

FREE
21" X 32"
Full Out™ Plans Inside!

Display until October 1

Popular Woodworking

Issue 56, September 1990

Toy Carousel • Piano Music Box • Country Mailbox • Drum Sander Dust Collector

Utility Serving Cart



Roadrunner Whirligig



...and lots more!



US \$3.95
Canada \$4.95



Angled
Finger Joints



IMPORTS, INC.

MUSCLES OUT THE COMPETITION

ORDER YOUR
FREE CATALOG
TODAY!



**6" x 47" HEAVY
DUTY JOINTER**
MODEL G1182
REG. \$375⁰⁰
SALE PRICE \$345⁰⁰

F.O.B. Bellingham, WA or Williamsport, PA



**6" x 48"
COMBINATION
SANDER**
MODEL G1014
ONLY \$195⁰⁰

F.O.B. Bellingham, WA or Williamsport, PA



1½ H.P. SHAPER
MODEL G1035
ONLY \$495⁰⁰

F.O.B. Bellingham, WA
or Williamsport, PA



15" PLANER
MODEL G1021
ONLY \$735⁰⁰

F.O.B. Bellingham, WA
or Williamsport, PA

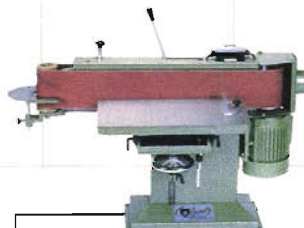


**SLOW-SPEED
GRINDER**
MODEL G1036
ONLY \$109⁹⁵



WOOD SHAPER
MODEL G1024
ONLY \$275⁰⁰

F.O.B. Bellingham, WA or Williamsport, PA



**6" x 30" EDGE
SANDER**
MODEL G1531
ONLY \$395⁰⁰

F.O.B. Bellingham, WA or Williamsport, PA



12" PLANER
MODEL G1017
ONLY \$375⁰⁰

F.O.B. Bellingham, WA
or Williamsport, PA



**SUPER HEAVY DUTY
TABLE SAW**
MODEL G1023
ONLY \$895⁰⁰

F.O.B. Bellingham, WA or Williamsport, PA



**10" HEAVY DUTY
TABLE SAW**
with Cast Iron Wings!
MODEL G1022
REG. \$365⁰⁰
SALE PRICE \$355⁰⁰

F.O.B. Bellingham, WA or Williamsport, PA



16" BANDSAW
MODEL G1538
ONLY \$525⁰⁰

F.O.B. Bellingham, WA or Williamsport, PA



20" PLANER
MODEL G1033
ONLY \$1,295⁰⁰

F.O.B. Bellingham, WA or Williamsport, PA



**2 H.P. DUST
COLLECTOR**
MODEL G1029
ONLY \$295⁰⁰

F.O.B. Bellingham, WA or Williamsport, PA

West of the Mississippi:

P.O. Box 2069
Bellingham, WA 98227
Customer Service: 206-647-0801

1-800-541-5537
(Orders Only)

East of the Mississippi:

2406 Reach Road
Williamsport, PA 17701
Customer Service: 717-326-3806

1-800-523-4777
(Orders Only)

OUR 13" PLANER ALWAYS HAD GUTS.



NOW IT HAS FREE WINGS AND LEGS.

Rugged cast iron throughout. Powered by either a 2HP single phase or 3HP three phase motor. The Delta 13" planer has the guts to tackle stock up to 13" wide and 5.9" thick.

This is the one you've wanted. And right now, we're giving you an extra incentive to buy it. We'll throw in our model 50-655 heavy gauge steel stand with table extension wings, for free (A \$214 value).*

Once it's in your shop you'll be feeding stock across a finely ground, stationary cast iron table. No bed rolls to contend with. No sniping. And you'll be precision planing down to 1/8" thickness if you so desire. Thanks to a unique cutterhead/feed assembly that raises or lowers to accommodate stock thickness.

Once you've seen the Delta 13" planer, with its free stand and table extension wings, the others won't have a leg to stand on.

Call toll free for the name of your participating Delta Distributor: Delta International Machinery Corp., 800/438-2486.

*Offer good only on purchases of DC-33 promotional models 22-667 and 22-669 from participating distributors in the continental U.S., Alaska and Hawaii from April 1 to February 28, 1991.



**Building
On Tradition**
DELTA
A Pentair Company

MEISEL HARDWARE SPECIALTIES WOODWORKERS HARDWARE

Country Yardsticks		
#8574 Yardstick	\$1.29/EA	#7226 3-1/2" \$2.00/10
Scroll Saw Plywood		#7280 2-1/2" \$1.90/10
3mm (1/8") x 2' x 2'		#7227 1-3/4" \$1.10/10
#8450	\$4.50/EA	
2-9 Sheets	\$3.50/EA	Birch Spindles
Cookie Jar w/Metal Lid		#S6 5-3/4" \$.75/EA
#8633 Plastic Jar 8"	\$3.99/EA	#S85 9" \$.99/EA
#8635 Metal Lid	\$1.59/EA	Galley Spindles
1/4" Basswood Boards		#S1 Birch 1-1/8" \$1.65/10
#7293 3-1/2" x 16 linear feet	\$13.95/EA	\$10.00/100
Basswood Glue-Ups		#S4 Birch 1-1/2" \$1.70/10
#8589 1/2" x 14" x 36"	\$10.95/EA	\$15.60/100
#8592 1-1/8" x 14" x 36"	\$15.50/EA	#S10AK 1-1/8" \$1.50/10
Birch Candle Cup		\$12.00/100
#CC1 1-1/2" \$2.90/10		#S40AK 1-1/2" \$2.40/10
	\$19.00/100	\$22.00/100
Lazy Susans		Lamp Socket
#LC3 3" \$1.95/EA		#940 Push Thru \$1.89/EA
#LC4 4" \$1.30/EA		#941 Turn Knob \$2.59/EA
#LC6 6" \$2.29/EA		Animal Eyes
Clipboard Clips		#8681 1-1/8" \$3.50/20
#L5 3" \$.79/EA		#8682 1-1/2" \$4.00/20
#ST6 6" \$.95/EA		Chair Back Spindle 21"
Saw Tooth Hangers		#8147 Spindle \$2.35/EA
#S59 1-5/8" \$4.17/100		Metal Pails 2-1/4"
Black Hammer		#8710 Red \$1.09/EA
Hinge w/Screws		#8711 Galvanized \$1.09/EA
#1730 \$1.76/2		Synthetic Sheep
	\$7.80/10	Wool 60" Wide
Brass Plated Hinges		#8904 Sheep Wool \$9.95/YD
#910 1" \$1.65/10		12 yards or more \$7.95/YD
#928 1-1/2" \$2.59/10		Wood Hearts
Screws for above		#7379 1" x 3/16" \$.59/10
#F125 #5 Fl. Hd. \$2.75/100		#7380 1" x 3/8" \$.79/10
Sanding Belt Cleaner 8"		#7381 1-3/8" x 1/2" \$.99/10
#1710 \$5.95/EA		#7461 3" x 3/8" \$3.75/10
Plastic Spoke Wheel 4"		Brass Bottle Opener
#1741 \$1.19/EA		#7641 \$3.89/EA
Metal Wheels		Grocery List Pad of 500
#1779 1-1/2" \$.720/10		#14P Buff Color \$7.99/EA
#1780 2" \$.940/10		#7430 Peach Color \$7.99/EA
		1" Grid Paper
		#8206 22" x 34" \$.89/Sheet

Send \$1.00 for catalog or \$5.00 for catalog plus Best Selling Plan Package (\$14.72 value) or order directly from this ad by phone or mail.

ADD SHIPPING & HANDLING:
Mail check or money order and include \$4.95 shipping & handling. MN res. add 6% tax. Alaska and Hawaii send \$10.95 p&h. Canada send \$16.95 (U.S.) p&h. We accept VISA or MC on orders over \$15.00.

MINIMUM ORDER OF \$15.00
ORDER TOLL FREE Charge Orders Only
1-800-441-9870

MEISEL HARDWARE SPECIALTIES
P.O. BOX 70C-9 MOUND, MN 55364

Popular Woodworking

Editorial Staff

David M. Camp *Editor*

Wien Chod *Managing Editor*

Phil Fischer *Associate Editor*

J. A. Newell *Editorial Assistant*

Contributing Editors

William H. McMaster

Alan Marks

Hugh Foster

John A. Nelson

Don Kinnaman

Peter Good

Art Department

Ginny Pruitt, Tom Larson

Circulation

Mary Goldthorpe, Suzanne Eriksen

Customer Service

May Fayne, Susannah Harte

Advertising

Debra Nowak *Advertising Manager*

1320 Galaxy Way

Concord, CA 94520

Tel. (415) 671-9852

Popular Woodworking (ISSN 0884-8823) is published bimonthly by EGW Publishing Co., 1320 Galaxy Way, Concord, CA 94520. Second-class postage paid at Concord, California and additional mailing offices. POSTMASTER: send address changes to *Popular Woodworking*, P. O. Box 58279, Boulder, CO 80322.

SUBSCRIPTIONS:

A year's subscription (6 issues) is \$23.70; two years' worth (12 issues) is \$47.40; outside of U.S.A. add \$6.00/year. Send all subscriptions to:

Popular Woodworking
P. O. Box 58279
Boulder, CO 80322

Please allow 6 to 8 weeks for delivery.

All rights reserved. Reproduction without prior permission is prohibited. Copyright ©1990 by EGW Publishing Co.

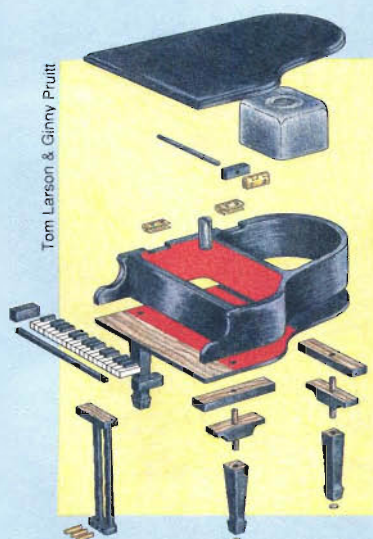
Unsolicited manuscripts, photographs, artwork and other materials are accepted, but *Popular Woodworking* cannot assume responsibility for these materials. Writers who submit articles do so with the understanding that the work is original and done by them. The author warrants that submissions and subsequent printing of any materials in *Popular Woodworking* magazine do not infringe upon the rights of any third party and agrees to be totally liable for such claims. Submissions must be accompanied by a self-addressed, stamped envelope for return. Address all editorial correspondence to: *Popular Woodworking*, 1320 Galaxy Way Concord, CA 94520.

The opinions expressed by the authors do not necessarily reflect the policy of *Popular Woodworking*. Editorial correspondence is encouraged, and may be edited for publication.

Advertisers and agencies assume complete liability for the copy in their advertisements and warrant that it does not infringe on the copyrights or trademarks of others. Advertisers and agencies agree to hold publisher harmless from any liabilities arising out of such infringement and to reimburse publisher for any and all expenses and costs incurred by publisher by reason of such infringement.

Produced and printed in the U.S.A.

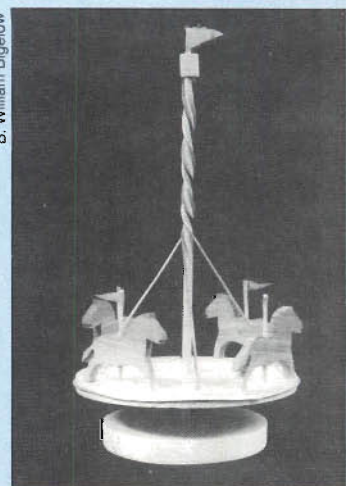
Contents



Tom Larson & Ginny Pruitt

55

B. William Bigelow



Phil Keller

68

On the Cover

Walter Rockholt of Home Repairs R Us in Vallejo, California chisels the waste from the sockets of angled finger joints. Not to be confused with dovetails, angled finger joints are similar to traditional finger (or "box") joints except that the bottoms of the sockets are angled to accommodate the unusual shape of Walter's "Art Deco Linen Cabinet." For the story of the making of this one-of-a-kind piece, and how it came to be turned upside-down, see the article on page 62.

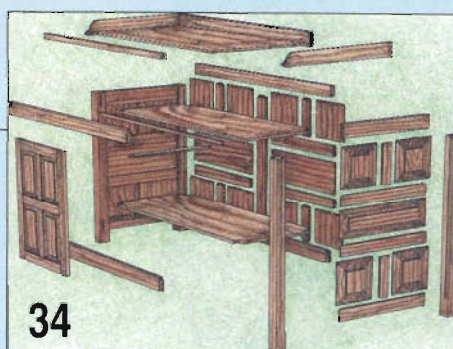


David M. Camp

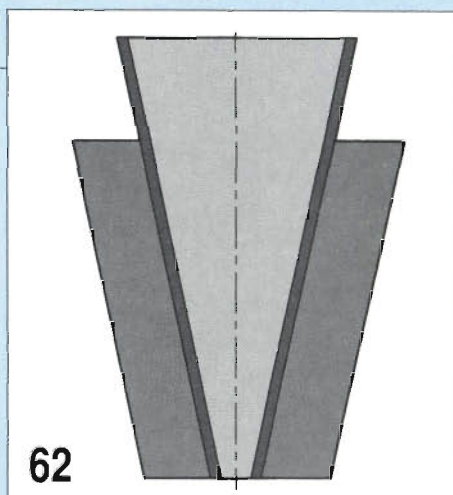
Make Your Own Custom Wood Filler <i>by Hugh Foster</i>	11
Woodworking in the Age of Stone <i>by Dennis Michael Morrison</i>	24
A Popular Woodworking Project— PullOut™ Plans Creative Log Turning <i>by Warren Asa and Ken Sadler</i>	26
A Popular Woodworking Project— PullOut™ Plans Roadrunner Whirligig <i>by John A. Nelson</i>	30
A Popular Woodworking Project Toy Carousel <i>by B. William Bigelow</i>	32
A Popular Woodworking Project Utility Serving Cart <i>by Hugh F. Williamson</i>	34
A Popular Woodworking Project— PullOut™ Plans Piano Music Box <i>by John A. Nelson</i>	55
Project for the Shop The Cube and Canister Drum Sanding System <i>by Dick Dorn</i>	58
A Popular Woodworking Project The Upside-Down Art Deco Linen Cabinet <i>by David M. Camp</i>	62
A Popular Woodworking Project— PullOut™ Plans Country Mailbox <i>by Phil Keller</i>	68
Focus on Carving Laminating Woodcarving Blocks <i>by William H. McMaster</i>	73
Tool Talk <i>by Sanford Wilk</i>	80
Wood Types Cherry <i>by Ken Textor</i>	88



Ken Sadler



Tom Larson & Ginny Pruitt



Tom Larson

Columns

The Business End	12
Videoscene	16
Tried And True	19
Out of the Woodwork	90

Departments

Letters	6
Tricks of the Trade	8
PW Showcase	76
Calendar	84
Classified	86
Index to Advertisers	87

Letters

We welcome your comments, pro or con, about articles we publish. Send your letters to: Editor, Popular Woodworking, 1320 Galaxy Way, Concord, CA 94520. Letters may be edited for publication.

A Designer is Born

I recently started subscribing to your magazine and find it very informative and more interesting to read than most magazines. I was especially interested in the "Design Your Own Furniture" article in the March Issue (PW #53).

After considerable thought, I sat down and sketched my idea for a night table. After a few adjustments, I drew it up on paper and figured in the measurements. Then with the few tools I have, I went at it and was successful in completing it.

For the top I used lap joints and rabbeted out the center for a plywood panel. Next I

I used poplar wood and sanded it till it was super smooth. Then I stained it walnut and put on an oil finish (1/3 turpentine and 2/3 boiled linseed oil).

I am sending some photos with this letter in the hope that you will give me an honest opinion of it.

Donald J. Lee
Cressona, PA

We like it! In fact, we think readers will too. We'd like you to write up plans and instructions so we can publish it in a future issue.

Editor

More to Adze

Readers whose interest in adzes was aroused by Warren Asa's recent article ("Making an Indian Adze," PW #54, May 1990) should know that adzes are still commonly used in Portugal. Anyone working with wood—carpenter or shipwright—is sure to have one in his toolbox. The Portuguese enxo (pronounced EN-shaw) has a

\$50.00 each which includes postage or UPS to anywhere in the US or Canada. For more information, write to me at 720 Bay Street, San Francisco, CA 94109, or call (415) 885-4183.

Simon Watts
San Francisco, CA

Metrically Opposed

In regard to Norman Chapin's letter in PW #54 requesting measurements in inches for William H. McMasters' Chief Joseph carving project (PW #51) I think the author's reply was patronizing, aggravating and demeaning. He lectures like a schoolmaster to a child. He should be aware that the English, who he says "have abandoned these units in favor of the metric system" are like the Americans in that their governments have tried to abandon inches, but the resistance of the people is high. There are many areas in England where the English system is alive and well.

Perhaps he has difficulty in math so the simplistic system is better for him. I've been working with wood for over 50

years and have had no difficulty in measuring—multiplying and dividing in inches. If McMaster prefers to use the metric system, that is his right, but he has no right to try to put down those of us who remain with the familiar and accurate English system.

R. G. Tremblay
Formoso, KS

To the woodcarving author who is in love with the metric system of measure-

ment: Begone!

Stop trying to sell us this system for anything more than solving physics problems. As for wood, please note that it still comes in eight, ten, twelve, fourteen, sixteen, and twenty-foot lengths—nary a meter among them. Plywood is 4' X 8', and they still frame houses on 16" centers. Roof pitches are in inches. So are all my wood bits. Concrete comes by the cubic yard.



cut four corner posts and 45-degreed them in the corners. The tricky part came in with the sides and the front, as I had to miter them to fit flush against the corner posts. After a lot of measuring and double-checking, I cut it on the table saw, and it worked out perfectly. The drawers I made the usual way, with rabbet and dado joints and 1/4" plywood for the bottoms and the back of the cabinet.

4" wide curved blade attached directly to a wood grip. The radius of curvature is about the same as the length of the human arm from elbow to hand. It is much easier to learn to use than its long-handled cousins—the shipwright's or railroad adze.

I got to like this tool so well that I decided to import a small quantity—the first shipment of 25 are on their way. Each tool comes with complete instructions for use, care and sharpening. They cost



As for your explanation of the beginning of the English system, it is true that at one time the yard was the distance from the tip of the king's nose to the tip of his outstretched arm, and a foot was the length of the king's foot. But is the metric system any purer? I think not. It was supposed to have been one ten-millionth of the distance measured along a meridian between the equator and the north pole. Then they found out that the world is not perfectly round after all, so the measurement had to be designated as the length between two marks on a bar in France, later to become 1,650,763.73 wavelengths of the orange/red radiation of Krypton 86. Personally, I'd just as soon go with the king's foot!

Years ago, Congress appointed a commission to investigate changing the United States over to the metric system. The attempt failed after several years of concerted effort. There are just too many shortcomings. For example, doesn't it sound better to say "first and ten" than "first and 9.144 meters?" and what do you do on the one-foot line, say "third down and 30.48 centimeters?"

Show me the woman who would want her figure described as "96.5—61—91.4" instead of "38—24—36." And what do you do with good old sayings such as "A miss is as good as a mile?" Say "A miss is as good as 1.6 kilometers?" Do you expect the fast-food people to change their "Quarter-Pounder" to your "113.636 GRAM-er?"

And finally, would you defame John Wayne's ten-gallon hat by calling it a "37.869822-liter hat...approximately?" Please don't.

Joe Mano
Rillito, AZ

Improved Toy Box/Chair

When I made the "Child's Toy Box/Chair" in the May issue (PW #54) I made it less "boxy-looking" by raising the bottom 5/8" and cutting out curved sections from the bottom ends of the sides to create 5/8" long legs at the corners. I think it looks much nicer that way. Try it and see.

Don Bowers
St. Johnsville, NY

Stool Questions

I have some problems with the details in Walt Panek's article "Making Windsor Stools" (PW #54). First, he does not say how deep to drill the holes through the seat for the legs. Secondly, if you turn the profile of his "Dream Reamer" as shown in the drawing, you will have already established the angle at the pointed end before hardening. So what does he mean, "Then grind the clearance angle on the end?"

Ray Routh
St. Louis, MO

It's very difficult to be specific about the depth of the holes in the seat because we're talking about a tapered hole. The largest diameter of the "reamer" is 1" and the largest diameter on the end of the leg is 1", so you don't want to go so deep that the leg can slip through the hole. As long as you don't go that deep, and if you taper the leg as shown in Figure 2, it doesn't matter how deep you drill—so long as you drill to the same depth for all three holes.

You're right about the 60° clearance angle; you shouldn't turn it at the same time you turn the rest of the reamer. You should just turn the taper, then harden and temper, and then grind the clearance angle, cooling frequently so you don't draw the temper.

Editor

Alternative "Reamer"

In Walt Panek's article on making Windsor stools, he told readers how to make a tapered reamer (he called it his "Chairmaker's Dreamer") to bore the tapered holes for the stool legs in the seat. I can appreciate the tool he manufactured on a metal lathe from a drill rod, but the average woodworker would probably never attempt to make this bit. Regrinding a spade bit is probably more practical for a "one-of" project, but it too has its drawbacks, as pointed out by Mr. Panek. What is the answer? Woodcraft Supply's Chairmaker's Tapered Spoon Bit!

This specialty bit is the same one used by generations of chairmakers in the United States and England. Used in a bit brace, the traditional spoon shape cannot be beat for cutting clean tapered holes for

leg tenons. The control you get by hand-boring is also a benefit that should not be overlooked. Any errors you may encounter in setting up a drill press jig are eliminated when you bore by eye. If you decide to change the angle of boring, this bit will allow you to do so as you work. It is a tool designed for a single purpose. Any woodworker who is going to make a Windsor-style chair or stool by hand should consider this bit for their shop. They're available from Woodcraft Supply Corporation, Box 4000, Dept. PW, Woburn, MA 01888.

David D. Draves
Woburn, MA

NEW! UNIQUE! AND TRULY PERSNIPPITY!

PERSNIPPITY WOOD OIL FINISH
DRY POWDER CONCENTRATE (1 LB. PINT)

"THE SECRET IS IN THE T.L.C."
• MIXES WITH ANY COOKING OIL!
(VEGETABLE, PEANUT, OLIVE, GRAPE SEED, SUNFLOWER, SAFFLOWER, YOU NAME IT!)

• Accepts lacquer, varnish, urethane, etc.
• UNLIMITED SHELF AND STORAGE LIFE!
• ECONOMICALLY NO WASTE: MIX AS MUCH OR AS LITTLE AS YOU NEED FOR JOB!
• IDEAL FOR HORRIBLES, ANTICQUES, TOUCH UPS AND QUALITIES
• QUICK AND EASY SOAP AND WATER WASH-UP!
• DOUBLE YOUR MONEY BACK GUARANTEE! IF FOR ANY REASON YOU ARE DISSATISFIED WITH PERSNIPPITY WOOD OIL FINISH PERFORMANCE, WE'LL HAPPILY REFUND YOUR ENTIRE MONEY BACK!

8 Beautiful Colors!

GALLON \$9.95
EQUIVALENT DRY POWDER CONCENTRATE
ADD \$1.50 POSTAGE AND HANDLING CHARGE RESIDUES PAID, ADD 7% S&H TAX

TO ORDER CALL: 619-433-3652
OR WRITE:
"TRULY PERSNIPPITY"
607 NORTH HORNE, OCEANSIDE, CA 92054

TRU-GRIP
WOODWORKING CLAMPS

CLAMP 'N TOOL GUIDE

ALL-IN-ONE...

- Bar Clamp
- Fence
- Straight Edge
- Power Tool Guide

As a FENCE or GUIDE, it attaches ten times faster than "C" clamping and won't surface mar wood. As a BAR CLAMP, the unique low profile jaws enable you to clamp butt-jointed corners (down to 1/2" material) and also allow edge clamping. These clamps always lay flat for easy assembly set-ups. World's fastest, most versatile bar clamp!

TWO SIZES AVAILABLE:

24" Grip	\$24.95
50" Grip (panel size)	\$34.95

ORDER TOLL-FREE!

1 800 428-3809 (Inside California)
1 800 228-1806 (Outside California)
Master Card, Visa, Check or Money Order In California, add 6% sales tax
WE PAY FREIGHT within Continental U.S.A.

Rodman
RODMAN & COMPANY, INC.

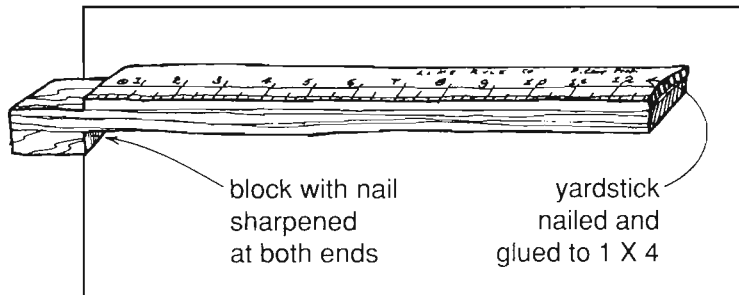
965 W. VENICE BLVD.
LOS ANGELES, CA 90015
(213) 749-6441

Tricks of the Trade

"Tricks of the Trade" shares readers' tips for making woodworking tasks easier and safer. If you've come up with a trick that would help other woodworkers, send it to "Tricks of the Trade," c/o Popular Woodworking, 1320 Galaxy Way, Concord, CA 94520. Include any photos or sketches that help illustrate your idea (we'll redraw them). We pay \$25 for each trick we publish.

Plywood Layout Sticks

Making lots of layouts on full sheets of plywood led me to make four-foot and eight-foot "yardsticks." Actually, they're straight 1 X 4's with yardsticks glued and nailed to the tops and a block on



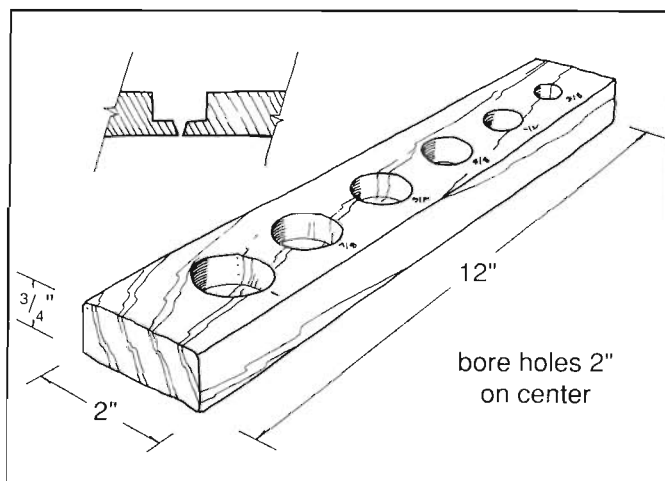
the underside at one end for hooking the edge of the plywood. I made one slightly more than four feet long and one slightly more than eight feet long. Line up the applied yardstick with the end of the block so that measuring begins from the edge of the plywood. A pin in the end of the block (made from a sharpened finishing nail) helps keep this layout tool from slipping.

Henry F. Ellis
Melbourne, FL

Dowel Rod Center Finder

Have you ever tried to find the exact center of a dowel end for drilling? This jig does just that. It's handy when you're making toy wheels. Make it from pine at least 3/4" thick, but a good solid piece of rock maple or birch will last longer. Bore the various holes with spade bits, but stop boring when the bit tip begins to break through beneath. The holes should bottom out about 1/8" from the underside. Carefully complete them with a 1/8" or smaller bit, large enough only for a pencil or awl point to mark through.

Don Kinnaman
Phoenix, Arizona



Rubber Pads for Clamp Jaws

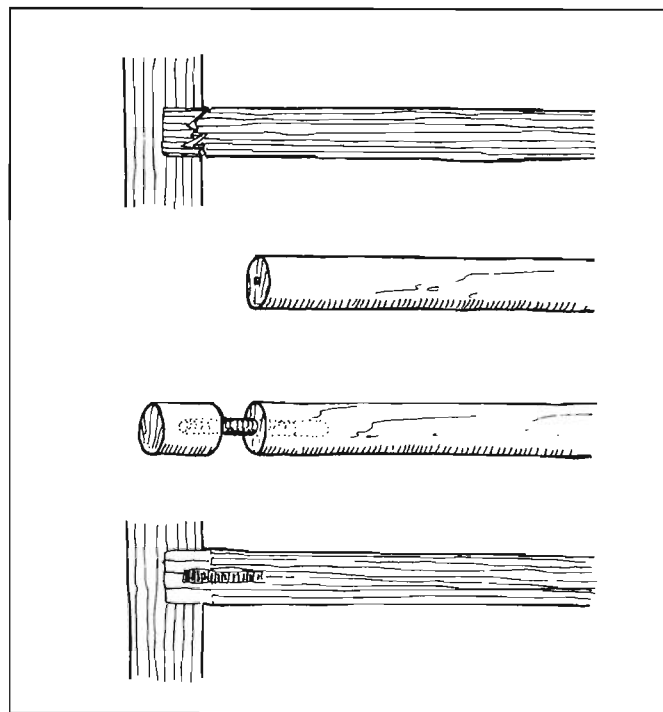
Protect your work by coating your clamp faces with a layer of rubber. I used a liquid rubber that is intended for the repair of athletic shoes. Hang the clamp in a vise and apply a liberal layer of liquid rubber to the lower clamp face. Spread it quickly and evenly with a stick, and allow it to cure fully. Hang the clamp by the opposite end and repeat the operation on the remaining clamp face. One tube of liquid rubber will coat many clamp faces.

Richard H. Dorn
Oelwein, IA

Replacing A Chair Rung

If you'd rather not replace a broken part on a valuable antique with a new one, you may be able to repair it following this method. If the rung has broken at the point of entry into the leg, (so that the tenon is stuck in the mortise) carefully remove the rung from the opposite leg and bore out the broken end. Now trim the rung's broken end off square, and using a V center finder or a pair of dividers, find the exact center of each end of the broken rung. Mark the point with a center punch or awl.

Place a drill chuck in the headstock of your lathe and mount

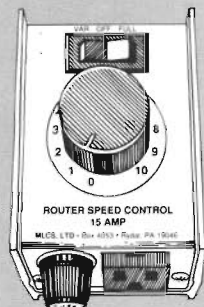


a 3/16" twist bit. Place the opposite end of the rung against the tailstock and, holding the rung with one hand, turn the tailstock ram to push the rung into the drill bit precisely on center. Drill about 1-1/2" deep in the broken end. Screw a threaded steel rod or hanger bolt into the hole with pliers. Now cut a piece of dowel rod the same length and diameter as the broken rung end, drill dead center through its length, and thread and glue it onto the opposite end of the steel rod. Reassemble the chair with glue and clamps. The steel rod is completely hidden, and the value of the antique is preserved by using the old part for the repair.

Don Kinnaman
Phoenix, Arizona

MLCS Ltd.

CONTROL THE SPEED OF YOUR ROUTER - ROUT AT THE SPEED THAT GIVES THE BEST RESULTS WITH THE WOOD AND BIT YOU ARE USING!



NOW ONLY \$39.95 Order Item #200

FEATURES:

- Speed Adjustable from Full Speed to 0 RPM
- Full Horsepower and Torque at All Speeds
- Go Back and Forth from Any Pre-Set Speed to Full Speed at the Flip of a Switch
- Works with All Routers 3 1/4 HP or Less
- 120V 15 Amp
- Gives Your Router a Feature Only Available on Routers Costing Hundreds of Dollars!

- Less Tear Out
- Stops Burning
- Feed at Comfortable Rate
- Better, Safer Results with Large Diameter Bits
- Less Wear on Bits
- Less Noise and Softer Starts at Lower Speeds

EASY TO USE - Simply plug in Speed Control and plug your router into the Speed Control - turn dial for best results. (Speed Control has a clip that can be worn on your belt or hung on wall or left loose.)

• Reduces speed electronically without reducing torque; electronic feed-back maintains speed by increasing voltage to motor as load increases.

CARBIDE TIPPED ROUTER BITS PROFESSIONAL PRODUCTION QUALITY GUARANTEED WHEN ORDERING ANY THREE OR MORE DEDUCT \$1.00 EACH. ALL PRICES ARE POSTAGE PAID

ITEM NO.	BEST CUT BEST PRICE	DESCRIPTION	ANGLE/DEPTH/RADIUS CIRCLE DIAMETER	LARGE DIA.	CUTTING LENGTH	SHANK SIZE	PRICE
#490		1 1/4" Classical	3/16" R	1 1/4"	5/8"	1/4"	\$22.50
#491		1 1/2" Classical	1/4" R	1 1/2"	3/4"	1/4"	\$25.00
#792		1 1/2" Classical	1/4" R	1 1/2"	7/8"	1/2"	\$25.00
#231		5/32" Roman Ogee	5/32" R	1 1/4"	1 1/2"	1/4"	\$17.00
#232		1/4" Roman Ogee	1/4" R	1 1/2"	3/4"	1/4"	\$18.00
#661		1/4" Roman Ogee	1/4" R	1 1/2"	3/4"	1/2"	\$21.00
#340		1/8" Cove	1/8" R	5/8"	3/8"	1/4"	\$12.00
#341		1/4" Cove	1/4" R	1"	1 1/2"	1/4"	\$13.00
#342		3/8" Cove	3/8" R	1 1/4"	9/16"	1/4"	\$14.00
#343		1/2" Cove	1/2" R	1 1/2"	5/8"	1/4"	\$15.00
#644		3/4" Cove	3/4" R	1 7/8"	3/4"	1/2"	\$28.00
#350		1/8" Round Over	1/8" R	3/4"	3/8"	1/4"	\$11.00
#351		3/16" Round Over	3/16" R	7/8"	1/2"	1/4"	\$11.00
#230		1/4" Round Over	1/4" R	1"	1 1/2"	1/4"	\$12.00
#353		5/16" Round Over	5/16" R	1 1/8"	1 1/2"	1/4"	\$14.00
#354		3/8" Round Over	3/8" R	1 1/4"	5/8"	1/4"	\$15.50
#355		1/2" Round Over	1/2" R	1 1/2"	3/4"	1/4"	\$17.00
#656		3/4" Round Over	3/4" R	2"	7/8"	1/2"	\$21.00
#370		3/8" Rabbeting	3/8" Deep	1 1/4"	1 1/2"	1/4"	\$14.00
#670		3/8" Rabbeting	3/8" Deep	1 1/4"	1 1/2"	1/2"	\$14.00
#366		1/8" Slot Cutter	3/8" Deep	1 1/4"	1/8"	1/4"	\$14.00
#368		1/4" Slot Cutter	3/8" Deep	1 1/4"	1/4"	1/4"	\$14.00
#403		3/8" Dovetail	9 degree	3/8"	3/8"	1/4"	\$ 7.50
#405		1/2" Dovetail	14 degree	1/2"	1 1/2"	1/4"	\$ 8.50
#409		3/4" Dovetail	14 degree	3/4"	7/8"	1/4"	\$10.50
#709		3/4" Dovetail	14 degree	3/4"	7/8"	1/2"	\$10.50
#402		3/8" Dovetail	8 degree Leigh	3/8"	1 1/2"	1/4"	\$12.00
#404		1/2" Dovetail	8 degree Leigh	1/2"	1 3/8"	1/4"	\$12.00
#708		1 1/8" Dovetail	8 degree Jigs	1 1/8"	1"	1/2"	\$14.00

ITEM NO.	BEST CUT BEST PRICE	DESCRIPTION	ANGLE/DEPTH/RADIUS CIRCLE DIAMETER	LARGE DIA.	CUTTING LENGTH	SHANK SIZE	PRICE
#415		1/4" Core Box	round nose	1/4"	1/4"	1/4"	\$10.00
#416		3/8" Core Box	round nose	3/8"	3/8"	1/4"	\$11.00
#417		1/2" Core Box	round nose	1/2"	1 1/2"	1/4"	\$14.00
#418		3/4" Core Box	round nose	3/4"	5/8"	1/4"	\$15.00
#719		1" Core Box	round nose	1"	3/4"	1/2"	\$18.00
#470		1/4" Straight	plunge cutting	1/4"	3/4"	1/4"	\$ 7.00
#471		5/16" Straight	plunge cutting	5/16"	1"	1/4"	\$ 7.00
#472		3/8" Straight	plunge cutting	3/8"	1"	1/4"	\$ 7.00
#473		7/16" Straight	plunge cutting	7/16"	1"	1/4"	\$ 7.00
#474		1/2" Straight	plunge cutting	1/2"	1"	1/4"	\$ 7.00
#775		1/2" Straight	plunge cutting	1/2"	2"	1/2"	\$14.00
#478		5/8" Straight	plunge cutting	5/8"	1"	1/4"	\$ 8.00
#479		3/4" Straight	plunge cutting	3/4"	1"	1/4"	\$10.00
#781		1" Straight	plunge cutting	1"	1 1/2"	1/2"	\$12.00
#500		3/8" Flush	Trimming	3/8"	1/2"	1/4"	\$ 7.00
#502		1/2" Flush	Trimming	1/2"	1/2"	1/4"	\$ 7.50
#503		1/2" Flush	Trimming	1/2"	1"	1/4"	\$ 8.50
#804		1/2" Flush	Trimming	1/2"	1 3/8"	1/2"	\$ 9.00
#545		Tongue & Groove	Straight	1 5/8"	1"	1/4"	\$29.00
#845		Tongue & Groove	Straight	1 5/8"	1"	1/2"	\$29.00
#546		Tongue & Groove	Wedge	1 5/8"	1"	1/4"	\$29.00
#846		Tongue & Groove	Wedge	1 5/8"	1"	1/2"	\$29.00
#450		1/8" Beading	1/8" R	3/4"	3/8"	1/4"	\$11.00
#451		3/16" Beading	3/16" R	7/8"	1/2"	1/4"	\$11.00
#233		1/4" Beading	1/4" R	1"	1 1/2"	1/4"	\$13.00
#453		5/16" Beading	5/16" R	1 1/8"	1 1/2"	1/4"	\$14.00
#454		3/8" Beading	3/8" R	1 1/4"	5/8"	1/4"	\$15.50
#455		1/2" Beading	1/2" R	1 1/2"	3/4"	1/4"	\$17.00
#375		45 degree Chamfer	45 degree	1 1/2"	5/8"	1/4"	\$15.00
#676		45 degree Chamfer	45 degree	1 7/8"	7/8"	1/2"	\$23.00

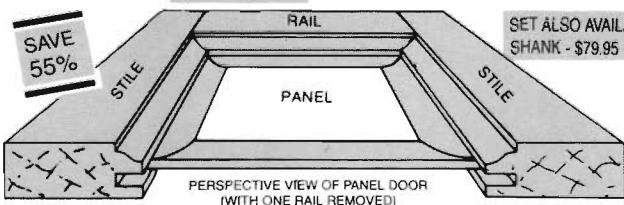
New 24-page catalogue now available, featuring hundreds of bits.

MAKE BEAUTIFUL RAISED PANEL DOORS . . . WITH YOUR 1/4" ROUTER!

Professional production quality bit makes 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.

SALE PRICE **\$69.95** Regular value Over \$150.00 FOR COMPLETE SET

ORDER ITEM # 554 for 1/4" Shank Set (Includes all bits shown below)



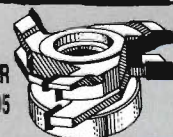
SET ALSO AVAILABLE IN 1/2" SHANK - \$79.95 - Item #852

RAISED PANEL BIT SUPPLIED WITH BALL BEARING

CARBIDE TIPPED 1/4" Shank

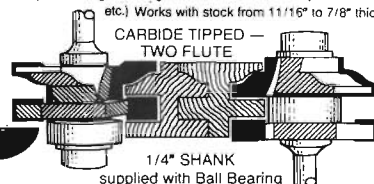


RAIL & STILE SHAPER CUTTER Item #150 - \$49.95



REVERSIBLE COMBINATION RAIL and STILE BIT

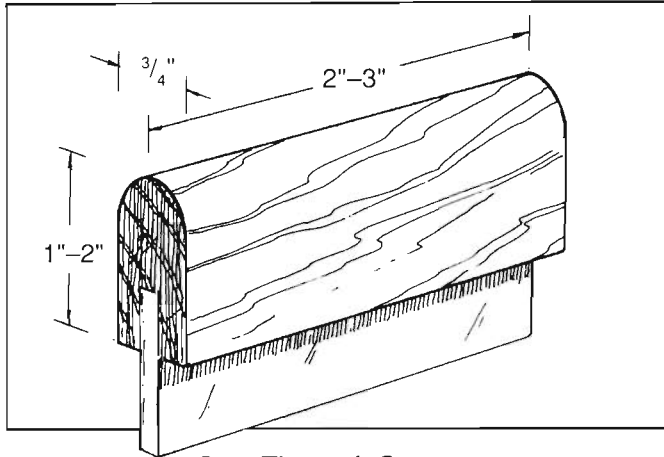
(For making matching rails and stiles in raised panel doors, etc.) Works with stock from 1 1/16" to 7/8" thick



To order by Master Charge or Visa Call Toll Free, 7 Day - 24 Hour Order Service, 1-800-533-9298 or send check to: MLCS Ltd., P. O. Box 4053PF, Rydal, PA 19046

©1990

Tricks of the Trade



See-Through Scraper

One of the best scrapers for woodworking can be a strip of window, crystal or plate glass which is thrown away by glass cutters. Make a simple holder from wood to contain the glass strip, and discard the glass when it becomes dull.

Don Kinnaman
Phoenix, Arizona

Reverse Handscrew

You can modify an old wooden parallel clamp so that it will pry, wedge, jack or press—exerting force outward rather than inward. First you must dismantle the clamp. File off the head of the steel pins holding each handle on and drive them out. The handle will then unscrew from the threaded rod. Save all the parts. Clean the jaws and the threaded rods with a wire brush. Reassemble the clamp, but with the original arrangement of wooden jaws reversed, and the two sets of threaded screws, handles and nuts switched. When you put back the pins, use a little epoxy glue. Now drill a hole as shown in the drawing for a rod to help stabilize

the clamp when it's used as a press. A short piece of dowel, sanded so it slides in the holes, makes the stabilizer rod.

Often the clamp jaws won't reach out far enough to serve as a press. In such situations, you can adapt sticks to serve as extension push rods as shown in the drawing.

Dick Dorn
Oelwein, Iowa

Using the Miter Gauge to Cut Wide Panels

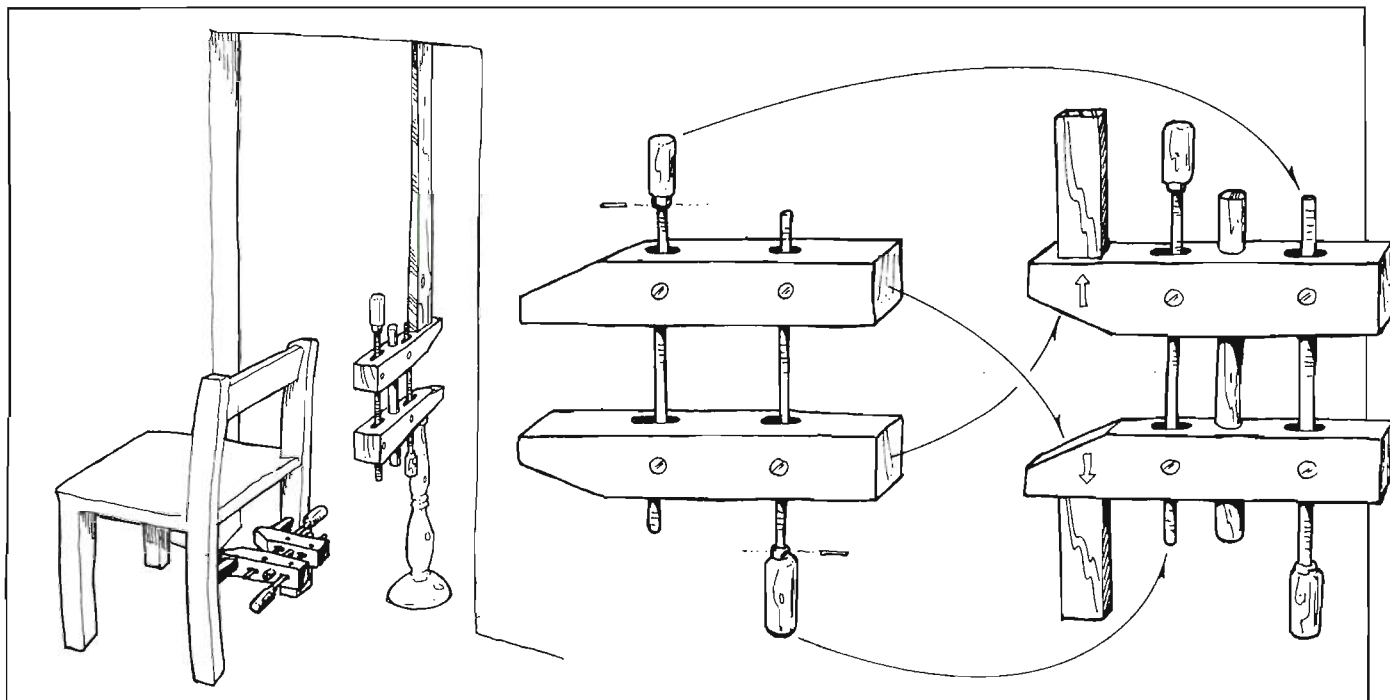
Wide panels can be hard to handle on the table saw with the miter gauge in its normal cutoff position. An often overlooked old trick is to turn the miter gauge around end for end and push the panel against the "backward" miter gauge through the sawblade. The panel is usually a lot easier to control than with the conventional method.

Don Kinnaman
Phoenix, AZ

Make Your Own Veneer

Do you have a board surface you wish you could use over and over again? You can! First surface plane both sides of the board and resaw once to obtain a 3/16" thick piece. Then surface plane the resawn surface of the board to get it smooth again. Resaw again, and repeat the steps until the board is used up. To surface the rough side of the veneer, attach it to a piece of wood that is smooth on both sides and at least as long and as wide as your veneer. Place a strip of double-sided masking tape at the leading edge of the carrier board, and put the smooth side of the veneer down on the tape to secure it. Now run the veneer and the carrier board through the surface planer, taking very shallow cuts. If you're making several strips of veneer, make sure you run them all through before changing the planer depth settings.

C. E. Rannefeld
Decatur, Alabama



Custom Wood Filler

By Hugh Foster

Even the best planks you're likely to find will have minor imperfections in them. As the cost of hardwoods continues to rise, cutting around these flaws can get expensive, and artful patching becomes more and more desirable. Stick shellac is good, but it's also fragile and never quite the right color—and blending tones can be messy, time-consuming, and not very precise. None of the various wood dough, putty or "plastic wood" products is suitable for more than the most ordinary applications. They, too, have color matching problems, and like the shellac sticks, they don't take finish in quite the same way as the surrounding wood. If a superior, readily available alternative were available, you'd think someone would have made a (woodworker's) fortune with it—but no one has.

What would you say if I told you that you already have the key ingredients to a superior wood patching compound in your shop, that it'll always match your project perfectly, and always be fresh because you make it up only as you need it? Master woodcarver Chris Effrem showed me the trick he called "scrape" a decade ago, and I've used it ever since, never failing to get superior results. Let me show you how.

The materials are simple—two ingredients and a single tool. Buy a small bottle of liquid hide glue. This works better than does the hot hide glue you might make from crystals and water, for it sets more slowly. Buy small bottles so that you work with fresh glue more often. That's all you need to buy, for the other ingredient is the cut-off from the board that requires patching. (By all means, experiment with the hot hide glue for those applications where you're really pressed for time; it'll work just fine if you really hustle.)

Position the cut-off end grain up in your bench vise. Put a drop of liquid hide glue on the end grain. With a very sharp chisel—but not one of your best—scrape the end grain through the glue with strokes a couple of inches long. Alter your scraping strokes enough to mix thoroughly the fine shavings you raise with the glue. When the mixture of glue and "dust" reaches the texture your experimenting tells you is most useful, apply it to the damaged area with the chisel. I find that I get best results when I blend the "scrape" so that it's somewhat thicker than commercial wood dough.

After the glue has set, the filler will sand and finish nicely. Hide glue does less to prevent the finish from working than do the more common PVA (white) or aliphatic resin (yellow) woodworking glues. Some woodworkers use white glue and the contents of their belt sander's dust bag. But the dust includes abrasive particles that are sure to ruin your finish, and unless your clean-up is absolutely meticulous, the white glue will show up under almost any finish. Besides, the micro-thin "scraped" shavings are the perfect consistency for this application. **PW**

Hugh Foster is a part-time furniture designer/builder in Manitowoc, Wisconsin and the author of *The Biscuit Joiner Handbook* (Sterling Publishing Co., 387 Park Avenue South, New York, NY 10016).



The glue, chisel, and the scrap of wood positioned in the vise, ready for "scraping."



Put a single drop of liquid hide glue on the end grain. After scraping, apply the glue to the flawed area with the chisel.



What Makes a Shop Run?

Being a carpenter doesn't make you a contractor and running machines and making things doesn't make you a manufacturer. The difference is having the ability and the know-how to run a business. The ability you'll have to determine for yourself, but the know-how can be passed along. This column is about one aspect of that know-how that is separate from such things as marketing, selling, accounting, record keeping, and financial affairs: managing the shop operation.

I'm going to discuss the different operating methods required for two basic types of woodworking businesses. The first is a semi-production shop, one that makes pieces in small quantities varying from five to one hundred. The other is the independ-

Ken Sadler is a retired furnituremaker in Portland, Oregon.

ent craftsman making one-of-a-kind pieces either by himself or with one or two helpers. There are six major elements to consider for successfully managing the operation of any woodworking business: equipment, layout, buying materials, planning, operating techniques, and labor.

Equipment and Layout for the Semi-Production Shop

Every shop should have certain basic tools; a 10" table saw, a 6" or 8" jointer, and a 15" drill press are the essential pieces of major equipment for any woodworking shop. As for power hand tools, a circular saw, a 3/8" drill, an oscillating sander, and a router make up my list. If you are doing a lot of cutting of irregular shapes, then add a 14" band saw to the first group or possibly a hand-held jigsaw. If some item you're making absolutely requires some other piece of equipment in order to pro-

duce it, then unless you can produce and sell that item in sizeable volume, you should think twice before undertaking it. This leads to the most important rule about buying equipment: never buy a piece of equipment unless you can justify its purchase in both time and money. This is particularly true if you're short on working capital. If you won't use the tool very often, find some way to do the operation with the tools you have, even if it takes more time. When you're short on money, it's better to spend time than money.

While we're talking about tools, let's talk about quality. A cheap tool is the most expensive tool you can buy. It won't do accurate work, and you'll create many rejects and spend much time readjusting setups. In the end the lost pieces and lost production time will cost you more than the added cost of quality tools. Look for quality



EVERLAST
SAW & CARBIDE TOOLS, INC.

1406 Utica Ave. • Brooklyn, NY 11203
1-800-TCT-SAWS (718) 968-8500
CA 1-800-221 SAWS FAX (718) 629-3652

STELLAR QUALITY BLADES with a super-smooth cut, created for you—the professional woodworker or craftsman.

Designed to cut aluminum, Corian, laminate, wood or any difficult material with ease.

Our complete line of innovative products is as close as your nearest distributor. Call or write for our complete catalog with safety guide and technical information, or call our professional staff for the technical assistance anytime.

"THE MADE IN AMERICA BLADE"
SAN FRANCISCO • NEW YORK

CASCADE TOOLS, INC.

P.O. Box 3110, Bellingham, WA 98227 90C-110

Finest Quality Carbide-Tipped Router Bits

DOUBLE-FLUTED Straight



1/4" SHANK		
PART NO.	D	PRICE
C1001	1/4	\$6
C1002	5/16	\$6
C1003	3/8	\$6
C1004	1/2	\$8
C1005	5/8	\$10
C1006	3/4	\$10
C1007	1	\$12

1/2" SHANK		
PART NO.	D	PRICE
C1008	1/4	\$6
C1009	5/16	\$6
C1010	3/8	\$6
C1011	1/2	\$8
C1012	1/2	\$15
C1013	5/8	\$10
C1014	5/8	\$15
C1015	3/4	\$10
C1016	3/4	\$15
C1017	1	\$12
C1018	1-1/4	\$12
C1019	1-3/8	\$15
C1021	1-5/8	\$18

ROUNDROVER



1/4" SHANK		
PART NO.	A	PRICE
C1174	1/16 R	\$11
C1175	1/8 R	\$11
C1176	3/16 R	\$11
C1177	1/4 R	\$12
C1178	5/16 R	\$13
C1179	3/8 R	\$15
C1180	1/2 R	\$16

1/2" SHANK		
PART NO.	D	PRICE
C1187	1/2 R	\$16
C1188	5/8 R	\$20
C1189	3/4 R	\$20
C1190	7/8 R	\$34
C1191	1 R	\$34
C1192	1-1/4 R	\$40

DOVETAIL



1/4" SHANK		
PART NO.	D	PRICE
C1067	1/4	\$7
C1068	3/8	\$7
C1069	1/2	\$7
C1070	9/16	\$8
C1071	3/4	\$9

1/2" SHANK		
PART NO.	D	PRICE
C1074	1/2	\$7
C1076	3/4	\$9
C1077	1	\$12

COVE



1/4" SHANK		
PART NO.	A	PRICE
C1138	1/16 R	\$12
C1139	1/8 R	\$12
C1140	3/16 R	\$12
C1141	1/4 R	\$13
C1142	5/16 R	\$14
C1143	3/8 R	\$15
C1144	1/2 R	\$16

1/2" SHANK		
PART NO.	D	PRICE
C1187	1/2 R	\$16
C1188	5/8 R	\$20

ORDER TOLL FREE 1-800-235-0272

MasterCard VISA

in such areas as design simplicity, motor power and overall weight—not necessarily in fancy features and add-ons you don't really need.

Shop layout is one of the most neglected considerations in small manufacturing operations. Unfortunately, it's also one of the most important from the standpoint of efficient operation. Smooth flow of work in process—from material storage to finished product—is the key to efficient, economical production. The ideal flow pattern is in the form of a "U," up one side, across the end, and down the other side. This leaves the middle for the movement and temporary storage of work in process. When shops are small or the work areas poorly arranged, this is often not possible and you'll have to compromise. You want to avoid continually reversing direction—one end for this operation and the other end for the next, and so on.

Work in process should be moved about on four wheel carts. There must be room by each machine for at least two of these, an in cart and an out cart, and they must not crowd the operator. There must also be space to freely move these carts from one machine to another. The assembly area will need more space than the machine area if only because there will be more carts to accommodate. The assembly station should also be arranged so that the workman does not have to move around very much; all parts should be within easy reach. Finishing and shipping areas should be closed off from the rest of the shop.

An easy way to work all this out and avoid major mistakes is to draw your shop floor plan to scale (1/4" or 1/2" scale are best). Make a template of each piece of equipment—including carts—to the same scale, and plan your layout on the drawing board.

Purchasing Materials

In a production shop, wood, hardware and finishing materials are a major part of the cost of the product. In fact, they're usually about 1/3 and can run much higher unless you're careful. That's why careful attention to the buying process will pay big dividends. By planning ahead, it's often possible to buy in large quantities and take advantage of quantity price breaks. (Of

course, this presupposes that you have the money to do this—another important reason to hoard your working capital and not tie it up in equipment you don't need.)

The other vital aspect of buying concerns the vendors. Try to have at least two sources for everything you buy. Set up a file card for each item. List the vendors, noting each time you buy the item, from whom, and what you paid for it. In this way

you will always stay on top of your material costs and be able to buy from the source with the lowest price. You will also be able to adjust your prices to offset increases in material costs. If you incorporate this system with cards showing a running inventory of each item, you'll have a simple but excellent purchasing and inventory control system.

Be sure you're buying at the wholesale



You can even feel the beauty
of a Watco finish.



Watco doesn't hide wood's natural beauty behind a plastic coat that can crack, chip, and peel. Watco Danish Oil Finish penetrates deep into wood pores, to harden and protect from within. With one easy step, you'll get a professional hand-rubbed look—in natural and nine rich colors. Discover Watco. And rediscover the natural look and feel of your wood. **WATCO**

PROTECTS FROM WITHIN

For FREE "How To" Booklet, write: Watco, P.O. Box 426W,
Little Falls, NJ 07424 Dept. PW109

The Business End

level, and try to set up 30-day open accounts with all your vendors. You'll never establish a credit rating by paying cash.

While talking about buying, we should also talk about storage. Whatever quantities you buy in, a sufficiently large, neatly kept storage area is essential. Having to move two or three items to get at the one you want is sloppy. In this kind of atmosphere, you lose things and seldom know how much you have on hand.

Planning and Operating Techniques

Planning requires knowledge of your inventories and material delivery schedule, your manufacturing methods, your orders on hand, and your promised delivery dates. Use this knowledge to work out a schedule that will be the most efficient and economical, and allow you to meet your commitments. This boils down to deciding which items to make when, and in what quantities. The answers will govern your entire operation from buying to shipping.

As an example, think about your orders on hand. Are the quantities of each product sufficient to make an economical run? If not, is the product selling well enough that you can anticipate future orders and increase the run to an economical size? Do you have enough material on hand to do the job, or will you have to order more? If so, again, will the orders on hand allow a proper quantity buy or should you anticipate future orders in order to buy enough to get the discounts you need? What is your cash situation at the moment? Can you cover what you plan, or should you call on your line of credit for a short term loan? Is it better to move the parts for several different products along together, so that you can spend more time on one machine and minimize setup changes? Or is it better to run through, from start to finish, the parts for one product at a time?

Much time and money can be saved by the judicious development of templates, jigs, fixtures, and special methods for processing the various parts of the products you make. When considering how you are going to make these parts, study the tools you have (not the ones you wish you had). Figure out how, with the help of

a jig or fixture, you can use those tools to do the needed operations, keeping in mind that you're going to build those jigs yourself, mostly from wood. The walls of my shop are covered with such jigs and fixtures. Some are used very seldom, others all the time. I used mostly scrap wood and built them myself so that their cost was insignificant compared to what they saved me. Each one was a challenge, an exercise in imagination and ingenuity. I have no special machines in my shop, just the few standard ones I mentioned above, but I can do some very special kinds of work because of the jigs and fixtures I have created.

Just for fun, here's a problem for you: figure out how to cut both cheeks of a tenon at the same time on a 10" table saw. I'll give you a hint: it takes two dado blades, an auxiliary rip fence, a special insert in the table, and a fixture for holding the piece while cutting it. Everything but the dado blades was made in my shop from wood. For a small shop with small lots, it does the work of a large, expensive tenoner for peanuts.

For any part that has an irregular shape, a template is essential because it saves huge amounts of layout time. You can use it to determine how many parts you can cut out of a given board with the least amount of waste—a very important point considering the cost of some woods.

Now that it's been mentioned, let's talk about waste for a bit. In some shops I've seen many board feet of perfectly good wood on the scrap pile. Such waste is criminal, when a little time spent with a pencil and paper would turn it to productive use. What is waste in the making of one item can make a part, or sometimes several parts, in another item. It just takes a little time and effort, but it can make the difference between large profit or small profit or maybe no profit at all.

Hiring Labor

The biggest drawback to hiring help is its cost. By the time you pay a decent wage, then add on social security, workmen's compensation, and unemployment compensation, you get an hourly rate that's tough to handle. I have a friend who makes fancy boxes which he

sells nationally through gift shops. He and his wife do all the work and his gross sales run well into six figures. He got tired of sanding and decided to hire someone to do it for him, 20 hours a week. He paid the helper slightly over minimum wage. He discovered, to his chagrin, that he had to increase his sales by \$20,000 a year just to pay for the helper. He's once again doing his own sanding. If he had spent some time with a calculator before he hired the helper, he would have saved himself trouble and money to boot. The bottom line today has to be, don't hire anyone you can possibly do without.

The One-of-a-Kind Shop

In the one-of-a-kind shop, things are run on an entirely different basis. It's more like an artist's studio. You're usually doing one project at a time, and everything is concentrated on that project. This is particularly true of sculpture or carving. In the custom furniture business, the project might call for multiples of the same piece, such as a set of dining room chairs. But overall, the problems of production don't exist.

There are, however, some of the same elements to be concerned about. It's even more important in this kind of a shop not to over-equip yourself. The basic list of power tools I gave for the production shop is entirely ample here. The hand tool category is different. There are numerous hand tools that you will need that are never needed in the production shop. Just be cautious; don't buy until you really need it. One piece of equipment you do need is a large and very well built workbench with a superior quick-acting vice. Next to the table saw, this is the most important tool in the shop.

The question of tool quality is even more important here. High quality hand tools are a must. Cheap cutting tools don't hold their edge, and you spend more time sharpening than working. A cheap hand plane is worse than useless; it can put a surface on a board that will cause you hours of extra sanding.

The layout of the one-of-a-kind shop can be very flexible. My own experience indicates several important points. You should allow considerable open space so you'll have room to assemble large pieces

and a place to set aside subassemblies while working on some other part of the project. Place your workbench where it gets good light from several different angles and has considerable free space at each end. The only other tool that needs lots of clear space around it (at least at and above its table height) is the table saw. It's also nice to have a lot of blank wall space on which to hang tools, jigs, and fixtures.

Buying materials is not as important here as in the production shop. The cost of materials rarely exceeds 10% of the price of the piece, and as you're able to increase your prices, that percentage goes down. The one important consideration is to have a sufficient supply of lumber readily available so as not to have to delay a project. You should also be sure that you've ordered any special hardware you may need far enough in advance so that it will be there when you need it.

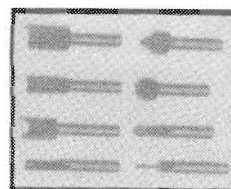
In terms of planning, you should approach your work in such a way that you'll have something to do while the glue job

you've just completed or the finish coat you've just applied dries.

To me the most important part of shop operation, other than doing the work, is keeping a neat, clean shop. You can't do good work in a grubby atmosphere and the clients who come to see you will judge your work by what they see—sloppy shop, sloppy work.

Experience has shown me that it's useless to hire help in this kind of a shop except perhaps to do sanding or some kinds of finishing. You spend more time showing the help how to do things the way you want them done than it takes to do it yourself. As for the sanding and finishing, the cost gets out of hand because it's hard to keep a person busy for even a day at a time.

I've tried to cover the important aspects of running two types of small woodworking shops. If there's one axiom that covers it all, it's this: "It's not what you take in that counts, but how much of it you keep." If you have questions or want further details, please write; I'll try to answer. **PW**



*the
Fine
Tool
Shops*

8-PIECE ROUTER BIT SET

Carbide bits can take a bite out of your wallet, but this 8-piece set is an excellent value. Price includes shipping and handling. **200-3000**

- 1/8", 1/4", 3/8", 1/2" Straight Bits
- 1/4", 1/2" Cove Box Bits
- 1/4" Shanks, Vinyl Case
- 1/2" Bottoming Bit
- 1/2" V-Bit

\$10.99

INCLUDES SHIPPING

Ordering Information:

1-800-533-5305

☐ Mastercard ☐ Visa ☐ Amex

Card No. _____ Expires _____

OR send \$10.99 to:

The Fine Tool Shops

P.O. Box 7091-W2
Portsmouth, NH 03802

Name _____

Address _____

City _____ State _____ Zip _____

Daytime Phone _____

FREE CATALOG with your order or check here for catalog only. ☐

FORSTNER BIT AMAZING OFFER!

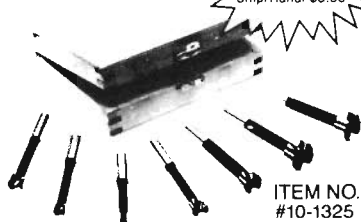
Quality, imported Forstner Bits make glass smooth, flat bottom, clean holes, even through veneer, knots and end grain, in any direction. Indispensable for furniture making. Will bore any arc of a circle, make pocket and blind holes and even make overlapping holes for mortising.

7-pc Set

1/4" to 1" in wood case

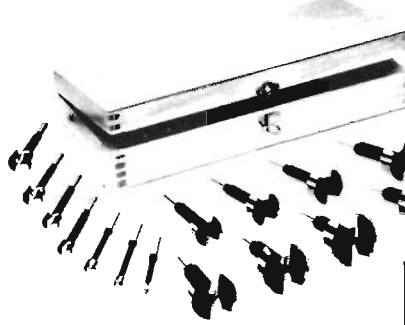
ONLY \$34.99

Ship/Handl \$3.00



ITEM NO. #10-1325

- Precision Ground, Quality Bits
- Machined from High-Carbon Steel
- Hardened to HRC 50-52
- Reusable Moulded Covers Protect Rims



COMPLETE 16-pc Set

1/4" to 2 1/8" in wood case

ONLY \$89.99

Ship/Handl \$5.00

ITEM NO. #10-1330

- Wood Storage Box Included
- 3/8" shanks

For a **FREE price list** of individual Forstner Bits, and other wood working tools, send your name and address to: **Dollar Trading Corp.**
PO Box 964
Ridgefield, CT 06877

3" FORSTNER BIT 1/2" SHANK



ONLY \$34.99

Ship/Handl \$3.00

ITEM NO. #10-1322

**30-DAY
MONEY-BACK
GUARANTEE**

Call Toll Free (Canada included): 800-666-7227 • VISA/AMEX/MC
or write: Dollar Trading Corp. Dept. PW 80

PO Box 68666, Indianapolis, IN 46268

Indiana & Connecticut buyers please add sales tax.

Build a Shaker Table, with Kelly Mehler, ©1989 Taunton Press, Box 355, Newtown, CT 06470, 60 minutes, \$29.95 or \$14.95 to rent.

This qualifies as the project tape that I have been hoping someone would make. Many columns ago I bemoaned the lack of videos which could adequately guide a viewer through an entire project, from beginning to completion. Here we have one that does this not only adequately, but with flair.

Mehler escorts us through the entire process of making a piece of furniture, starting with the design stage and ending with

Alan Marks designs and makes furniture and cabinets in Carmel Valley, California, and is a contributing editor to PW.

an oil finish. Most impressive to me was the emphasis he places on the choice of material (the table is made from solid cherry) and the order in which pieces are chosen from available planks.

A woodworker who has worked for any length of time using solid wood construction develops a set method for determining the best use for the planks he has on hand. Standard procedure is to first select what will be used for the largest pieces on the cutting list and work one's way down to the smallest. Most of this is usually done in one's head. Kelly Mehler verbalizes these thought processes for the purposes of this tape, and anyone dealing with solid wood construction for the first time will benefit enormously from his monolog.

Mehler is extremely conscious of the esthetic importance of grain. Here, for the first time in woodworking video history, grain gets its proper consideration. Not only does it receive emphasis during the initial choice of material, but at every step of assembly. A viewer also learns how to deal with and circumvent defects in the material.

Anyone who buys this tape will more than appreciate the booklet which accompanies the tape. Besides providing some interesting autobiographical information plus a review of the project steps, the booklet also includes a plan of Mehler's unique workshop/showroom—a former auto showroom. It was interest-

Popular, Pocket-size
MINI-LIGNO
\$110
Only

Incl. Case, Batteries and Pins for 3/16" and 7/16" Measuring Depth.

Also available as:
Mini-E: Range 6-36%
Mini-C with external probe.

Everybody Knows

that the moisture content of wood is crucial. Moisture related defects such as surface checks, warpage, cracks, loose joints, foggy finishes, etc., can ruin the best piece ever built.

Everybody Knows

moisture defects are irreversible. Therefore don't waste money and time on wet wood. Use a moisture meter to be sure you work only with dry wood.

Ask for free brochure on moisture meters (range 4-30%, 4-60%) and accessories to monitor air or kiln drying.



Wood Moisture Meter P.O. Box 30145
from Lignomat USA Portland, OR 97230
Tel: 800-227-2105 503-257-8957



WOODCRAFT®

**The Leading Edge
In Woodworking Tools**

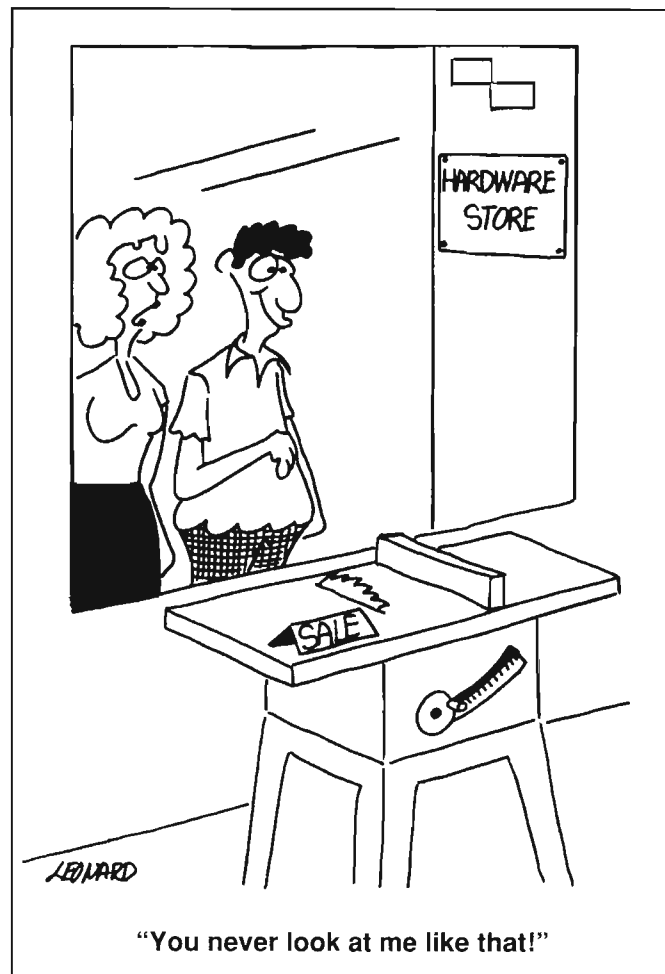
FREE Catalog Subscription

Our complete woodworking tool catalog features over 4,000 of the finest quality woodworking tools, books, and supplies available today. See the difference yourself FREE!



**Order yours today!
Call 1-800-225-1153**

Or write: Woodcraft Supply, Dept. 91PW09
210 Wood County Park, P.O. Box 1686
Parkersburg, WV 26101



ing to see Mehler's collection of antique machinery, some of which enjoys octogenarian status. Because his shop floor was designed to support motor vehicles, it has no trouble dealing with the crushing weight of his behemoth band saw or any of his other monster machines.

By watching this tape, you will learn how to convert rough planks into finished pieces for assembly. For the first time on video, the proper method for edge-jointing stock for a tabletop is shown. However, when he glued these pieces up, Mehler tapped them with a mallet. If you want to bang on a workpiece with a typical mallet, make sure you use a block of wood to absorb the blow. Though he didn't say so during this part of the assembly, he wasn't banging with a typical mallet. He used a **deadblow hammer**, which is usually made of plastic, is hollow, and contains a quantity of lead shot which is packed loosely inside. This type of hammer will not dent your workpiece. The deadblow was used later on and mentioned by name, but in my opinion this should have been done when it first appeared in the video, together with an explanation.

This tape also covers such things as tapering legs with the jointer, mortising with a plunge router, cutting tenons on a table-mounted router, using an overhead pin router, using a cabinet scraper plane and sharpening the iron for it, and glue-up

tips and procedures. It's an enjoyable, informative, and engaging tape from start to finish.

Introduction to Japanese Woodworking, with Jay Van Arsdale, ©1989 by A/Zo Productions, Box 7997, Berkeley, CA 94707, 70 minutes, \$29.95, shipping and tax extra.

The first question in my mind before I even looked at this video was "Who is Jay Van Arsdale?" When one considers how exotic the subject is and how many Japanese carpenters must be on the loose—even in this country—it seems a bit incongruous that an American should give such instruction.

Though he may not be Japanese, Van Arsdale knows his subject; however, he is by no means as impressive in his technique as some Japanese carpenters I have known. Their motions were a miracle of tight control and efficiency.

The opening of the tape consisted of some clips of toolmakers in Japan making woodworking tools with an overdubbed, monotonous voice explaining their activity. I asked myself, "What does this have to do with Japanese woodworking?" After about five minutes, the viewer is told that the accumulated knowledge and skill it took to create these fine instruments ought to inspire the woodworker to care for and respect them accordingly. It seems to me that this point was somewhat belabored, even though the emphasis on respect underlies all Japanese craft.

* SANDPAPER *

NO GIMMICKS — GREAT PRICES

BELTS: GRITS ASSORTED

SHEETS: (9 x 11) PRICE

UNLESS OTHERWISE SPECIFIED

CABINET PAPER

1 x 30	\$.69 ea	3 x 24	\$.80 ea	50 / pk	100 / pk
1 x 42	.69 ea	3 x 27	.83 ea	40-D	\$16 / pk \$30 / pk
1 x 44	.69 ea	4 x 21 1/4	.91 ea	50-D	15 / pk 27 / pk
2 1/2 x 16	.73 ea	4 x 24	.94 ea	60-D	14 / pk 25 / pk
3 x 18	.74 ea	4 x 36	1.14 ea	80-D	13 / pk 23 / pk
3 x 21	.77 ea	6 x 48	2.98 ea	100 thru 150C	12 / pk 21 / pk
3 x 23 1/4	.80 ea	2 1/4 x 80	2.47 ea		

OTHER SIZES ON REQUEST

FINISHING PAPER

NO LOAD PAPER				50 / pk	100 / pk
				80-A	\$ 9 / pk \$16 / pk
				100 thru 280A	8 / pk 14 / pk
				50 / pk	100 / pk
180-A thru 400-A	\$10 / pk	\$18 / pk			

WET / DRY PAPER

PRESSURE SENSITIVE				50 / pk	100 / pk
ADHESIVE DISCS!				220 thru 600A	\$13 / pk \$23 / pk

6"	\$1.06 ea	* OTHER ITEMS *	* JUMBO CLEANING STICK *
8"	1.99 ea	* WIDE BELTS	\$8.80
9"	2.46 ea	* ROLLS	
10"	3.05 ea	* FLAP WHEELS	
12"	4.45 ea	* PUMP SLEEVES	
15"	6.95 ea		

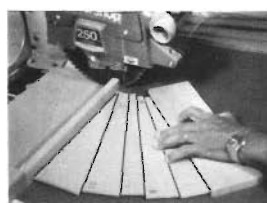
* MINIMUM ORDER \$25.00
* MASTERCARD, VISA OR CHECK
* SATISFACTION GUARANTEED!!

SEND MAIL ORDERS TO:
ECON-ABRASIVES
P.O. BOX P865021
PLANO, TX 75086

NATIONAL 1-800-367-4101

IN TEXAS (214) 377-9779

*TEXAS RES. ADD 7% SALES TAX
*SHIPPING CHARGES ADD \$4.75



FAST-No need to raise or lower saw or swing arm.
SIMPLE-Templates set the angle for you.
ACCURATE-Make exact angle cuts previously impossible with conventional dial setting.

EZE-ANGLEGUIDE SAWS 160 ANGLES with no saw adjustment!

8 templates, 160 angles from 1/2° to 80° \$24.95
Please add \$2.40 for postage.

SteussyCreations

334 ATHERTON AVE. NOVATO, CA 94945 415/897-1457

INVERTED PIN ROUTER



Duplicate intricate parts precisely with router speed
• plans
• kits
• finished tool brochure \$1.00

WOODKRAFT MFG.

Box 399, Ephrata, WA 98823

FREE CLOCKMAKING CATALOG

LOWEST PRICES!



• Quartz & Mechanical Clock Movements

• Dials • Hardware • Kits • Woodworking Tools • Music Movements and Boxes • and loads of other clockmaking and craft supplies!

Fill in and mail the coupon below for your FREE KLOCKIT Catalog:

Name _____

Address _____

City _____ State _____ Zip _____

KLOCKIT

Dept. PW290

P.O. Box 542, Lake Geneva, WI 53147

When the instructor finally appears on screen, he shows different types of Japanese chisels, their construction, and their uses. Then he switches to a discussion of water stones, followed by a demonstration of sharpening. Van Arsdale says that in polishing a blade with a man-made stone you get a bright chrome finish, but when a natural stone is used, a more desirable satin finish results. I have always been of the opinion that the brighter the chrome, so to speak, the better the edge because all scratches have been eliminated. Furthermore, I have gotten a chrome finish from my hard Arkansas stone, which, as far as I know, is a natural stone. So I don't know what to conclude; I would like to know the rationale behind the satin finish apparently preferred by the Japanese.

Next came a discussion of layout tools, and Van Arsdale laid out a mortise and tenon joint. He then demonstrated how to chisel out a through-mortise. After this, he introduced and discussed Japanese saws and used them to cut the tenon for this mortise.

For my part, I was intrigued by the way in which the through-mortise was cut. Among my collection of resounding failures can be found a less-than-successful hand-cut through-mortise. The instruction in the tape zeros in on the very problem I encountered, namely that I chiseled at an angle greater than 90°, and undercut the surface. The Japanese deal with this by chiseling halfway from each side in a progressively larger

series of V-cuts. When the cuts from the second side meet those of the first, you see daylight through the hole. Then it is a simple matter of removing the remaining waste and connecting the entry points. It really must be seen to be understood.

The Japanese joiner aims for a tight fit from end to end when the tenon fits into the mortise, whereas the cheeks of the tenon need not be so snug. I believe this is because the compression of the Japanese joint is what holds it in place. When you use glue, as we Westerners do, the fit of the cheeks is more important. Flat grain against flat grain gives a glued joint its holding strength.

Next came a discussion of planes and a demonstration of how to use the two types: the smoothing plane and the burnishing plane.

The tape concludes with some already-constructed samples of more complicated joints and a short discussion of the joinery in the Japanese sawhorses used in the tape. A leaflet which accompanies the tape gives detailed dimensions, instructions, and a cutting list for the sawhorses. Unfortunately, there is no index to this tape and no way of knowing in advance what topics will be covered except by watching it.

Despite a few shortcomings mentioned above, and in spite of poor close-up camera work, this tape is a good introduction to the subject and, to my knowledge, the only one available on the use of Japanese tools. **PW**

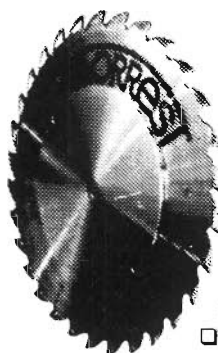
SAVE \$62

STOP "SCRATCHY" SAW CUTS and eliminate jointing and sanding.

Our Best Seller the 10" x 40T

Only \$94 (List Price \$156)

(other sizes available - see chart)



The One Blade That Leaves A Smooth-As-Sanded Surface!!!
(and lasts 10 to 20 sharpenings)

CALL 1 (800) 733-7111

IN NEW JERSEY (201) 473-5236. BUS. OPEN ACCT. CHECKS OR CREDIT CARD

- ☐ All purpose blade with 40 teeth and 1/8" or 3/32" kerf.
- ☐ Rips and Crosscuts 1" - 2" hard and soft woods.
- ☐ Cuts ply-veneers oak/birch with NO BOTTOM SPLINTER, (with blade set low and moderate feed rates).
- ☐ NO NEED TO CUT 1/16" OVERSIZE as JOINTING AND SANDING are USUALLY ELIMINATED (on a good machine).

SALE PRICES!!

NO-CHIP BLADES & DADO SETS for
MELAMINE & OAK/BIRCH VENEER
VERT. & HORIZ. PANL. SCOR. SETS
RADIAL & CHOP SAW
INQUIRE!!

WOODWORKER II (for table saws)

	List	SALE
14" x 40T x 1"	\$215	\$129
14" x 30T x 1"	195	117
12" x 40T x 1" 5/8" Bushing	183	109
12" x 30T x 1" add \$3.25	162	97
10" x 40T 1/8" or 3/32"	156	94
30T 1/8" or 3/32"	135	81
9" x 40T	146	88
30T	125	75
8" x 40T 3/32"	136	82
30T 3/32"	115	69
7-1/4" x 30T 3/32"	112	49
7" x 30T 3/32"	112	49
5/8" holes, boring thru 1-1/4" add \$7.50		
Larger at Time Basis	Shipping \$3.50	

FOR BETTER CUTS on all brands of blades, use our large 1/8" DAMPENERS-STIFFENERS against one side.

- Parallel and flat to .001 6"\$25
- Stop vibration, flutter, cutting noise and blade ring 5"\$24
- Tryable and returnable for full cash refund 4"\$21

FREE dampener or \$10 off with any 2nd blade
FULL RANGE OF OTHER INDUSTRIAL SIZES

BUS. OPEN ACCOUNT



TO ORDER BY MAIL, clip ad, circle choices and enclose payment. Specify Dept. WS when ordering.

PHONE TOLL FREE! 1 (800) 733-7111

To Inquire Or Order In NJ: (201) 473-5236

SATISFACTION GUARANTEED OR FULL CASH REFUND.

40 years of fine American Saw making & sharpening.

Dealer Inquiries Welcome

FORREST

MANUFACTURING COMPANY, INC.

461 River Road Dept. PW

Clifton, NJ 07014 1 (800) 733-7111

WE RECOMMEND OUR FACTORY SHARPENING (all makes of blades)
(600 grit microscoped)
2-3 DAYS ON THESE AND ALL MAKES OF CARBIDE TIP SAWS.
SHIP UPS.
10 x 40T \$15.00, 60T \$17.75. Add return UPS \$3 or 2nd Day Air \$5.

FORREST

Bench Planes

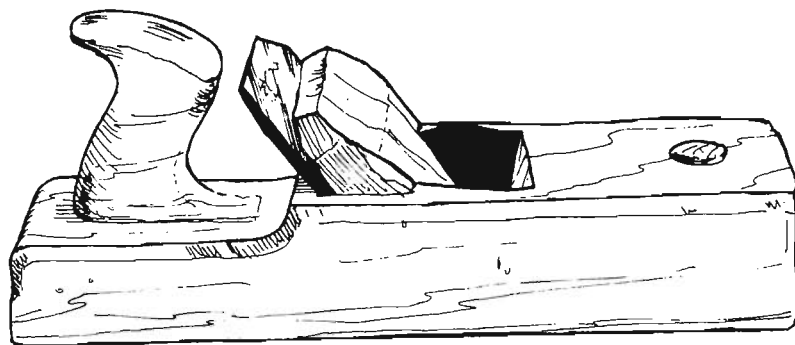


Figure 1. Jack Plane

Planes, especially the bench planes, are the tools that define fine woodworking. You can make a lot of things out of wood, and you can work with wood in many ways, but if what you do is related to furniture or joinery, chances are that planes are indispensable. That planes are now often powered does not alter the fact that planing is central to fine woodworking. Like many other aspects of life that have changed dramatically in this century after remaining constant for hundreds of years, planing appears to have altered radically. But in fact the operation is the same as ever, the object being to produce a flat and smooth surface from the rough and uneven material of raw wood.

Where speed, economy, and consistency are concerned, the machine is supreme. You'll find few hand planes in the great furniture factories today, and even many small shops have abandoned them in favor of planers and jointers that work fast and efficiently. But those at the top of the craft know that there's still no substitute for the quality of a surface produced by a properly tuned plane in the hands of a skilled user. If you want to reveal as much of the wood's inherent beauty as possible, then abrading and machining into technical flatness is no match for the

effects made possible by cutting fibers and cells so cleanly that you can literally see into the wood.

Furthermore, a well-tuned plane can often outperform the average jointer or planer when it comes to difficult grain or knots, features that machine-users call defects. Every machine operator fears tear-out, and spends inordinate amounts of time and energy adjusting knife depth, rotation speed, feed rate, and depth of cut.

Competent planing is no longer as common as it once was, and many woodworkers have never seen a properly tuned tool being used with skill. Disbelief in the superiority of the hand plane is common today, and even when all the great woodwork of the past is offered as evidence of what can be done by hand, the response is often, "Who has time for that?"

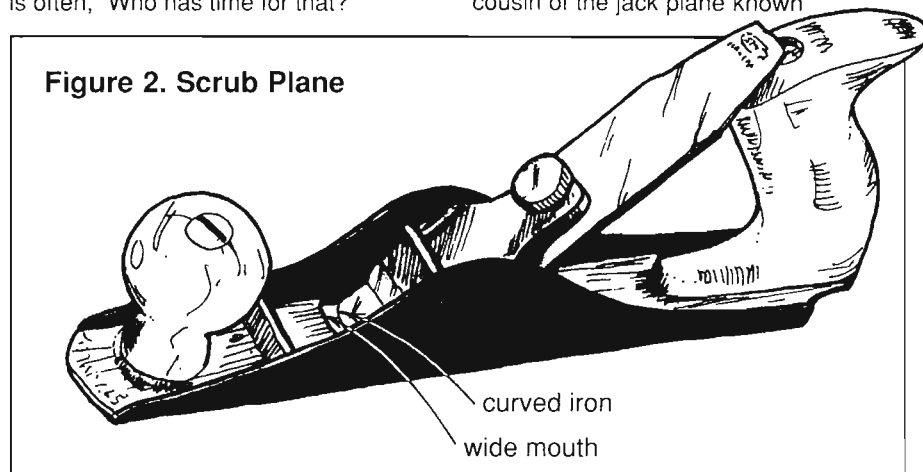
Not only does it *not* take as much time as you might think to acquire the skill and put it to use, but time is not necessarily most important in the pursuit of woodworking. Time counts if you must produce a given number of items in a given period of time in order to pay the rent and stay afloat. But if quality is important, and if you value your love of the material and enjoyment of the process, there are other ways to "skin the cat." The bench plane can be your secret weapon if you know how to use it. It's important to realize that what is commonly sold as a bench plane today is often only a poor relative of the bench plane as it once was. Nevertheless, adjustments are possible, and even a new tool can be made to perform well.

Defining the Bench Plane

Bench planes—jack, smooth and jointer planes—are used at the workbench to prepare and finish the surface of boards. Of course, every plane works the surface of a board, but bench planes don't cut grooves, make joints or form special shapes. Once a piece of wood has been sawn to workable size, it must receive at least one flat or true surface. Without this first step, all subsequent operations are difficult or impossible. Before there were jointers and planers, this was accomplished with the jack plane (Figure 1).

Nineteenth century ingenuity, which produced an amazing plethora of specialized planes, also came up with a close cousin of the jack plane known

Figure 2. Scrub Plane



Graham Blackburn is a furniture designer and maker in Rio del Mar, California and author of many books on woodworking and home maintenance including *A Home for All Seasons*.

Tried and True

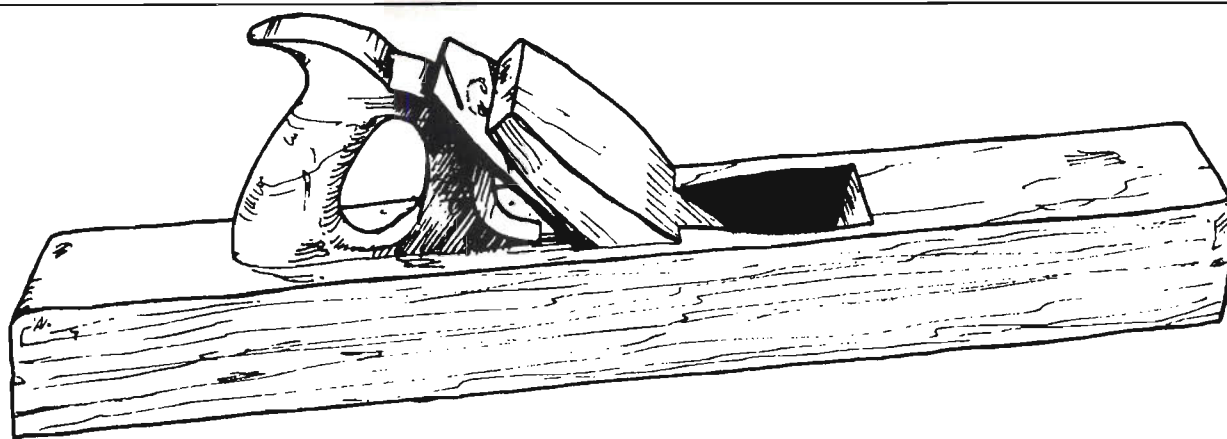


Figure 3. Jointer or Trying Plane

as the scrub plane (Figure 2). Made of metal with a narrow blade set in a wide mouth, it was designed for use as a kind of preliminary jack plane to remove gross unevenness before getting to work with the jack plane. It works well, but unless you're smoothing logs or extremely roughsawn material, it's usually unnecessary since the curved profile of its hungry blade removes very large quantities with each pass.

When a board has been cleaned up and made flat, it is then possible to pay attention to such considerations as width, thickness and relative parallelism. If the required thickness is less than can be achieved conveniently by sawing, then the jack plane is used again, but when it's time for further planing to achieve edge or surface trueness over length, and a greater degree of flatness and smoothness, then it's time for the mid-range of bench planes.

These include jointers, foreplanes, try-planes (or trying planes—see Figure 3), and panel planes. There's some confusion concerning these names, and usage has varied over the years, but for now they can all be lumped together as the second major group of bench planes. Finally, there are smooth or smoothing planes (Figure 4) whose purpose is simply to finish an already flat surface to the utmost level of smoothness and perfection.

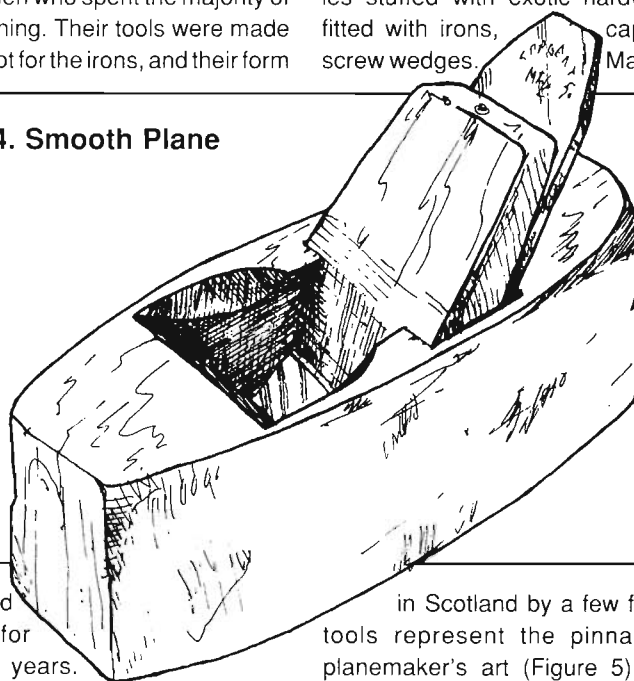
Planing in the Past

When Chippendale worked in St. Martin's Lane and produced masterpieces that are standards of excellence in our craft, planing was not one of his daily

tasks. If he'd had machines, undoubtedly he'd have used them—up to a point. He was a designer and businessman, and as soon as he was able he hired apprentices and journeymen who spent the majority of their time planing. Their tools were made of wood except for the irons, and their form

making was approaching an all-time high. Bench planes, which had remained the same for hundreds of years, were being reinterpreted using dovetailed metal bodies stuffed with exotic hardwoods and fitted with irons, capirons and screw wedges. Made largely

Figure 4. Smooth Plane



had remained unchanged for hundreds of years.

The angle of the iron, the shape of the stock, and the design of the throat and wedge, though apparently straightforward, are in fact masterpieces of sophisticated tool design honed to perfection by centuries of practical experience. To use one of these tools properly adjusted and sharpened is to understand that the production of an eighteenth century masterpiece was not totally the miracle that most consider it to have been when they regard the "primitive" tools of the time.

In the mid-nineteenth century, tool-

in Scotland by a few firms, these tools represent the pinnacle of the planemaker's art (Figure 5). Designed originally for the most demanding craftsmen, they were never copied in America, where firms were more concerned with mass production. Technology was sowing seeds which would render obsolete these examples of the best tools ever made; right when they were being made to standards never before attained, the introduction of power was ousting these tools from the workplace. Regular commercial production of the dovetailed and stuffed body plane ceased shortly after World War Two, but the demand from collectors and

illustrations by the author

discriminating users has prompted several specialty firms to make copies and new designs embodying the best features of the archaic types.

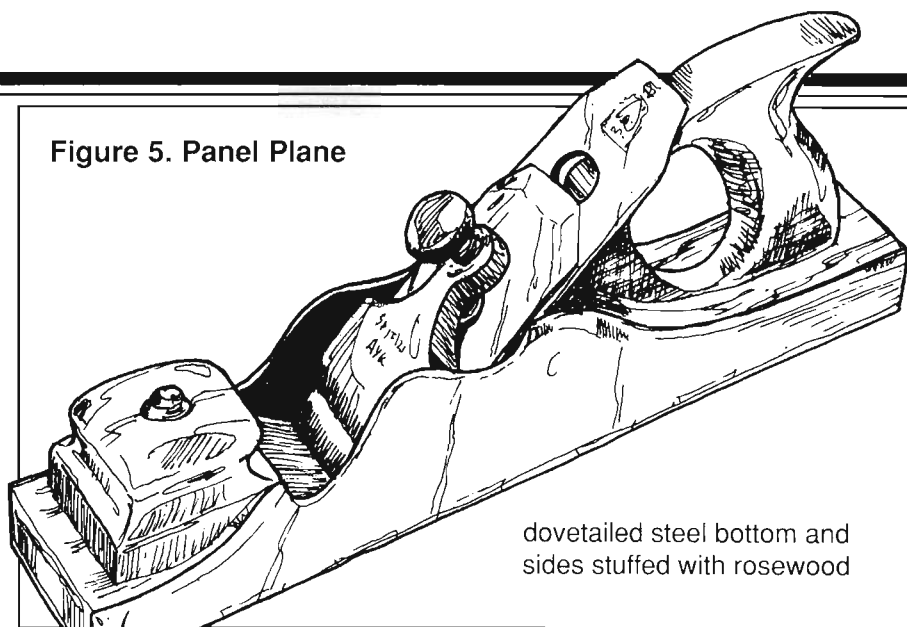
Although hunting for such a plane is well worthwhile, just finding one of these tools, old or new, will not guarantee you a new world of planing pleasure. What follows will be concerned with how to appraise and improve a tool's condition, and should help put you on the right path.

The Importance of Flatness

One necessity common to all types of planes is flatness of the stock's sole. But judging flatness is almost as hard as achieving it. You need a reliable reference. For practical purposes, acquiring a three or four foot long machinist's straightedge is the best that can be done. These are precision tools, and can cost as much or more than a good quality plane. You don't need a graduated one—a tape is good enough for shop measurements—

but to do accurate work with ease, the degree of flatness measurable by a machinist's straightedge is indispensable. Though they look like nothing more than a simple length of steel, as precision instruments they must be treated with care.

Figure 5. Panel Plane



dovetailed steel bottom and sides stuffed with rosewood

look for light here

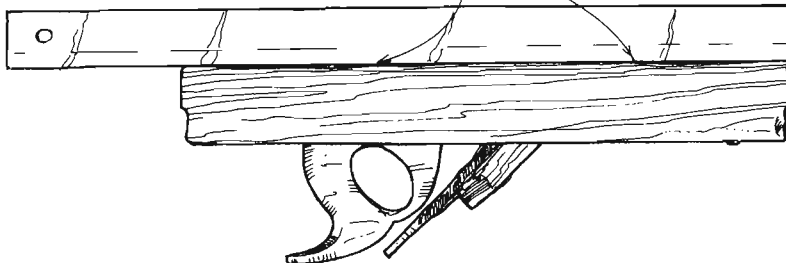


Figure 6.
Testing a Plane's Sole for Flatness with a Straightedge

When you lay one down, make sure it rests flat over its entire length and isn't pivoted on some other object. Protect the beveled edge, realize it is sensitive to extreme heat, and never pick it up by one end.

Hold the straightedge against the sole of your plane to see whether any light is visible between them (see Figure 6). Retract the iron into the mouth, but keep it wedged in place so that any stressing of the body that is caused by wedging is taken into account.

If your plane doesn't measure up, and they usually don't, there are various remedies. With a certain amount of patience, you can flatten the sole yourself in your own shop. What you'll need is a piece of plate glass that is 18" to 24" square and some silicone carbide powder (available from Garrett Wade, 161 Avenue of the Americas, New York, NY 10013, or Lee Valley Tools, 1080 Morrison Drive, Ottawa, Ontario, K2H8K7 Canada). Pour a small amount of water on the glass and add some of the abrasive powder. Lap the sole of your plane in this slurry using "figure 8" strokes. You will quickly see shiny areas as the high spots are polished; keep lapping until the low spots disappear.

Machine shops can precision surface-grind metal-bodied planes. A machine shop, however, will charge upwards of forty dollars and needs to know that the plane must be ground with iron and wedge (or capiron) retracted in place, and that the sides must be held carefully and protected

uneven mouth opening

impossible to shoot at right angles

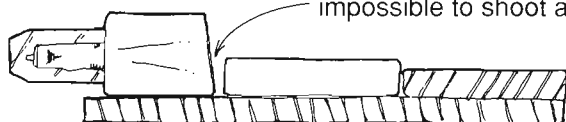


Figure 7.
What Happens When Sole is not Perpendicular to Sides

Tried and True

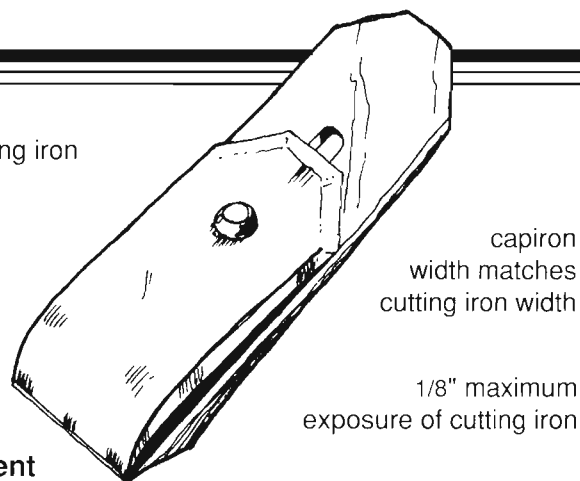
from scratching. Flattening the sole is not the only consideration: it must be done while maintaining perpendicularity with the body sides, and with the awareness that grinding the sole necessarily enlarges the mouth. Wooden-bodied planes can be remouthed, but an overly enlarged mouth on a metal-bodied plane spells the end of its usefulness for fine work, no matter how flat the sole. Submit only a quality plane to such a process, and make sure the machinist is skilled and sensitive to the need of the job.

The same requirements hold true for wood as for metal. Wooden-bodied planes can be hand-dressed and planed flat using other planes, or by taking very light passes (1/32") on a jointer. The sole must be kept perpendicular to the sides. With many wooden planes, especially the larger sizes, this is made difficult by the fact that shrinkage may have caused a slight bulging around the throat area where the iron has prevented the stock from becoming as narrow as it has at its ends. Perpendicularity is necessary (see Figure 7) because anything less will produce a mouth wider at one side than the other, with the result that the iron will have to be wedged in place somewhat askew if it is to project equally across its width, or else be reground out of square. These solutions are undesirable because the work needed defeats the purpose of having an easily adjustable tool. Furthermore, lack of perpendicularity makes using the plane on a shooting board impossible

capiron fixed to cutting iron with no wobbling

(for smooth planes corners flush with capiron)

Figure 8.
Capiron Adjustment



without compensating wedges.

Understanding the Mouth

No matter how well-sharpened the iron, unless its capiron is properly fitted and together the two bear the correct relationship to the plane's mouth, good results will be hard to come by. The capiron must fit perfectly against the back of the cutting iron and extremely close to the edge. Even for a plane designed to take coarse shavings, such as the jack plane, this distance should not be more than 1/8". For finish work, where the finest shavings are taken, less than 1/32" is not too small (see Figure 8).

A properly sharpened and fitted iron and capiron is not enough, however. The size of the mouth is all important. Certainly it must be large enough for the jack plane's substantial shavings, but what is less obvious is that for the finest possible shavings the mouth must be so small as to seem closed up. Close examination of a

stuffed type plane's mouth, when fitted with a properly sharpened iron, will prove the best indication of how small mouths should be. The range of frog adjustment (the frog is the assembly to which the irons are affixed) possible in Stanley type planes also demonstrates how small a mouth can be made for the finest work.

The procedure for achieving a small mouth with a wooden plane is shown in Figure 9. Since wooden planes wear down with use and should be rejoined (have their soles planed flat) from time to time, remouthing is normal maintenance. If a metal plane has too large a mouth, it may be possible to build up the part against which the iron rests (the bed) so that the iron is positioned further forward, but this can be difficult with metal planes of the Stanley type where the bed is the frog to which the capiron is screwed. Stuffed plane's beds are, of course, made of wood and present no difficulty to this operation. A small mouth is an absolute necessity since this narrowness is what controls the plane's ability to take a very thin shaving without having the cut run back into the wood. Because of this ability to eliminate tear-out, knots and difficult grain present no difficulties.

A final consideration is the condition of the cheeks and the consequent wedge-holding ability of the plane. No matter what its type, the plane's body must be able to hold the wedge securely—broken abutments or cracked cheeks make this impossible, as do faulty capscrews and wobbly irons. The iron may wobble not only because it is held insecurely but because the bed may need adjustment—re flattening or perhaps just cleaning. **PW**

illustrations by the author

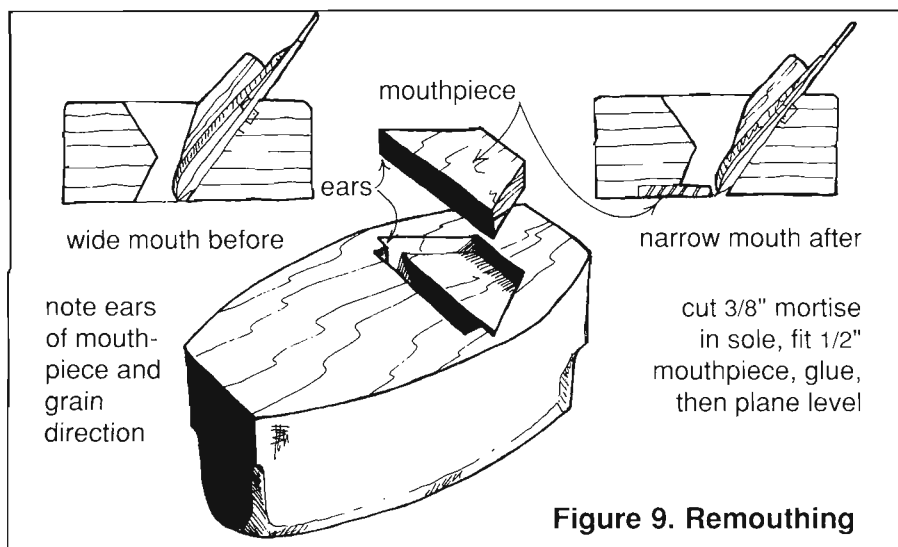


Figure 9. Remouthing

ORDER YOUR BACK ISSUES OF *POPULAR WOODWORKING* TODAY!

Check out our exciting woodshop plans and techniques.
You're not just ordering a magazine,
you're ordering 4-6 sets of plans you can use!

- | | | |
|---|---|---|
| #1 ☐ May 1981 \$1.00
<i>Sound and Its Effects</i>
<i>Goodwill's Contract Shop</i> | #31 ☐ June/July 1986 \$2.95
<i>Make Your Own Solar Kiln</i>
<i>Making a Watch Clock</i>
<i>Penultimate Patio Chair</i> | #42 ☐ April/May 1988 \$2.95
<i>Designing for</i>
<i>Dimensional Change</i>
<i>Garden Cart</i>
<i>Diamond Hones Review</i> |
| #2 ☐ July 1981 \$1.50
<i>Assembly Furniture</i>
<i>Solar-Heated Wood Dryer</i> | #32 ☐ Aug/Sep 1986 \$2.95
<i>Martha Thompson's</i>
<i>Magical Mirrors</i> | #44 ☐ Aug/Sep 1988 \$2.95
<i>Baby Dresser</i>
<i>Peeled Branch Settee</i>
<i>Marionette</i> |
| #6 ☐ April/May 1982 \$1.50
<i>Making Wooden Boxes</i>
<i>Abrasive Belt Cleaner Test Report</i>
<i>Table Saw Hints</i> | #33 ☐ Oct/Nov 1986 \$2.95
<i>Power Carver's Tool Cabinet</i>
<i>Building a Wine Rack</i> | #45 ☐ Oct/Nov 1988 \$2.95
<i>Corner Pewter Hutch</i>
<i>Country Sconce</i>
<i>Massachusetts Lowboy</i> |
| #7 ☐ June/July 1982 \$1.50
<i>Interview with Sam Maloof</i>
<i>Make a Maloof Table Pedestal</i>
<i>Create a Maloof Finish</i> | #34 ☐ Dec/Jan 1987 \$2.95
<i>Universal Table Saw</i>
<i>Veneered Vertical Tambours</i>
<i>Build-It-Yourself</i>
<i>Backgammon Board</i> | #46 ☐ Dec/Jan 1989 \$3.75
<i>Walnut Dining Table</i>
<i>Child's Cupboard</i>
<i>Japanese Handsaws</i> |
| #8 ☐ Aug/Sept 1982 \$1.50
<i>Starting a Woodworking Business</i>
<i>Table Saw Maintenance</i>
<i>Rockwell Speed Block Sander</i> | #35 ☐ Feb/March 1987 \$2.95
<i>Building a Butcher Block</i>
<i>Work Center</i>
<i>Ladder-Back Rocker</i> | #47 ☐ Feb/March 1989 \$3.75
<i>Bending Wood</i>
<i>Duck Basket</i>
<i>A Tilting Mirror</i> |
| #9 ☐ Oct/Nov 1982 \$1.50
<i>Staining Wood</i>
<i>Quest for the Thinnest Blade</i>
<i>Marketing</i> | #36 ☐ April/May 1987 \$2.95
<i>Folding Picnic Table</i>
<i>Carving an Arabian</i>
<i>Stallion-Part I</i> | #48 ☐ April/May 1989 \$3.75
<i>Victorian Table</i>
<i>Decorative File Cabinet</i>
<i>Carving Carousel Animals</i> |
| #10 ☐ Dec/Jan 1983 \$1.50
<i>Selecting a Portable Sander</i>
<i>Sealacell Wood Finish</i>
<i>Test Report</i>
<i>Evolution of an All-Wood</i>
<i>Box Design</i> | #37 ☐ June/July 1987 \$2.95
<i>Interview with James Krenov</i>
<i>Plate Joiner Test Report</i>
<i>Koa Dinner Table</i> | #49 ☐ June/July 1989 \$3.75
<i>Colonial Footstool</i>
<i>Coloring Wood</i>
<i>Wall Cabinet</i> |
| #25 ☐ June/July 1985 \$2.25
<i>Octagonal Pedestal Table</i>
<i>In-The-Round Carving</i>
<i>Building the Strip Canoe</i> | #38 ☐ Aug/Sep 1987 \$2.95
<i>Dovetail Joinery</i>
<i>Connecticut River Valley</i>
<i>Desk on Frame</i> | #50 ☐ Aug/Sept 1989 \$3.75
<i>Make a Pirate Chest</i>
<i>Laminated Bracelets</i>
<i>Mahogany Table Set</i> |
| #27 ☐ Oct/Nov 1985 \$2.95
<i>The Computer Desk</i>
<i>Alternate Bowl-Turning Techniques</i>
<i>Cradle Table with Magazine Bin</i> | #39 ☐ Oct/Nov 1987 \$2.95
<i>Relief Carving</i>
<i>Make Handscrew Clamps</i>
<i>Tall Chest of Drawers</i> | #52 ☐ January 1990 \$3.95
<i>Sculptural Coffee Table</i>
<i>Folding Candelabra</i>
<i>Firewood box</i> |
| #28 ☐ Dec/Jan 1986 \$2.95
<i>Cedar Hope Chest</i>
<i>The Shamisen Process</i>
<i>Blind-Wedged Peg Joint</i> | #40 ☐ Dec/Jan 1988 \$2.95
<i>Making Box Joints on the</i>
<i>Table Saw</i>
<i>Biplane Walker</i> | #54 ☐ May 1990 \$3.95
<i>Windsor Stools</i>
<i>Cutlery Box</i>
<i>Handy Step Ladder</i> |
| #29 ☐ Feb/March 1986 \$2.95
<i>Making a Piano Bench</i>
<i>Signaling Sailor Whirligig</i>
<i>Carving the Human Head</i> | #41 ☐ Feb/March 1988 \$2.95
<i>Making a Jewelry Chest</i>
<i>Wooden Buckets</i>
<i>Dry Sink TV Cabinet</i> | #55 ☐ July 1990 \$3.95
<i>Plate Shelf</i>
<i>Bee Hive Jewelry Box</i>
<i>Sliding Miter Table</i> |
| #30 ☐ April/May 1986 \$2.95
<i>Mortise and Tenon Joinery</i>
<i>Teak Serving Cart</i>
<i>Trestle Table and Stool</i> | | |

All available back issues for only \$80.00.

This price includes postage and handling.
(Add \$8.00 postage for foreign countries.)

Add \$2.00 postage and handling for up to ten copies.
If ordering more than ten copies, add \$2.00 per lot of ten.

Please send my back issues to:

Name _____

Address _____

City _____ State _____ Zip _____

If you are a subscriber, you can help us to expedite your order by copying the info from the top line of your mailing label here:

☐ Personal Check

☐ Visa/Mastercard

Card# _____ Exp. Date _____

Send your order and payment to:

Popular Woodworking Back Issues, 1320 Galaxy Way, Concord, CA 94520.

WORKING WOOD in

By Dennis Michael Morrison

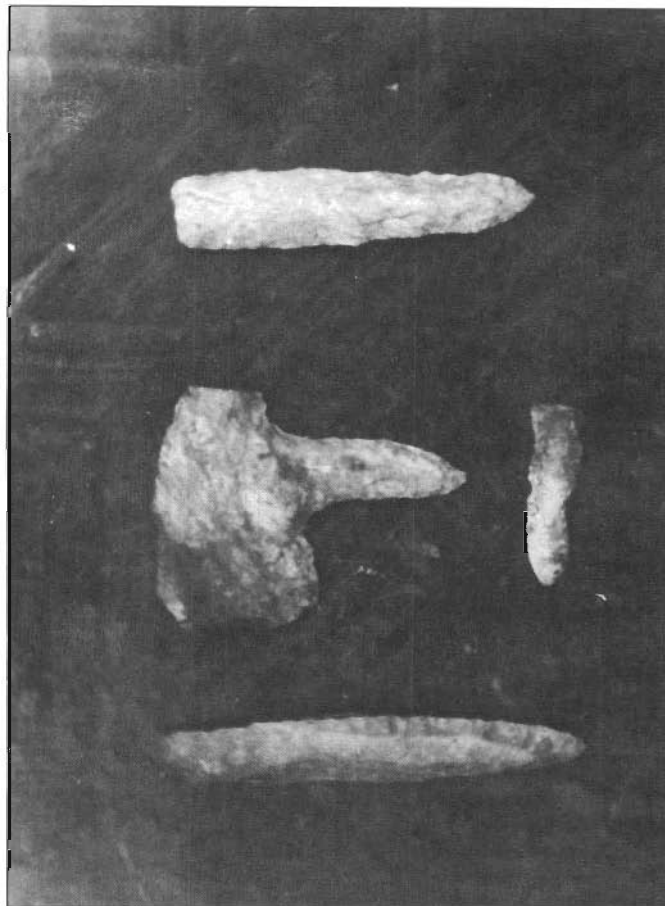
When we consider the prehistoric peoples of the Americas, we naturally tend to think of the beautiful stone artifacts on display in museums and private collections. And why not? After all, this period before writing is generally known as the "stone age." Nonetheless, when the Europeans first made contact with the Indians, they found that wood implements were as abundant as stone ones. We have few prehistoric wood relics today, of course, because untreated wood does not stand up well to the ravages of time. A few examples of Native American woodworking have survived, one not far from where I live. From out of the muck along the AuSable River near Oscoda, Michigan, was pulled a dug-out canoe; but such relics are few and far between.

Many of the stone tools recovered by archeologists are directly related to woodworking. Let's take a look at these stone "woodworking" tools, and some of the woodworking duties that occupied the American Indians.

The basic tool was the ax or celt, the difference being that the ax is grooved in order to attach the handle, while the celt is not. Axes are grooved in several ways—in some the groove runs all the way around the stone, while others show a three-quarter or half groove. Celts are easier to make and more abundant than grooved axes, but the manufacture of any stone tool is a complicated and difficult endeavor, requiring skill developed through considerable practice. Most axes are single bitted, although double bitted ones have been found, and some are fluted and barbed. Prehistoric peoples also made ceremonial axes which were often quite elaborate and intended for burial inclusion.

Felling a tree with a stone ax or celt was a laborious undertaking. The most common method was to build a fire around the base of the tree and burn into it as far as possible. Then an ax was used to chop away the carbonized wood. The process was repeated over and over until the tree was downed. When planks were required, stone or wood wedges were used to split what was needed off the trunk. Another important tool in Indian woodworking was the stone drill. Generally made of chert and either straight or T-shaped, they were set in wooden shafts and spun by hand or by the use of a bow.

The adze, usually hefted in wood from the crotch of a tree, was essential in many native American tribes (to make your own steel



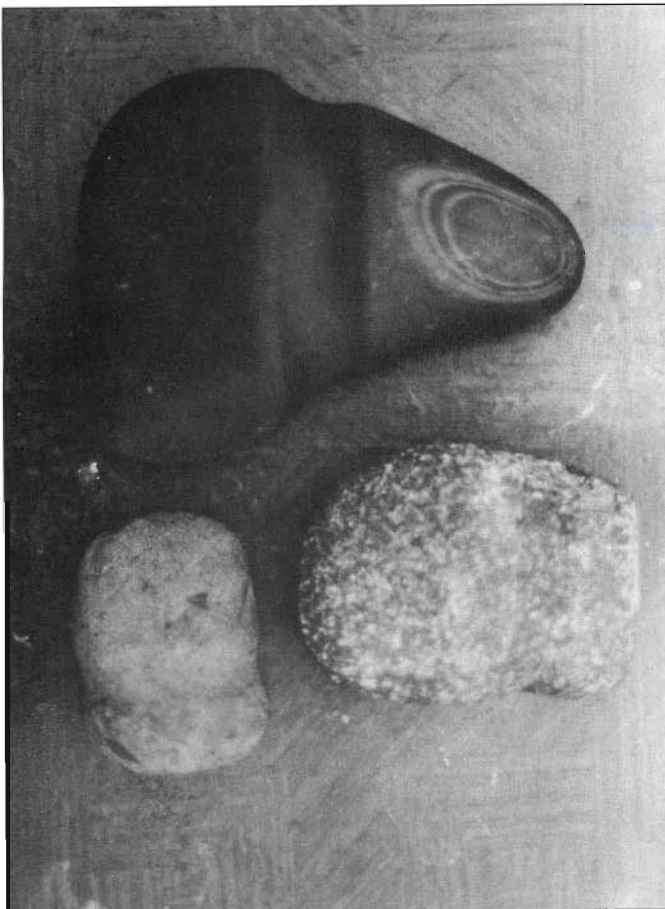
The four stone artifacts shown above are all drills, and were originally fitted into wooden shafts.

version, see "The Indian Adze" in *Popular Woodworking* #54, May 1990). It was especially useful in carving dug-out canoes. The method was similar to felling a tree: the maker burnt into the log and carved away the charred wood. A friend of mine tried his hand at the ancient method and carved his own dug-out in 46 hours—not a bad expenditure of time when you consider the vessel should last 15 years or more.

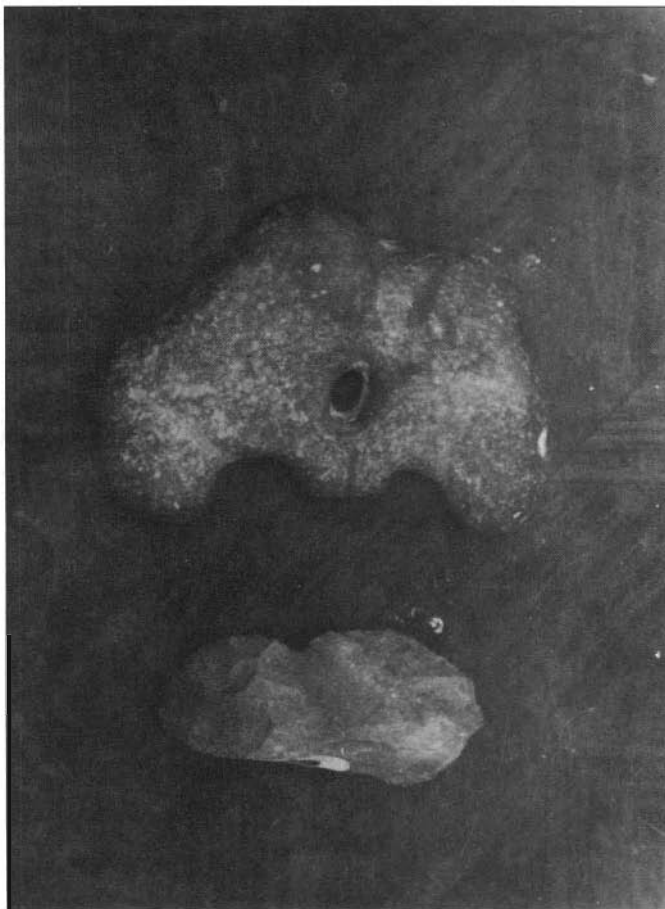
Native Americans made many fine small items of wood. Wooden spoons were common, as were bowls, face masks, and in some areas, totem poles. While the rough forms could be worked out with the ax and adz, something akin to a knife was needed to fine tune them. The waste slivers from the chipping and flaking of arrowheads provided a rich source of carving and

From Greenbush, Michigan, **Dennis Morrison** is a woodworker, antique restorer and free-lance writer specializing in Native American archeology and local history.

the AGE OF STONE



photos by the author



The fully grooved axe above left was ceremonial. The other two obviously saw a lot of use. The side notches in the tool above right were used to straighten arrow shafts. The center hole and notches show that it was also worn. The side notch in the other piece was used to cut and smooth shafts.

whittling blades. If you've ever excavated at an archeological site where chert had been worked, you probably sliced your hands more than once on the razor sharp debitage. The pieces flake off in all sizes, and all are ideal for wood carving.

An important use for wood was in the making of arrow shafts. The photo above right shows notched tools used to smooth shafts. The Indians also made and used stone "wrenches" for straightening shafts, and sometimes these tools were worn as personal ornamentation. Some tribes fashioned war clubs, fish hooks, bows, baby carrying boards, and even pipestems from wood. Another important use for wood in the "stone age" was structural—the small trees felled and employed as poles in the great variety of Native American homes.

Basketmaking was very much a woodworking art. John and Sue Nagogwon, Native Americans who make baskets "in the old way," begin by felling a black ash tree and cutting it into manageable lengths. The wood is beat with a hammer (stone in ancient times) until the annual growth rings can be separated and cut into strips. After they have dried, the strips are split into thinner strips which are then woven into sturdy baskets.

I've just scratched the surface of an immense subject. Next time you're wandering through a museum or find an arrowhead in your garden, remember that stone was just one part of the "stone age" and Native American culture. Woodworking is a tradition whose roots are perhaps more venerable than those of any other craft. **PW**

A Popular Woodworking Project

Creative Log Turning

In woodworking, so often we just follow someone's drawing or go along with what has been made before. There comes a time, however, when the artist in us just has to come out, when our imagination seeks expression. If you ever have those feelings, here's an answer. Out of your imagination you can create unique and exciting things on your lathe. Weed bottles, candle holders, small boxes or bowls all can be turned from pieces of tree branches, parts of small tree trunks, or chunks like burls cut from larger trees. Take a walk in the woods or visit your wood pile, and you'll find all kinds of interesting pieces to start with. Just put one in your lathe and go where your imagination takes you. You decide what each piece is going to be and how it's going to come out, and develop it according to what you uncover as you progress in your turning.

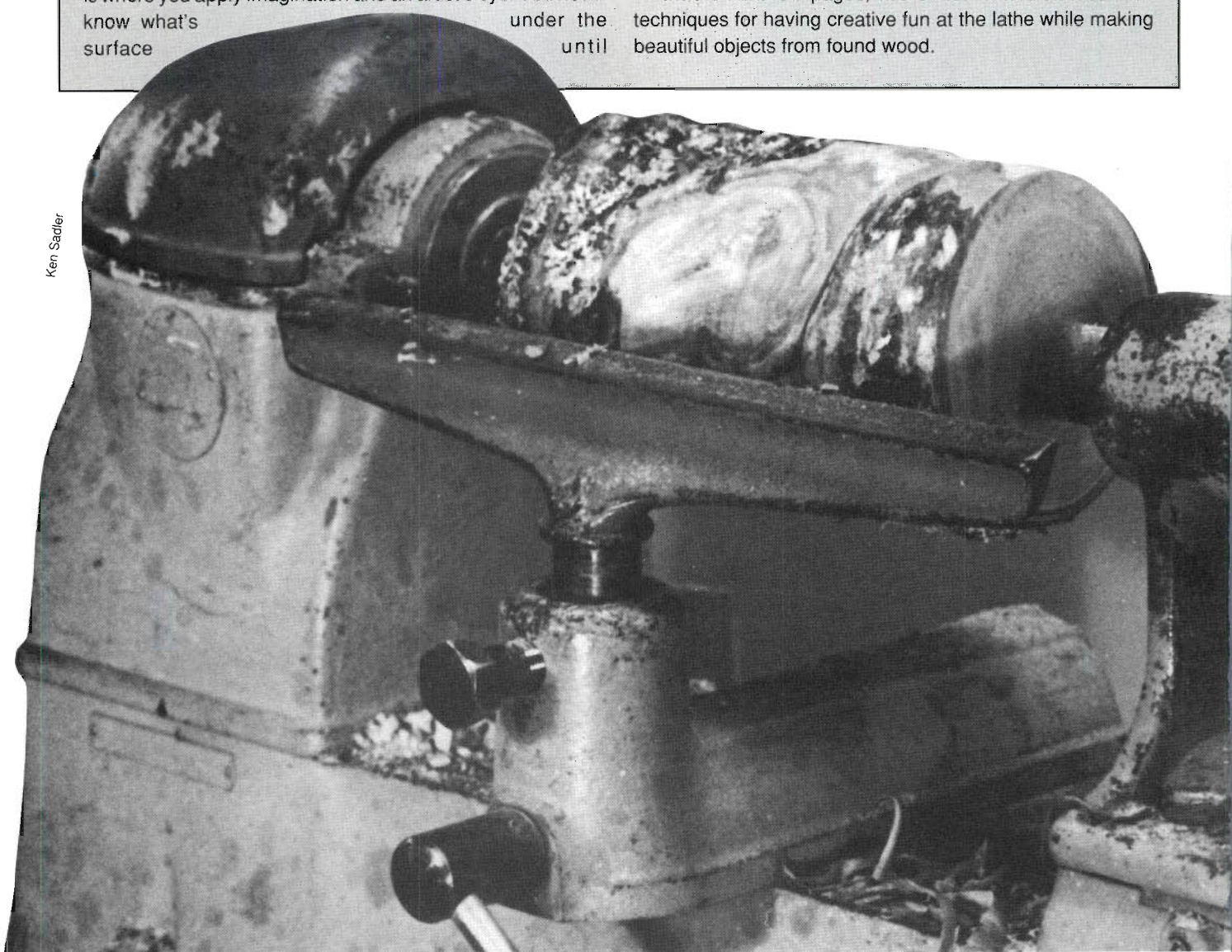
You can leave most of the bark on or cut it all off, mount the piece off-center and get strange patterns, or take advantage of contrasting colors between sapwood and heartwood. Here is where you apply imagination and an artist's eye. You never know what's under the surface until

you cut into it. A branch that has died and fallen off a small tree leaves a grain pattern inside the trunk. When you begin to cut into it, that pattern comes out in a variety of ways depending on how you cut it.

If you keep your eyes open, you will find that logs suitable for turning are available from many sources. Most of these are free, but if you must purchase them, you will probably pay the firewood price rather than the price a cabinetmaker would pay. If you have access to a privately owned forest or wood lot, you have a perfect source. If not, talk to your local park and road maintenance crews. They often cut down trees and are more than happy if someone saves them the work of carting the wood away. Also, trees are often cut to make room for new homes or commercial buildings. Talk to the contractor, donate a few bucks to his crew's refreshment fund, and you will probably have carte blanche to anything they cut. From time to time, you or your neighbors will remove or trim trees—yet another source.

On the next few pages, two of our writers discuss their techniques for having creative fun at the lathe while making beautiful objects from found wood.

Ken Sadler





Turning Dry Wood Between Centers

by Warren Asa

I prefer to turn dry logs so my finds usually require some seasoning. I live in a dry, warm climate, so I can depend on time and paint to do this for me. I saw the ends reasonably square and give them a coat of good quality left-over enamel. Paraffin melted in a double boiler works just as well. After painting I stack the logs in my shop so air can circulate around them. The weather in southern

Warren Asa has been whittling and woodcrafting since his scouting days. He specializes in native American folk craft.

California rewards me with nicely seasoned wood in about a year or so. If you live in a cooler or damper part of the world, you may have to place your logs in a heated building or even resort to a lumber kiln to reduce the moisture content. I normally save up logs until I have a few weeks of turning stock on hand. Then I sharpen up my tools and let the chips fly as I indulge my passion for woodturning.

The bottle-shaped turning in the photo below is often called a captain's flask or a ship's decanter. They apparently were used on all manner of vessels from canal barges to magnificent sailing ships. The low center of gravity kept them from tipping, and makes for a pleasing design. I make them from 6" to 10" high, with the widest diameter being roughly the same as the height. Drill a 3/4" to 1" hole about 1/2" deep into the top to create the rim of the flask. If you want the flask to hold water for a flower, drill a hole to accept a glass or plastic test tube.

To me, the first rule of log turning is safety. Inspect every piece for serious cracks and discard all offenders. The last thing you want is to have wood flying around your shop. Make sure that the lathe centers are set deep enough and are placed in solid wood—not in the pith. On small logs you can saw an "X" for the

live center, just as you would on square stock. On larger logs you may find it easier to incise an "X" with a sharp chisel.

A log that is badly out of balance can be really scary when you start your lathe. Because of this, I true up my logs as much as possible before mounting. Adjust your tool rest to clear the log, and tighten it well. Set your lathe at its slowest speed, and select your largest gouge. Start with very light cuts.

Some turners use a parting tool to establish the depth at key points along their project. I rarely do this when turning logs. After forming a perfect cylinder

Drill a hole to accept a test tube if you want to put flowers in your captain's flask.



photos by the author



der, I lay out the main linear features with pencil marks, and with a sharp gouge and a medium speed, I start cutting—always moving my tool from high to low. By moving from high to low, the tool cuts with the grain, which makes for smoother cuts and less tear-out.

There are just two main cuts for the captain's flask. Start with the cut from the widest part to the bottom, using a large or medium gouge. Make this a nice full curve. The next cut is the big one from the widest section to the neck.

As my captain's flasks are always one-of-a-kind pieces, I do no measuring after the initial layout. Whatever looks good on the lathe is what I end up with. My rule of thumb on these flasks is to locate the widest part 1/5 to 1/4 of the way up from the bottom.

To turn the candlestick set, I follow the dimensions given on the full-size pattern in the PullOut™ Plans. I use calipers to achieve accuracy. Start by shaping the top and then proceed with the major cut from the base to the narrowest part. A round-nosed tool is ideal for the top



Warren Asa

and a big gouge for the major cut. Because the thin portion is so weak, you may have to provide some support when turning these. I find a gloved hand works well. Don't attempt these candlesticks with soft, weak woods or logs with a large pith. **PW**

Green Wood and Faceplates

by Ken Sadler

I like to make platters and bowls, weed pots, bottles, and "candlestumps." The pieces make wonderful, unique gifts that will be highly appreciated. If you sell your output at craft shows and fairs, they are an unusual product that will attract considerable attention and bring a good price. Early on in my furniture business, when I didn't have enough furniture orders to keep me busy, I made many such pieces. They sold so well that I couldn't keep up with the demand, and at prices from \$10 to \$50 each—a pretty good sum in the middle 1970's.

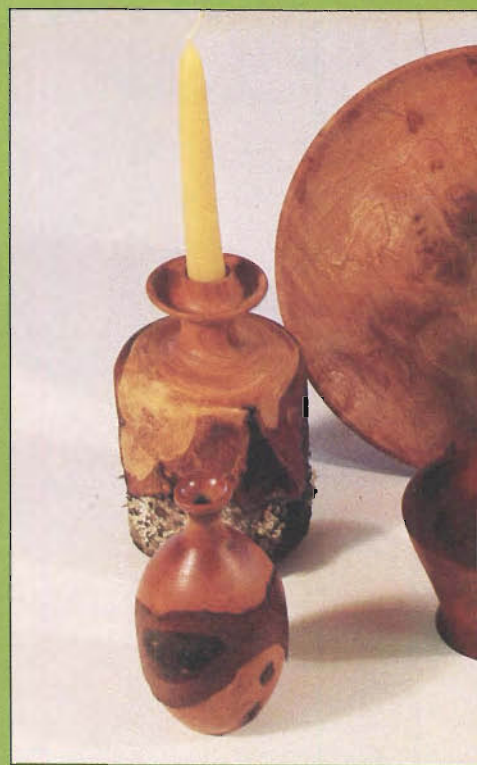
Many of the best pieces you find will be green. Don't worry about it. You may get a little checking, but in things like bottles and candlestumps, that will only enhance the appearance. In bowls you may lose one now and then, but if it's a particularly decorative bowl, the cracks won't matter. Consider it an art piece to be displayed rather than used.

These are essentially faceplate turnings, and you will need certain accessories to do the work. You'll need a small screw-center faceplate with a morse taper shank to fit in your headstock spindle, a 3" diameter faceplate that threads onto your headstock spindle, and a 1/2" or 5/8" Jacob's chuck to fit your tailstock. I'd also like to recommend that you get a 3/4" deep-flute roughing gouge. This gouge is ground square rather than like a thumbnail. It can cut with the bottom or either side of the "U" and is, for my money, the best tool for roughing any job on a lathe.

If your design calls for a 3" or larger diameter base, use the 3" faceplate, particularly if you're turning off center, or have some knobs to knock off before you get to the main body. The 3" gives you better holding power for the roughing operation.

The screw-center faceplate is good for smaller pieces and those that are more symmetrical. With the screw plate it's a good idea to support the other end with the tailstock during roughing. Here's a suggestion for strengthening the

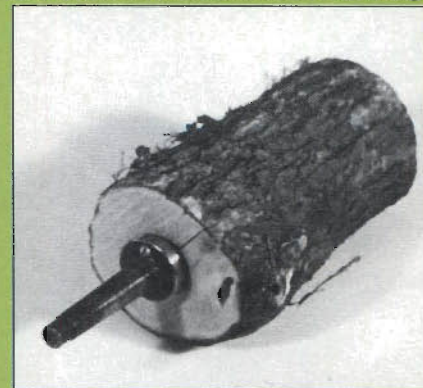
Ken Sadler is a retired furnituremaker in Portland, Oregon.



mounting on this plate: drill a 1/8" hole near the outer edge of the plate; when you have mounted your log on the main screw, put a smaller screw through this hole into the bottom of the blank. This prevents the blank from twisting on the main screw and working loose.

Your wood does not necessarily have to be exactly centered. In fact, you will usually get a more interesting result if it isn't. Nor does the bottom of the blank have to be square with the vertical axis. Such situations often create beautiful patterns that you can't otherwise

Drill a hole in a screw-center faceplate to allow you to drive a second screw into the log.





achieve. Don't worry if you get some vibration because the material's off balance; unless it's excessive, you can work with it. However, be careful as you start your turning; use the slowest speed and advance your tool slowly and hold it firmly, just taking little bites until you can see where you're going. Moving too quickly can result in too deep a cut, and might tear the piece from the faceplate. If the piece is irregular or somewhat long, or if there's quite a bit of vibration, run the tailstock up to support the end during the initial roughing. When you get to detailing that end, pull it back out of the way. If the piece is unusually long, keep the tailstock in place until the very last, light, finishing cuts.

Weed bottles and candlestumps need holes. This, of course, is why you need the Jacob's chuck that mounts in the tailstock. If you're making a bottle with a long thin neck, drill the hole right after you've roughed out the neck area, then leave the drill in the hole as support while you finish the neck. You can do some really nice, delicate work this way, even putting a lovely flared lip on the neck opening. If the drill starts to squeal, just

give it a few drops of light oil. When you make the hole in a candlestump, be sure to cut a slight taper on the sides to fit the candle you'll be using. I also use a large drill (1-1/2") to make the initial hollow in a small bowl. It gives a better start and makes it easier to define the inside surface of the bottom.

All the pieces I've been talking about up to now have been fastened to the faceplates with screws, necessarily about 1/2" long. This limits you to solid pieces or, if you're making bowls or boxes, the bottoms must be at least 1/2" thick. I've made many pieces with thick bottoms. There are times, however, when you want a thin bottom or a thin cross-section throughout. To achieve this requires a different faceplate mounting. Mount a 3/4" thick piece of white pine to your 3" faceplate and turn it to the diameter of the faceplate. Put a very small brad point in the center of this while it's mounted on the lathe. The point should barely protrude from the face. On the surface that is to be the bottom of your bowl, find the center, as close as you can, and position the brad point on this center. Trace the outline of the faceplate onto the other surface. Separate the two and spread yellow glue generously on each of the mating surfaces, keeping within the scribed circle. Place some newspaper on the faceplate so that the brad point sticks through, and fit the faceplate back in its position on the piece to be turned. Clamp them firmly together, and let the glue dry for about 24 hours. If you're turning a chunk of burl or some-

thing similar, rough cut it round on the band saw before mounting. This type of mounting won't withstand the jolts of turning from a square. You can now turn the piece, cutting into the scrap wood if necessary, and when finished, gently separate it from the faceplate using a sharp, long-bladed knife or a thin chisel. I have turned plates and bowls with bottoms as thin as 1/16" using this mounting.

If you want to see what grain patterns you're developing as you progress, just paint the piece with mineral spirits. This will bring out the natural colors of the wood, and then evaporate quickly. You can continue turning even before it evaporates.

When it comes to finishing the pieces, there is again much leeway. Almost anything you put on them (except stain) will bring out the natural colors in the wood and bark. Don't use anything that will result in a glossy finish. They'll end up looking like something you bought at a souvenir counter somewhere. And don't just slap any type of finish on a piece that will contain food. I have found that hand-rubbed mineral oil (not mineral spirits), does a very nice job on the inside of a bowl; on the outside, you can use clear shellac and then a good paste wax on bare wood. Use just shellac on any bark on the piece. When you've left the bark on (entirely, or just in places), be careful how much finish you apply to it. Too much may cause it to curl and peel, then dry in that position. You may want that to happen; I'm telling you about it in case you don't. **PW**

After drilling the hole in the top of a bottle, leave the drill in place to provide additional support.

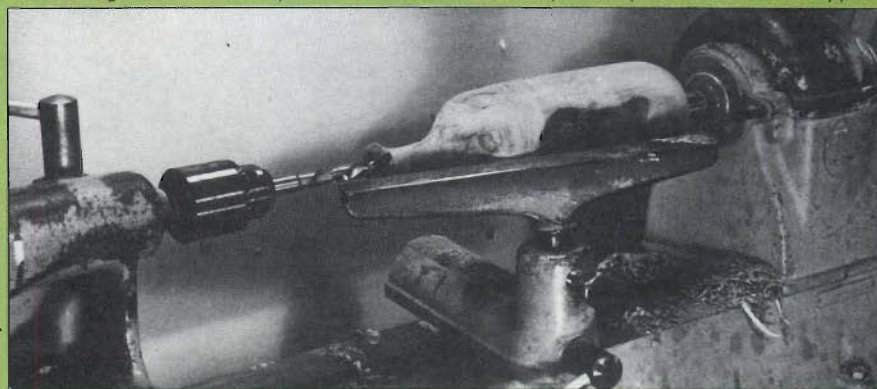




photo by Deborah Porter

fair condition, it still had a hefty price tag on it. I remember as a kid in the forties seeing whirligigs for sale along roadsides—thousands of them, often a bit crude, but brightly painted. Handymen made them to bring in a few extra dollars, and they generally sold for a dollar or so. Recently I saw one go for \$350 at a country auction—the prices for originals are going up.

The metal parts required for this project are the same as for any whirligig, and can be ordered from mail order suppliers like Cherry Tree Toys (Box 369, Belmont, OH 43718, tel. 614-484-4363). A little extra spent on brass parts is well worth it, especially since the wood parts can be made from scrap. You can scrounge up the fittings, but stay reasonably close to the dimensions given in the materials list. Use a straight grain, knot-free hardwood, waterproof glue, and exterior primer and paint.

Cut out the parts and find the full-size patterns for the body (A) and the wings (B) in the PullOut™ Plans in the center of the magazine. Transfer the body pattern and hole locations to the wood and cut out the shape. A band saw is best, but a saber saw or even a coping saw will work fine—after all, the original was made without any power tools. Drill a 5/8" diameter hole for the wing support (C) and a 1/4" hole in the underside edge as shown on the pattern.

Cut the wing support from a 5/8" diameter dowel and glue it to the body. Locate the exact center of each end of the dowel and drill pilot holes for the wood screws.

Roadrunner Whirligig

By John A. Nelson

Like the weather vane, the whirligig is true American folk art. They once depicted all walks of life, performing chores of the day from chopping wood to milking cows. Made in all shapes and sizes, they featured spinning wings, propellers, waving arms, kicking legs, and presented just about every motif imaginable.

They're fun to make and even more fun to paint and finish. Most of the projects we make must be cut exactly to size and shape—but with a whirligig, there are no tight fits, you don't have to be exact, and you can do just about whatever you wish. If, after building this one, you'd like to try your hand at others, see "A Signaling Sailor Whirligig" (*Popular Woodworking* #29, February/March 1986) and "The Sawyers Whirligig" (*PW* #35, February/March 1987).

John A. Nelson is a woodworker and drafting instructor from Peterborough, New Hampshire, and the author of 26 books on various subjects, including *How to Build A Grandfather Clock* (TAB Books, Monterey Lane, Blue Ridge Summit, PA 17214).

This model is a copy of one I found in an antique shop in northern New Hampshire. The original may be only thirty-five years old, as I don't think the roadrunner design was around before then. Though only in

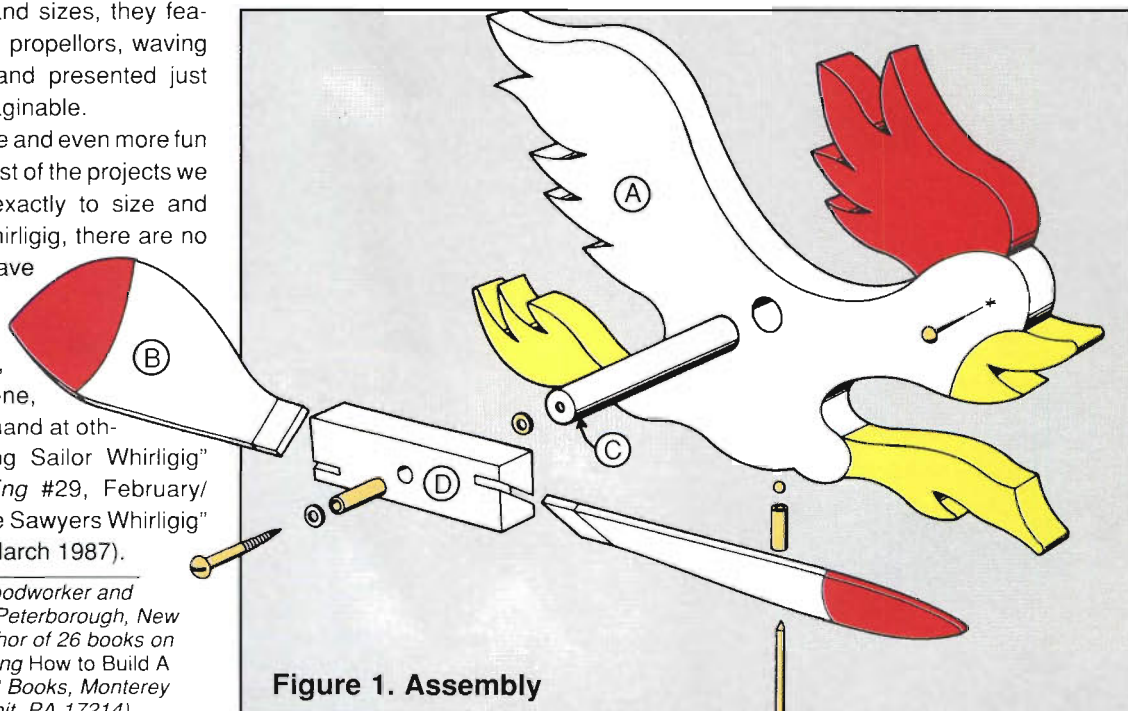


Figure 1. Assembly

[Editor's note: see *Tricks of the Trade* in this issue for an easy way of finding dowel end centers.] Drill a 1/4" diameter hole in each hub (D). Kerf one end of each; then kerf the other end, but in opposite positions as shown in Figure 2.

Transfer the pattern for the wings (B) from the PullOut™ Plans to one piece of wood. Stack all four pieces, tape them together, and stack-saw the four wings. Glue them to the hubs as shown in Figure 1. The flat edges of the wings face in the same general direction and are located on the same side of the hub.

You're now ready for finishing. Prime the wood with exterior primer; then paint with exterior paint—any color combination will look good, but bright colors are

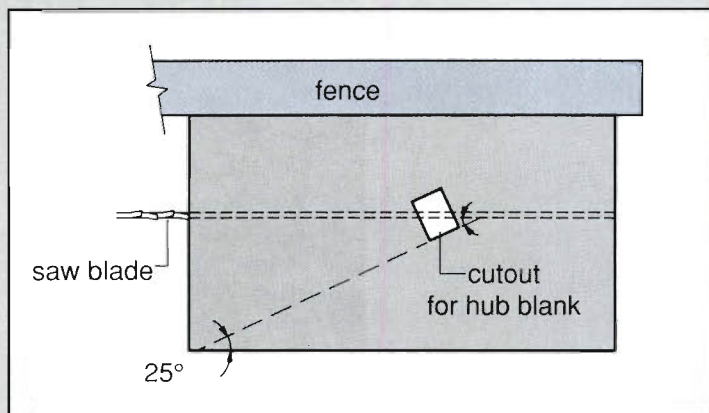
best. When dry, assemble the project as shown in Figure 1. The wings must turn freely, so don't overtighten the wing screws. The pivot bearing, a brass or steel ball, is held in place by the pivot tube.

Attach the eyes, and your bird is done. For the tacks used in the original, I substituted glass eyes from Meisel Hardware (P. O. Box 70, Mound, MN 55364-0700), part #7724. Take care inserting them because they can break easily. You might want to make a stand to display your bird. The one shown is simply a base, 3/4" thick and 7" in diameter. Use a 5/8" diameter dowel, 8-1/2" long, for the post. Attach the pivot nail and your bird is ready to hold his pose quietly inside, or run with the wind outdoors. **PW**

Roadrunner Whirligig					
Cutting List					
Qty	Part	Finished Size			Piece
		T	W	L	
1	A	3/4"	7 5/8"	13"	body
4	B	1/8"	2 1/2"	6 1/2"	wings
1	C	5/8" diameter	4 1/4"		wing support
2	D	3/4"	1"	3 1/2"	hubs
Supplies					
1	#9 X 2" round head wood screw				
1	7/16" washer				
1	1/4" diameter X 13/16" propellor tube				
1	1/4" pivot bearing				
1	1/4" diameter X 1 1/2" pivot tube				
1	5" pivot nail				
2	eyes				

You can purchase from Cherry Tree Toys the following brass parts: screw (part #907), washer (910), propellor tube (915), pivot bearing (909), pivot tube (916) and pivot nail (918).

Jig Journal



Making Whirligig Hubs

By Sterling Guthrie

Once you've caught the whirligig bug, you'll want to make lots. Here's a jig to help cut the kerfs in the hubs safely and efficiently. Begin by laying out a square or rectangle in the center of a 10" length of 2 X 6. Make it the same size and shape as the hub cross-section. Position the square at an angle to the edge of the 2 X 6; the angle depends on the angle of the cuts you want to make—usually 25°. Use a protractor and a T-bevel.

Cut out the square on the band saw or by hand, and place the jig over the lowered blade of the table saw. Adjust the fence so that the blade will run from just inside one corner to just inside the opposite corner of the square. Set the height of the blade to give the depth of cut you want, put a hub blank in the hole, and run the jig across the saw. Then flip the hub end for end and cut the second slot.

Note that you can use the same jig for cutting slots at another angle simply by cutting one edge of the 2 X 6 at a taper so that when the jig slides along the fence, the blade cuts through the square at the new angle. **PW**

Sterling Guthrie is a woodworker in Buckhannon, West Virginia.

Illustrations by Tom Larson

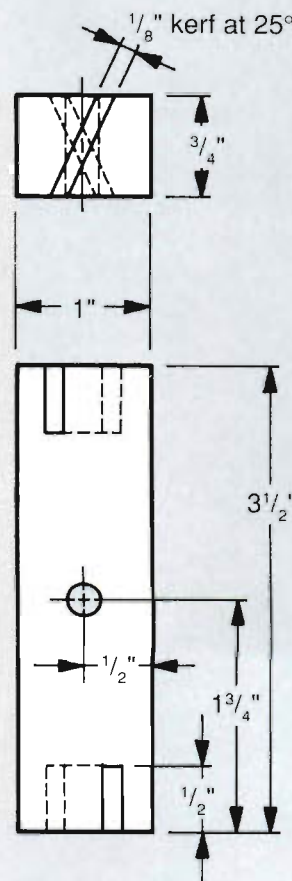
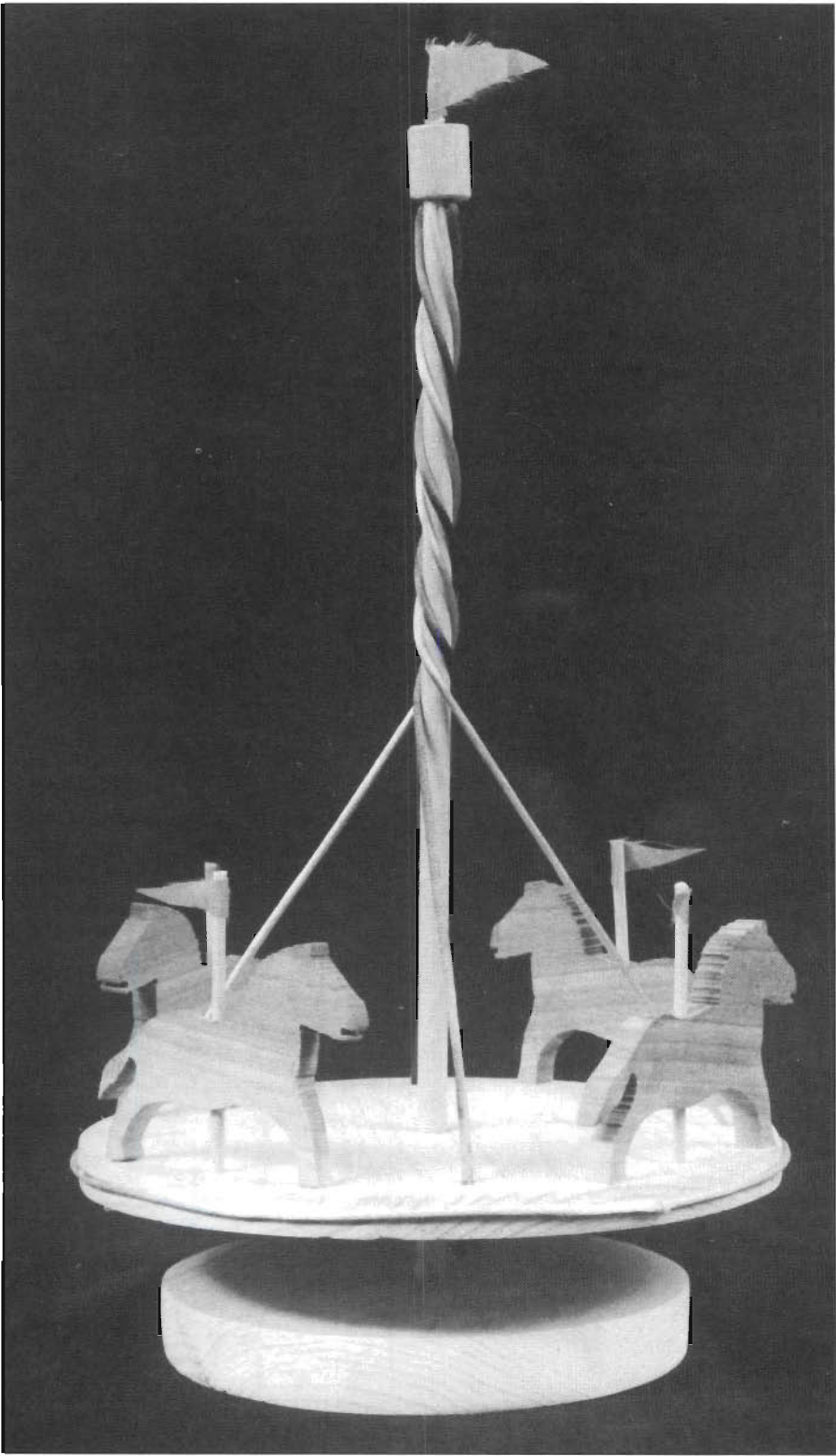


Figure 2. Hub

TOY CAROUSEL



By **B. William Bigelow**

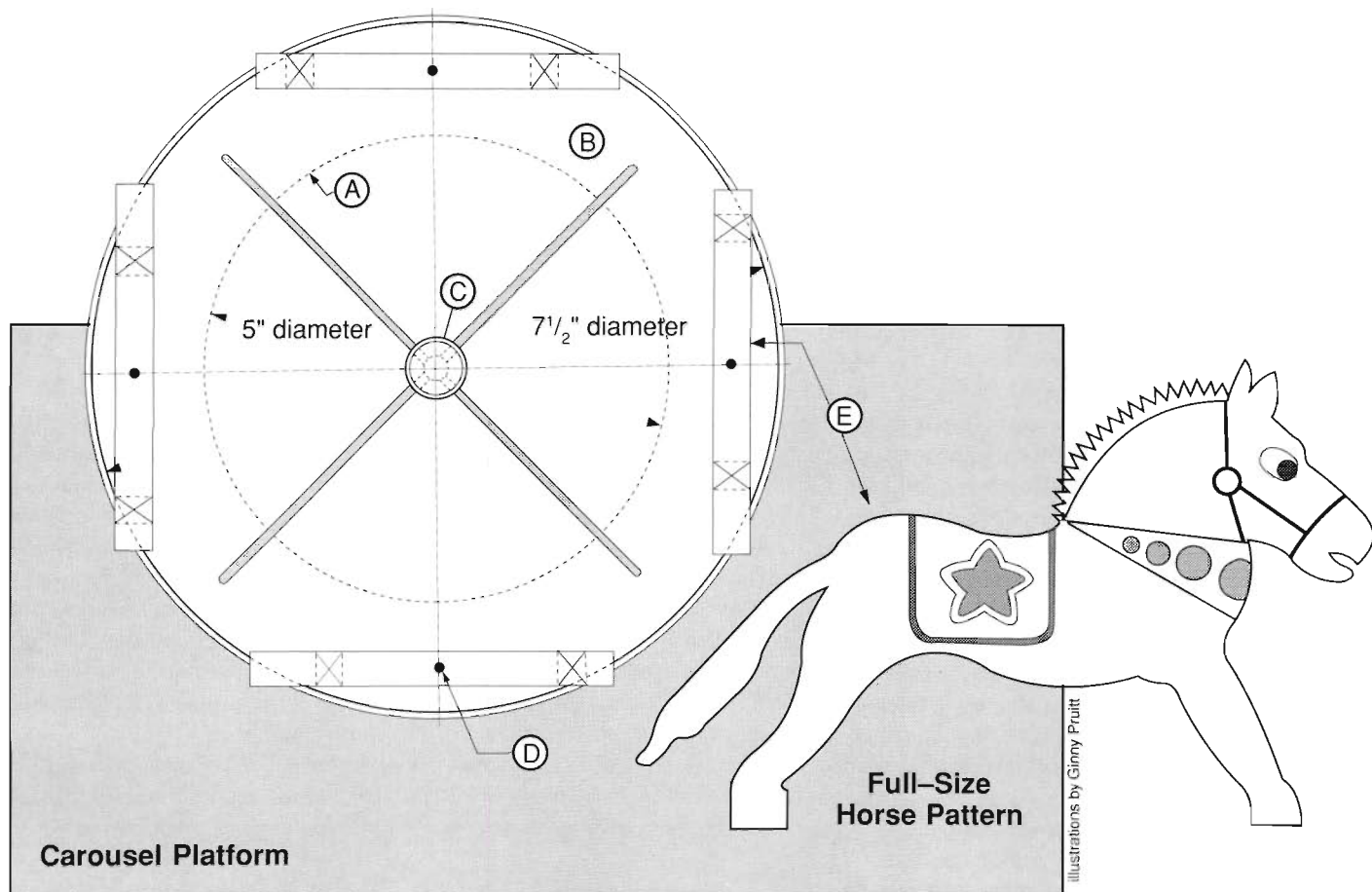
This toy carousel is fun to make and the kids will love it. It winds up around the center pole, and then gravity causes the carriage to wind down and up in the opposite direction. As it rotates, it changes direction again and repeats the motion for up to a minute. Mine is decorated with brightly colored satin ribbon and flashy flags glued on by my children.

The entire project consists of a round base and carousel disk, a few dowels, bandsawn animals, and some colored twine or ribbon. The animals are resawn from a single block of wood.

Start by cutting the base disk (A) and platform (B). Most woods will do, but the base should be fairly dense and heavy. After they're cut out, locate the center of each and drill holes for the center pole (C). The base hole should fit the dowel snugly, while the hole in the platform must be slightly larger so that it fits loosely over the center pole and permits the platform to spin. Locate the remaining holes in the platform (see the Figure) and drill for the horse post mounts (D) and the strings.

B. William Bigelow is a high school woodshop teacher in Surrey, New Hampshire

Toy Carousel					
Cutting List					
Qty	Part	Finished Size			Piece
		T	W	L	
1	A	3/4"	5" diameter		base
1	B	1/2"	7 1/2" diameter		platform
1	C	5/16" diameter		12"	center pole
4	D	1/8" diameter		3 1/2"	posts
4	E	3/8"	2 1/2"	4"	horses
1	F	5/8" diameter		3/4"	cap
1	G	1/8" diameter		1 1/4"	flag pole
Supplies					
2	1/16" diameter X 26" colored twine				



Make the horses (E) on the band saw. Lay a pattern (Figure 2) on a thick block and cut out the horse silhouette. Then slice each individual horse from the master block. Notice in the photo that I positioned a block of wood under the master block while it's being resawn. It supports the small feet of the horse, keeping them from slipping into the throat plate of the band saw.

Drill the 1/8" holes through the horses on the drill press with a fence supporting

After transferring the pattern and shaping the master block on the band saw, resaw the horses from the block one at a time.

the horse. This arrangement will keep the horse parallel to the bit for an accurate post mounting. Sand the side of each horse, but you can leave the edges rough to simulate the horse's mane. Cut the posts from 1/8" diameter dowel, and glue and mount the horses in place.

The center pole must be cross-notched across the top end to accept the colored twine or ribbon. Make the cap (F) covering the notched end by drilling a 5/16" hole in the end of a 3/4" long piece of 5/8"

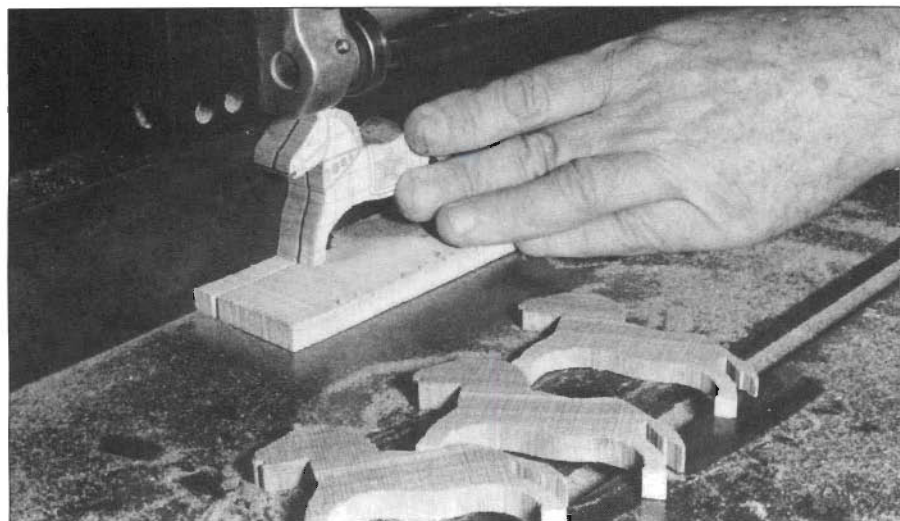
diameter dowel.

If you have trouble drilling a hole precisely in the center of the cap, try this trick. First clamp a piece of scrap wood to the drill press table. Then drill down into the scrap with a 5/8" bit. Now place the cap in the hole and replace the bit with a 5/16" bit. If you don't move the drill press table relative to the bit, the smaller bit will center in the cap, and you will drill the hole accurately.

Make this hole 3/8" deep; then turn the cap over and drill a 1/8" diameter hole for the flag pole (G). Wedge the top cap in place on the center pole rather than glue it so you can take it off to level the carousel platform when necessary.

Paint or stain the carousel now, before attaching the twine or ribbon. Bright colors make this piece attractive to young children. Then knot the end of two pieces of colored twine and feed them up through the holes in the platform, through the cross-notch at the top of the pole, and down through the holes in the opposite side of the platform. Adjust the knots at the ends so the platform is level and slightly above the base. Using two different colors of twine makes for a nice visual effect during winding and unwinding.

Now wind it up and let it go! **PW**



Utility Serving Cart

By Hugh F. Williamson

The raised panel construction of this utility serving cart blends nicely with most types of furniture and is not difficult to do well. The cart offers an easy-to-clean work surface of ceramic tile (or plastic laminate) and two large shelves for concealed storage behind attractive doors. If you like, you can install an electrical outlet for small appliances. Large casters make the cart easily moveable even on carpet.

I made mine from oak, planed to 3/4" thickness, but most any fairly stable wood will do. To shape the stiles, mullions, rails and raised panels, you'll need a shaper, or a table-mounted router capable of taking 1/2" shank bits. I suggest using carbide cope and pattern and raised panel bits. The cope and pattern router bits usually come in a matching set or as a single bit with reversible cutters, and, like the raised panel bits, are available from many sources, including Cascade Tools, MLCS and Freud. It's also possible to make the cuts on a table saw if you use an appropriate set of moulding head cutter-bits specifically designed for the table saw—like the raised panel, cupboard door and rail end cutters available from Sears.

Begin by cutting the boards for the legs (A), rails (B, E, G, H and M), mullions (D, J and K), and panels (C, F, I and L) to length. You may need to adjust the dimensions given in the Cutting List to suit the router bits you're using. In order to minimize end grain splintering, make the coping cuts on the ends of the mullion and rail material before ripping them to their proper widths. Don't cut the door pieces now. After you've assembled the cart you'll measure the door opening, and if any adjustments are needed, make changes in the door parts then.

Set up the router table with the mating bit to mill the panel groove and pattern. Make test cuts in scrap to adjust the depth until the coped ends you cut earlier fit into the stock *with the front faces flush*. Use this setup to rout the edges of the mullions (D, J and K) and rails (E, G and M) once you've ripped them to width.

You'll rout both edges of most of the pieces, but only one edge on the long rails (G and M). Make sure you choose the correct

edge for proper orientation as shown in the Figures.

Two adjoining surfaces on each of the two back legs must be grooved with this setup, but the other two legs get just one groove each. All of these cuts should be stopped 2" from the bottom, and you have to plan them carefully for proper right/left, front/back orientation. The inside surfaces of the front legs require simple mortises to accept the tenons of the front rails (M). While you're cutting the mortises in these surfaces, you might also drill the holes for the pocket hinges that carry the doors. Lay them out according to the template or instructions that come with the hardware. Since the cart will ride on casters, check the method of attachment and drill for them now, too.

You'll also need to round the lower edge corners of the bottom rails so they'll fit comfortably into the rounded stop-cut at the

Utility Serving Cart Cutting List											
Qty	Part	Finished Size			Piece	Qty	Part	Finished Size			Piece
		T	W	L				T	W	L	
4	A	1 3/4"	1 3/4"	26 1/2"	legs	2	L	3/4"	5 1/8"	15 3/4"	large back panels
4	B	3/4"	2 1/4"	15 1/4"	end top and bottom rails	2	M	3/4"	2 1/4"	34 3/16"	front rails
8	C	3/4"	7 1/16"	7 1/4"	small end panels	1	N	3/4"	16 3/4"	34 5/8"	bottom
4	D	3/4"	1 1/2"	7"	end mullions	1	O	3/4"	15"	34"	shelf
4	E	3/4"	1 1/2"	15 1/4"	end rails	1	P	3/8"	3/4"	34"	shelf edging
2	F	3/4"	5 1/8"	15"	large end panels	2	Q	3/4"	1 1/4"	16"	shelf supports
2	G	3/4"	2 1/4"	33 1/4"	long back rails	1	R	3/4"	18"	36"	top
4	H	3/4"	1 1/2"	15 7/8"	short back rails	2	S	3/4"	3"	19 5/8"	top sides
8	I	3/4"	6 7/8"	7 3/8"	small back panels	1	T	3/4"	1 1/4"	37 5/8"	top front
4	J	3/4"	1 1/2"	7"	short back mullions	1	U	3/4"	3"	37 5/8"	top back
1	K	3/4"	2 1/4"	21"	long back mullion	4	V	3/4"	1 1/2"	19 3/4"	door stiles
						4	W	3/4"	1 1/2"	8 1/2"	door mullions
						6	X	3/4"	1 1/2"	13 7/8"	door rails
						8	Y	3/4"	6 9/16"	8 1/4"	door panels
Supplies											
4 pr	SOSS invisible pocket hinges #203					flat head wood screws					
8	1" angle brackets					ceramic tile or plastic laminate					

Dimensions may need adjusting for the router bits you use; dimensions for the top sides, front and back are for through dovetail joints. The hinges are available from many mail order suppliers including Woodcraft, Woodworker's Supply of New Mexico, and Constantine's (see page 56 for addresses).

Hugh F. Williamson is a woodworker in Tucson, Arizona.

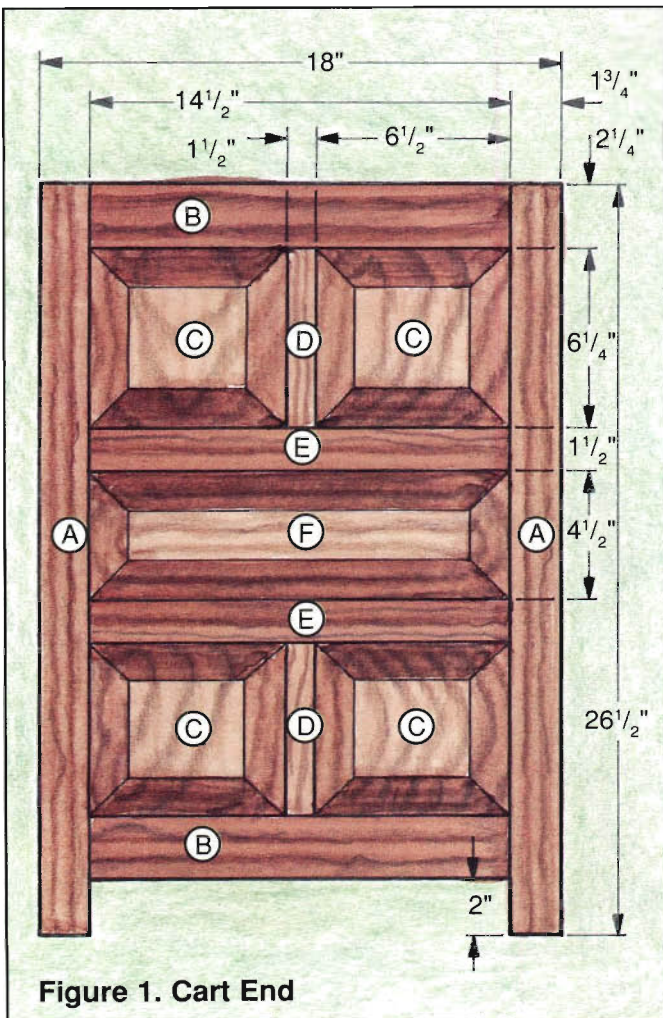


photos by the author

lower ends of the legs. Next, cut a $\frac{3}{4}$ " wide X $\frac{3}{8}$ " deep groove on the inner surface of all four bottom rails to accept the bottom (N). Locate the top edge of this groove $\frac{3}{4}$ " away from the top edge of the rails. You may need to cut these four grooves a bit oversize to allow it to slip in place during final assembly. Sand and dry assemble all the frame and panel pieces to check the fit, and apply your finish before assembly. Try not to get finish on the mating glue surfaces, but do finish all the edges of the panels.

Begin assembly with the two cart ends. Locate all the points where frame members join, and mark them with masking tape as shown in the first photo on page 37. Apply glue only to the stile and rail interfaces, and use it sparingly. Glue and loosely clamp the bottom rail (B) between the two legs first. Slide the small end panels (C) in place. Slip the end mullions (D) into their marked positions; the remaining rails (E) can be angled into the grooves and then straightened. Remove any excess glue in the groove before placing the next panels (F) in place. The panels must be able to float freely as they move with changes in humidity. If, however, you do want to secure the panels in place and still allow for movement, center a small dab of silicone caulk on the top and bottom edges before gluing up the frame. You normally have 15 to 20 minutes before the glue sets up to complete the assembly, check for squareness and clamp.

While the glue is hardening, get the bottom (N), the shelf (O) and the top (R) ready. They can be made of $\frac{3}{4}$ " hardwood plywood or glued up from stock to proper width. If you cover them

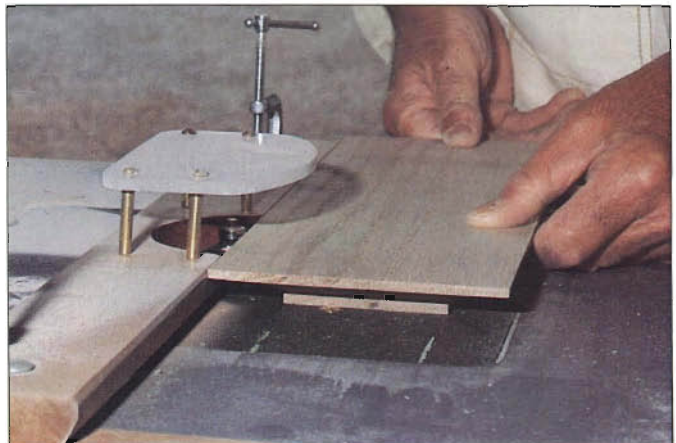


illustrations by Tom Larson and Ginny Pruitt

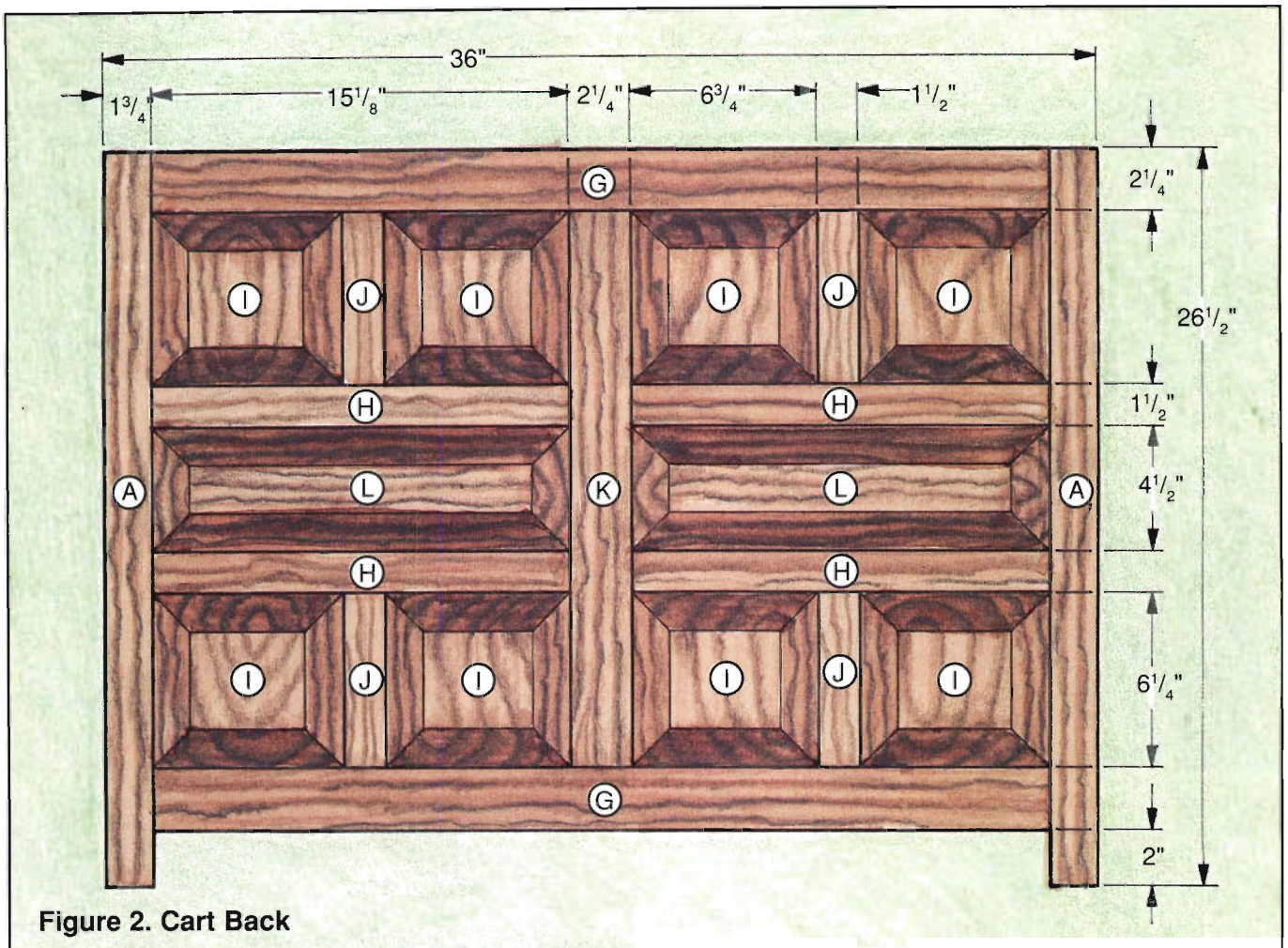
Figure 1. Cart End



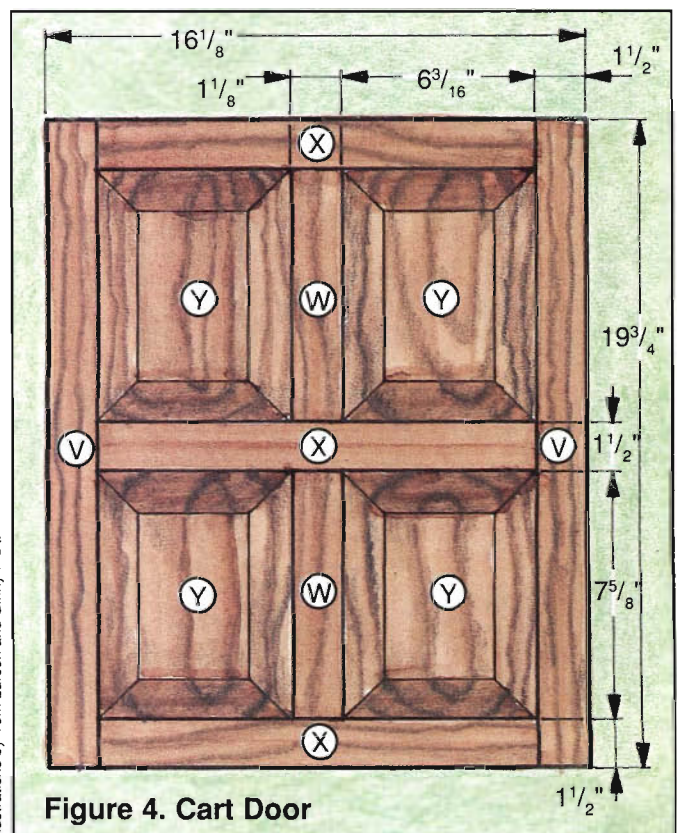
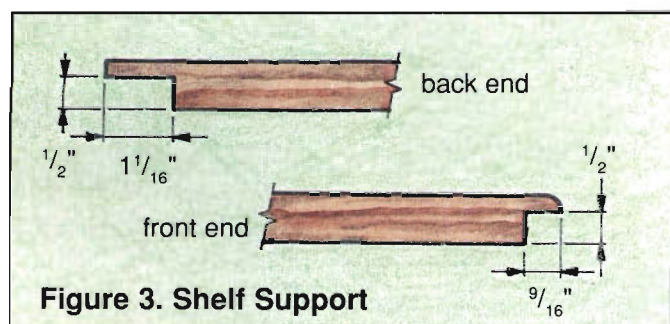
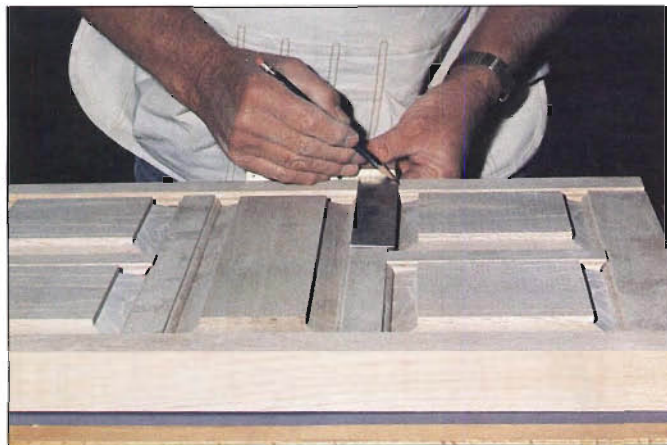
To minimize tear out, make the end grain cut on the rail and mullion stock before ripping it to proper width.



Cut the raised panels on a table saw, with a shaper, or with a table mounted router as I did. Carbide bits will make the cut in one pass.



Dry-assemble the cart ends and mark the locations of all the rail and mullion intersections.



Illustrations by Tom Larson and Ginny Pruitt



photos by the author



Masking tape marks the glue points, permitting easy assembly without marring the finish.

Note the installation of the shelf and shelf support. Angle braces at the bottom corners add strength.

The Sloss recessed hinges make a neat invisible hinge joint.

Install the magnetic catches on a 3/4" wooden block on the cart floor so they clear the bottom rail.

with plastic laminate (I used ceramic tile on the top), make them from the less expensive fir plywood. Cut 1-1/8" X 1-1/8" notches in the corners of the bottom (N), and 13/16" X 13/16" notches in the four corners of the shelf (O). Cover the raw plywood edge on the middle shelf with a hardwood facing strip (P). Next, rabbet the ends of the two middle shelf supports (Q) as shown in Figure 3 so they'll stretch between and lap over the inside edges of the legs. Once you've unclamped the end subassemblies, position the shelf supports along the inside surfaces, and screw them to the legs as shown in the photo above.

Now assemble the pieces for the cart back. Dry fit them on a large flat surface and make sure the assembly will slide readily into the leg grooves. Sand and finish the back pieces, if you haven't already, and glue them up as you did the

cart ends. While the back is drying, make certain that the tenons on the front rails (M) fit nicely into the mortises in the two front legs.

Final assembly will go quicker and easier if you have an extra pair of hands for the job. After checking the fit, glue and clamp together both ends, the back, the bottom shelf, and the front rails. Make sure the assembly is square by measuring diagonals and adjust the clamps if necessary. Once the glue has hardened, remove the clamps and fasten the top (R) and the shelf (O) in place with glue and screws. Use two 1" angle braces and 3/4" flat head wood screws to secure the bottom to the legs.

The corner joints of the top edging pieces (S, T and U) can be done in a number of ways—simple rabbet, spline, or finger joints—depending on your skill, equipment, and the appearance you want. I joined my top edges with

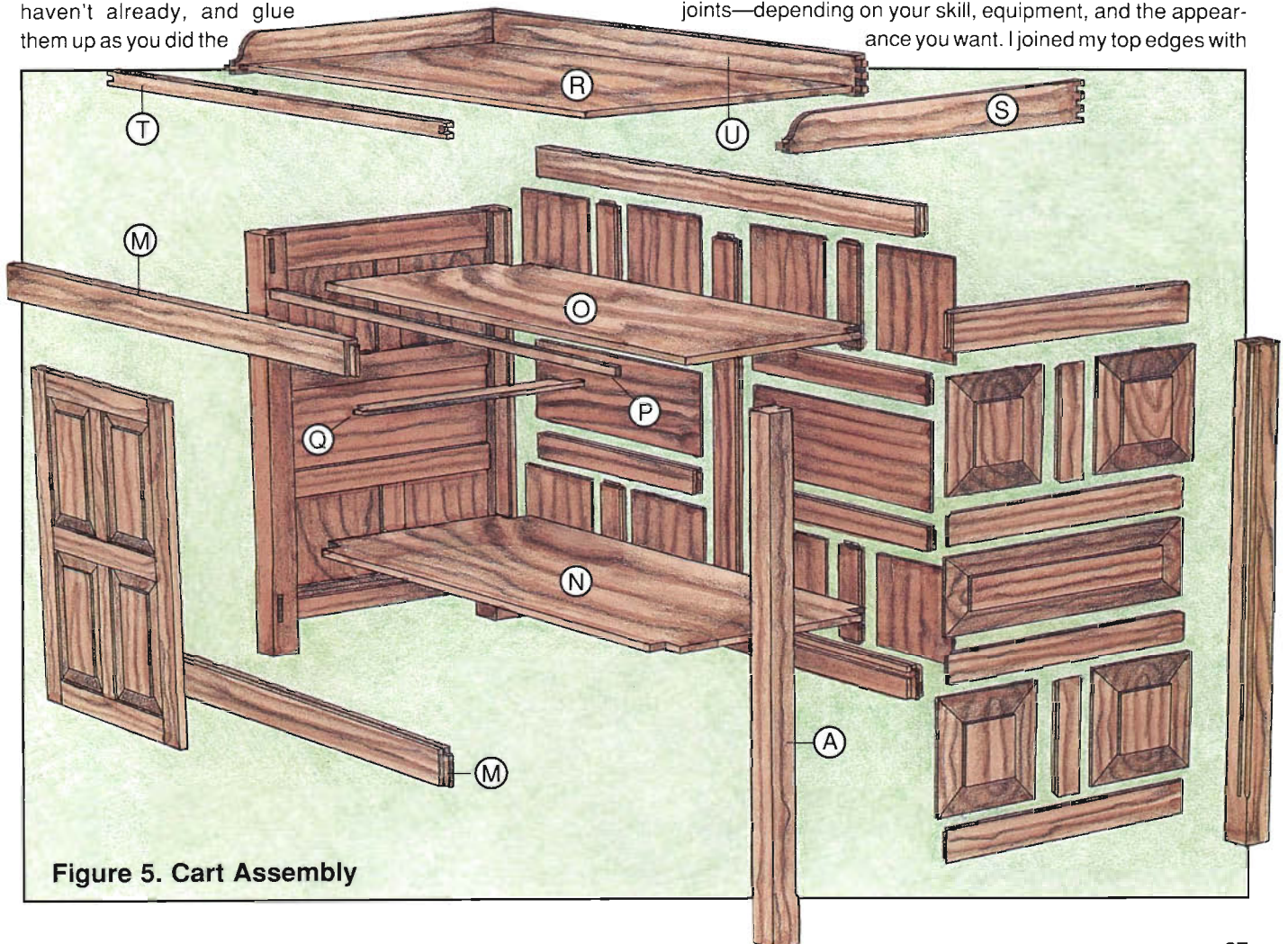


Figure 5. Cart Assembly



photos by the author



The front corners of my cart top are joined with through dovetails and then rounded over with a 1/2" router bit to form a smooth, clean corner.

through dovetails. These can be cut with a router and jig, or marked, sawn and chiseled out by hand in the following manner. First, lay out and cut the tails on the front ends of the side pieces (S) and the ends of the back pieces (U) as shown in the photos. Mark the pins directly from the tails that you just cut. Use a saw and chisel to remove the waste from between the pins. [Editor's note: for more detailed instructions on cutting dovetails, including the making of a useful dovetail marking gauge, see Popular Woodworking #38, August/September 1987. To order a copy, see this issue, page 23.] If you haven't cut dovetails before, first practice on scrap wood—no one gets them completely right the first time!

Sand the top edge pieces and join them to the cart on all four sides with recessed screws. Glue the corner joints at this time and clamp them lightly with the pieces screwed in position on top of the cart. Cover the heads with matching or contrasting dowel plugs. You can also drill a 3/8" hole into each of the four front mortise and tenon joints and form a pinned tenon joint with ei-

ther matching or contrasting 3/8" doweling.

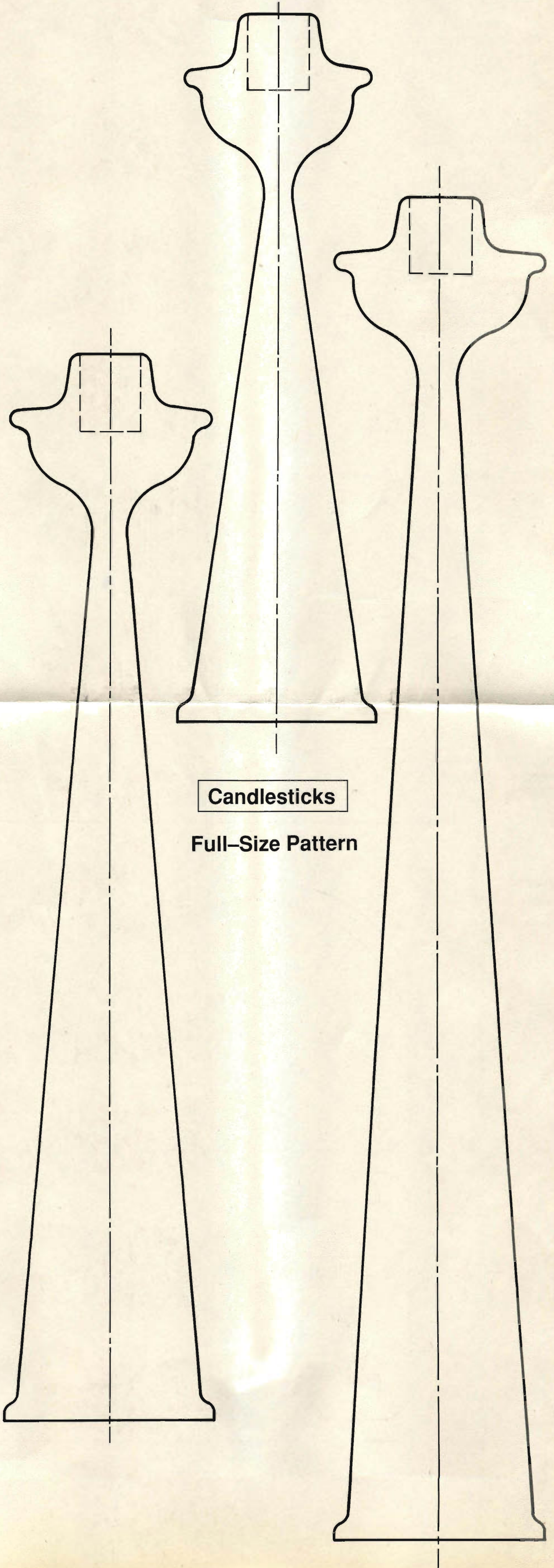
Now measure the door opening and make any needed adjustments in the dimensions of the door pieces—stiles (V), mullions (W), rails (X), and panels (Y). Cut them to size and shape, and finish them. Dry fit, glue and clamp them together as you did the cart ends and back. Screw in the hinges according to the manufacturer's instructions, complete the top with ceramic tile if you haven't already installed plastic laminate, and install the casters. **PW**



PullOut™ Plans

Popular Woodworking #56
September 1990

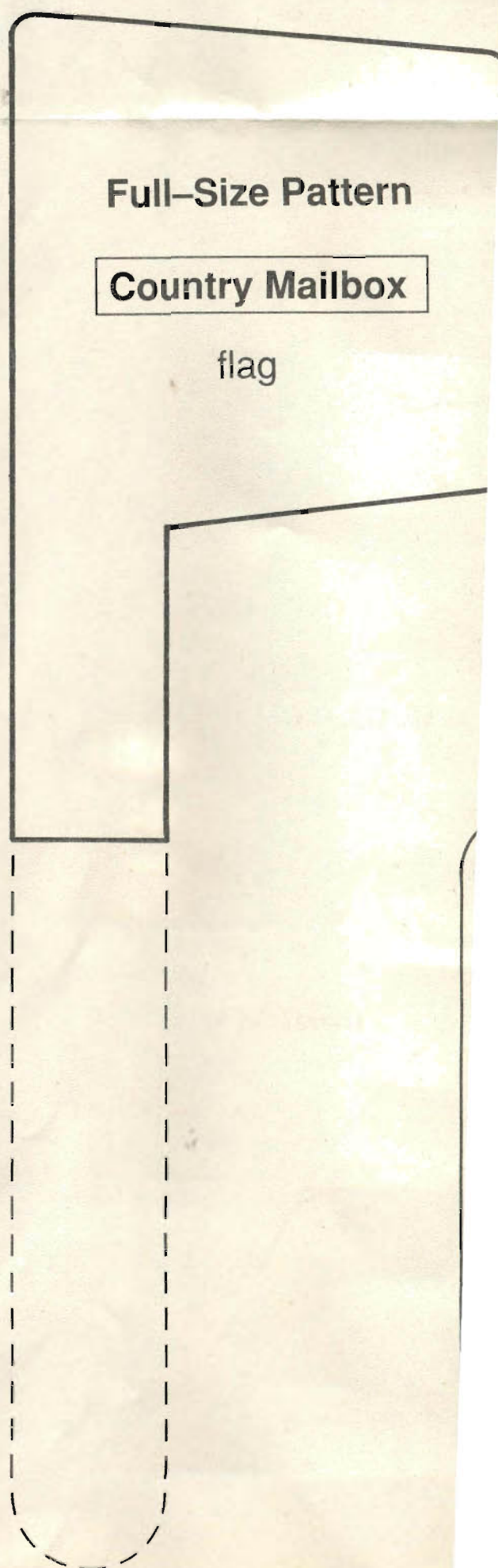
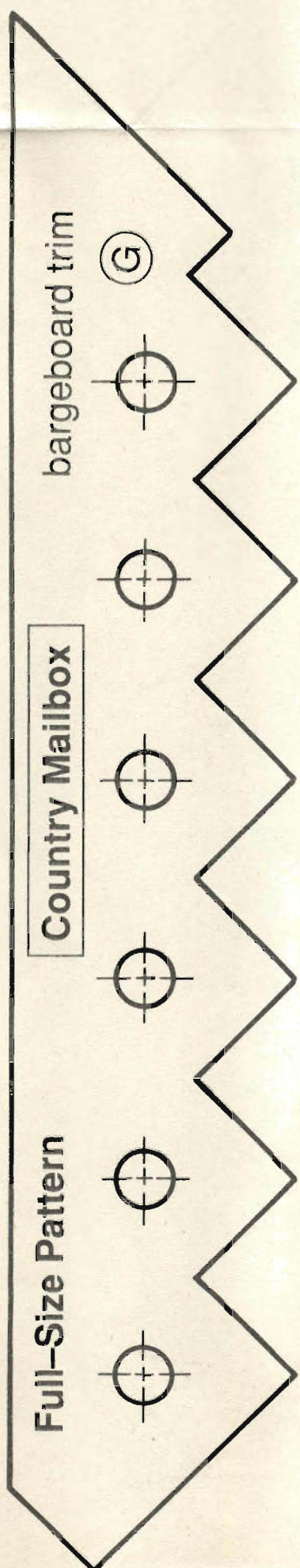
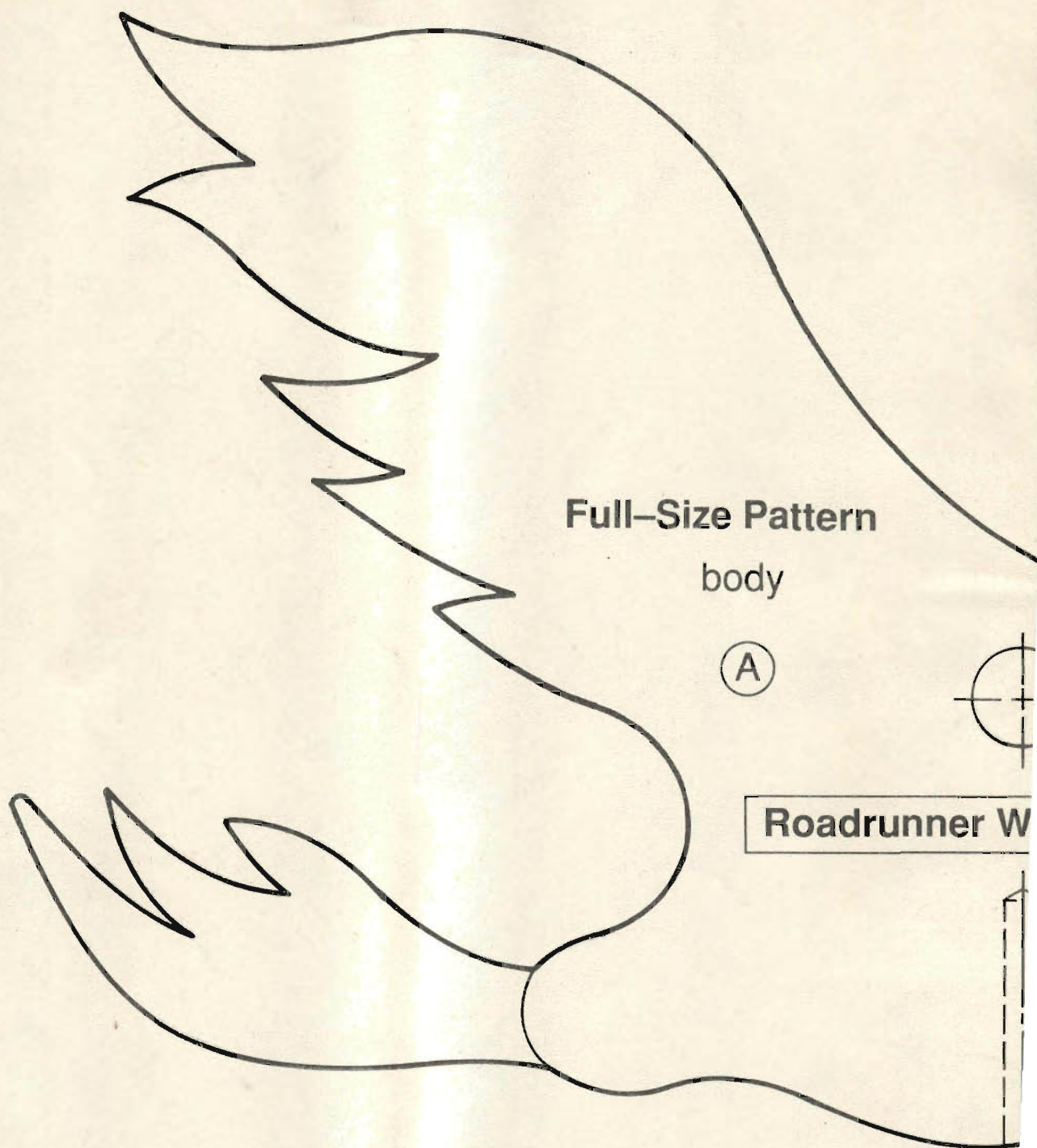
Pages 39—54



Candlesticks

Full-Size Pattern

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



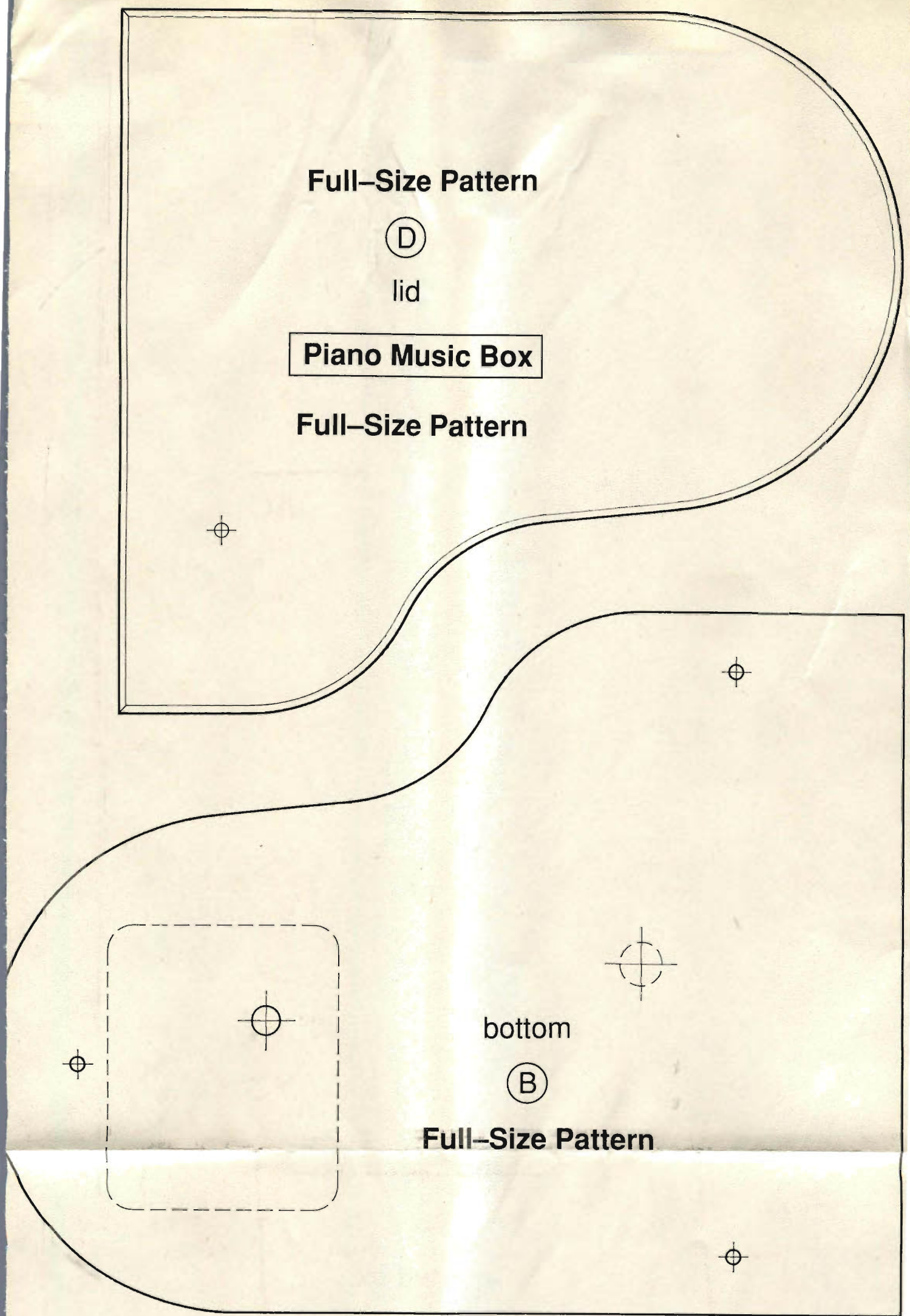
Full-Size Pattern

Ⓓ

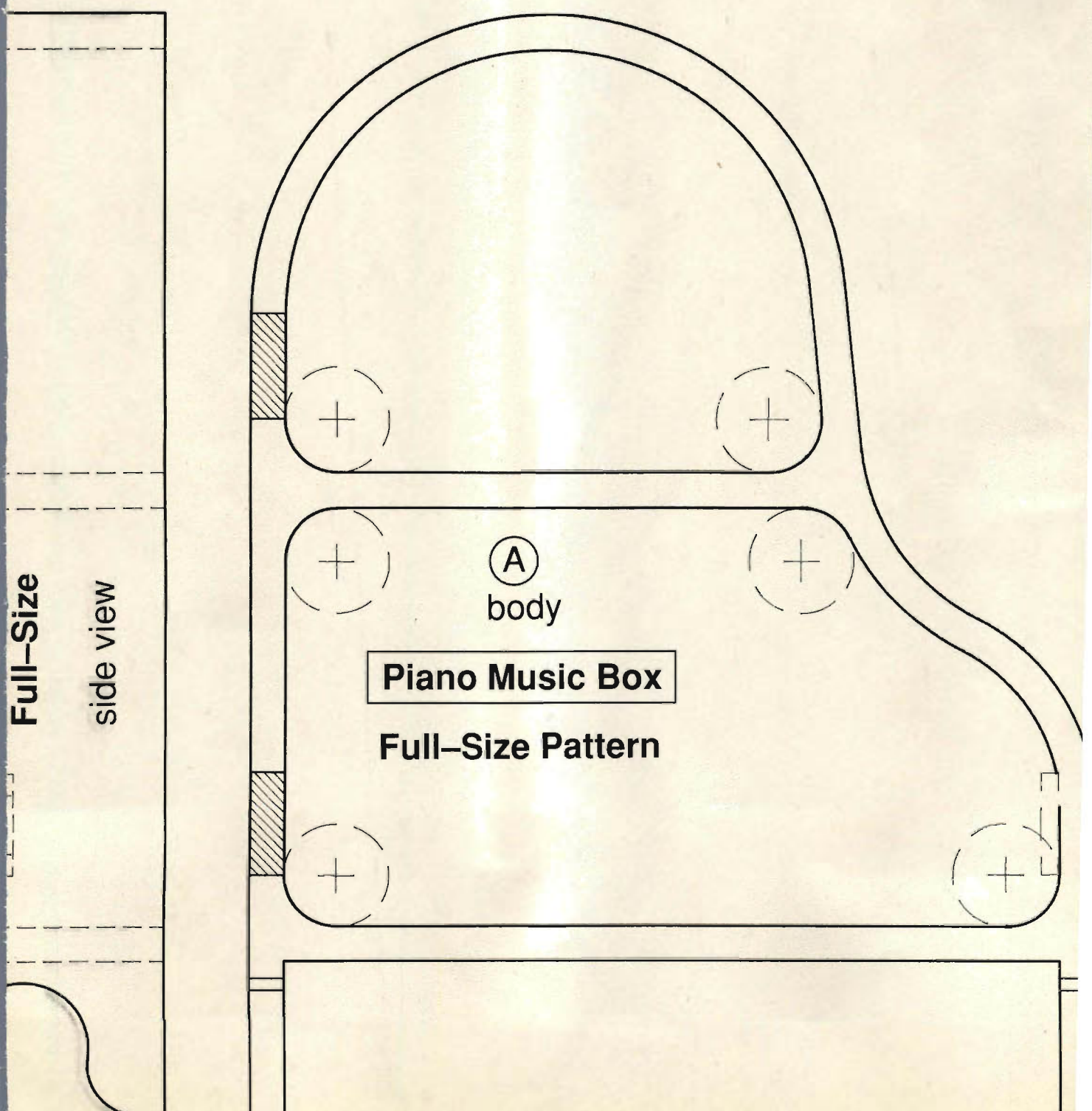
lid

Piano Music Box

Full-Size Pattern

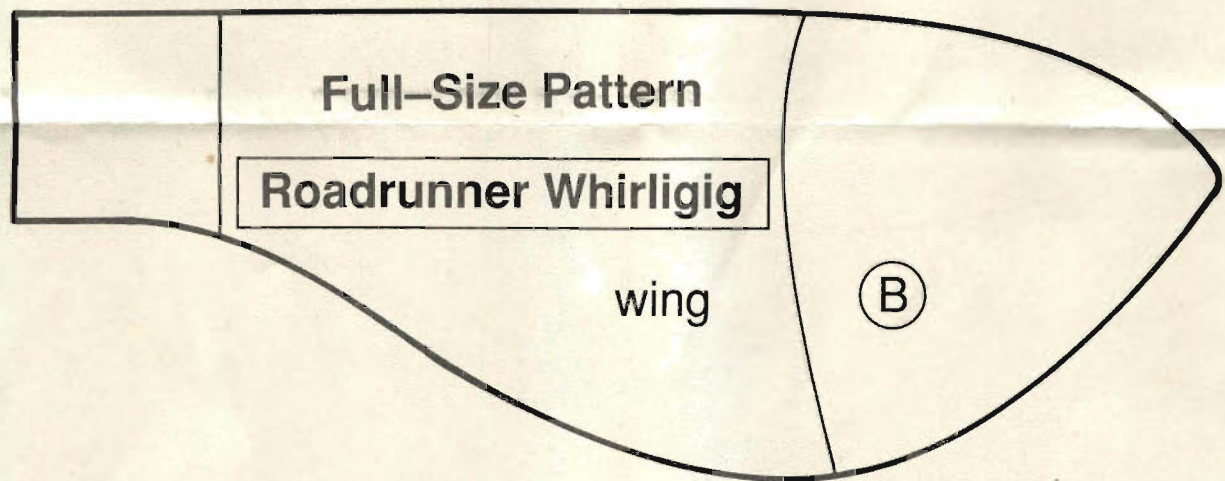


Full-Size Pattern





Whirligig



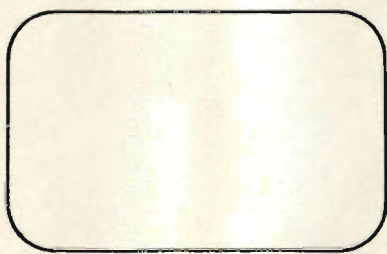
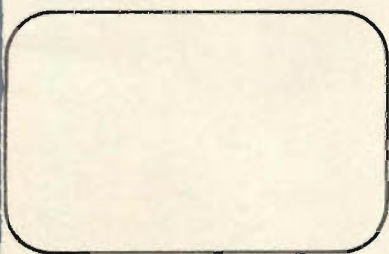
Full-Size Pattern

Roadrunner Whirligig

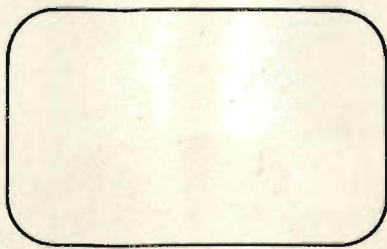
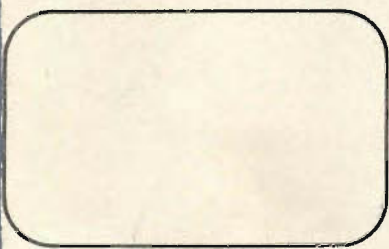
wing

(B)

Country Mailbox



Full-Size Pattern



(F)

window frame



photo by Deborah Porter

Piano Music Box

By John A. Nelson

This little piano not only plays its own tune, but holds jewelry and small valuables, makes a fine gift, and is easier to build than it looks. Having played the piano professionally in northern Vermont for over 20 years, I feel I know what a piano should look like—even when reduced to the size of a music box. This one is a scaled down version of my Yamaha conservatory grand, and with the addition of Meisel Specialty Hardware's miniature keyboard, it looks real.

Cut all the pieces as dimensioned in the Cutting List, and sand all surfaces. Take care in this step—most of the parts are small, fairly delicate, and must fit together precisely for a pleasing final ap-

pearance. On the top surface of the body (A) carefully lay out the full-size pattern you'll find in the PullOut™ Plans. Mark the centers for the six 3/4" diameter holes and drill them; they'll help you saw the interior curves accurately. Make the interior cuts with a coping or scroll saw, and sand all inside surfaces before proceeding further. Carefully cut the outer surfaces, maintaining the 1/4" thick wall all around as indicated in the pattern. Locate and make the two 3/4" wide, 1/16" deep notches for the hinges. Adjust these dimensions if you use hinges that are different from those specified in the Supplies List. Sand all over, but keep all edges sharp.

Using the bottom pattern in the Pull-Out™ Plans, lay out and cut the bottom (B). Mark the location of the support base (C) and the music box. Locate and drill the three 1/8" and one 1/4" diameter holes as

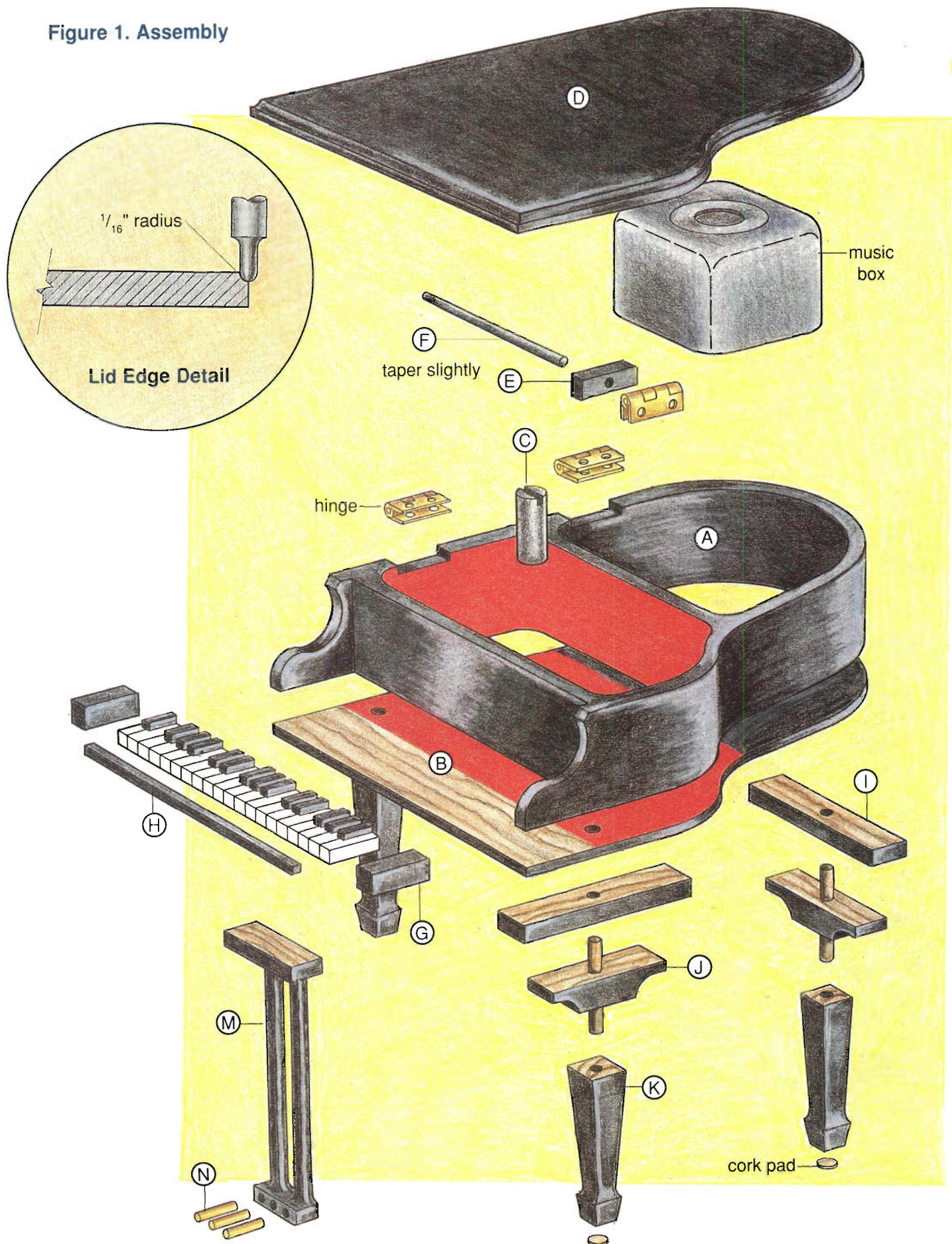
indicated. Then glue the bottom to the body, and when the glue is dry, sand the joining edges to form a smooth one-piece, vertical surface all the way round the body.

Use the full-size lid pattern to lay out and cut the lid (D). It must be the same size as the body. Using a small 1/16" radius router bit, make the cut around the top surface shown in the detail in Figure 1. On the underside of the lid, locate and drill the 1/8" diameter hole, 1/16" deep, as indicated on the pattern. Sand all over. Temporarily attach the lid to the body and bottom assembly with two hinges. Be sure to drill small pilot holes so the wood won't split when you add the brass screws.

Drill a small hole in the spacer (E), taper the lid support (F) slightly, and glue the support in the hole. Attach it to the body with a hinge. Again, drill pilot holes first so the screws won't split the wood.

John A. Nelson teaches drafting, pens books, plays piano and bangs wood in northern New Hampshire.

Figure 1. Assembly



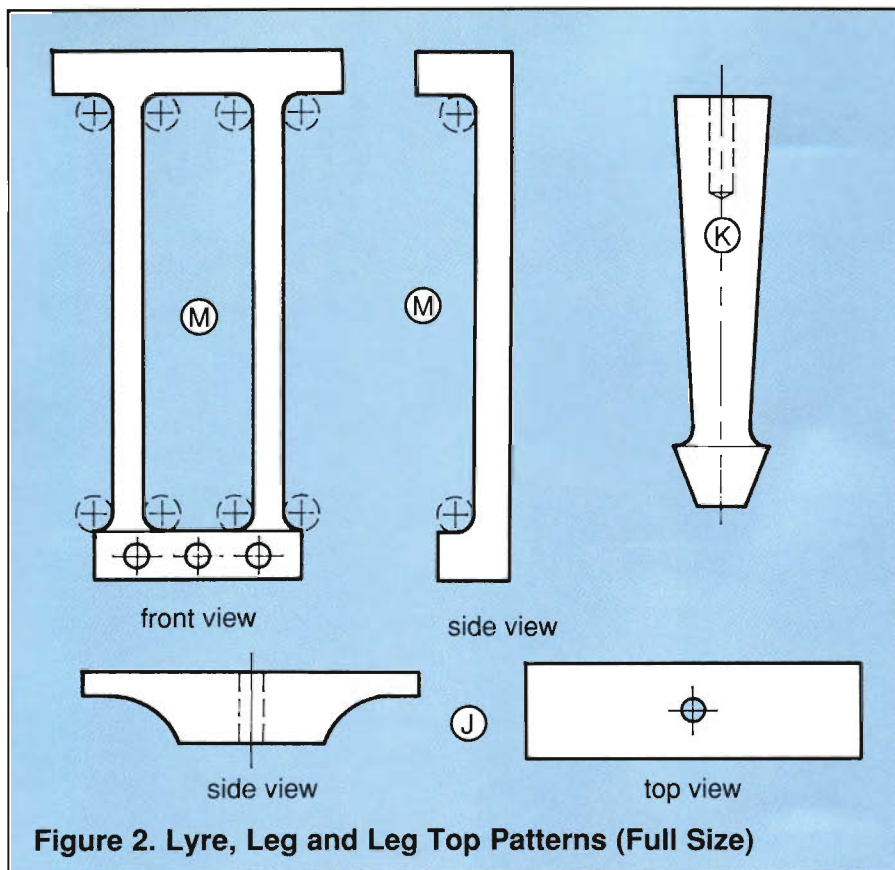


Figure 2. Lyre, Leg and Leg Top Patterns (Full Size)

Now cut a notch about 1/8" deep in the support base (C) and glue it in place. Position it so the lid support rests comfortably in its notch when you close the lid.

Center the music box inside as indicated. Check the fit; you'll glue it in place after painting the piano. Dry fit the keyboard, the keyboard spacer (G), and the front board (H) as shown in Figure 1. When you have a good fit, glue the spacer and front board in place—but don't glue the keyboard in until the piano is painted.

Carefully drill 1/8" diameter holes through the exact center of the three leg supports (I), leg tops (J) and legs (K). Shape the leg tops with the scroll saw using the full-size pattern in Figure 2. Then lay out the leg pattern on two adja-

cent sides of the legs. Cut it out on one surface, tape the scraps back in place for support, and cut the pattern on the other surface. Glue the leg parts together as shown in Figure 1, and using the leg pins (L), glue each leg assembly into the holes drilled earlier in the piano case bottom.

To make the lyre (M), locate and carefully drill the three 1/8" diameter holes indicated on the pattern in Figure 2. These will hold the pedals (N). Also drill the eight 3/16" diameter holes in the indicated corner locations to help in cutting the lyre shape with the coping or scroll saw. Draw the pattern on the front and side of the stock and cut the side view first. Then tape on the scrap and cut the front view. Sand the lyre all over and glue in the three

Piano Music Box					
Cutting List					
Qty	Part	Finished Size			Piece
		T	W	L	
1	A	1 3/8"	6"	7 7/8"	body
1	B	1/8"	6"	7 7/8"	bottom
1	C	3/8" diameter		7/8"	support base
1	D	1/4"	6"	6 3/4"	lid
1	E	1/4"	1/4"	3/4"	spacer
1	F	1/8" diameter		3 1/4"	lid support
2	G	3/16"	5/16"	15/16"	keyboard spacers
1	H	1/8"	1/8"	4 7/8"	front board
3	I	1/4"	5/8"	2 3/8"	leg supports
3	J	3/8"	1/2"	1 3/4"	leg tops
3	K	1/2"	1/2"	2 1/8"	legs
3	L	1/8" diameter		1 1/4"	leg pins
1	M	1/2"	1 1/2"	2 3/4"	lyre
3	N	1/8" diameter		5/8"	pedals
Supplies					
3	hinges with screws				
1	music box				
1	keyboard				

Illustrations by Tom Larson and Ginny Pruitt

pedals. Then glue the lyre in place.

Now remove all the hinges and prime all the wood surfaces—except for the two areas where the music box and the keyboard will be attached. Sand lightly all over and apply two coats of high gloss black paint. Sand again with a fine sandpaper when the paint is thoroughly dry. Wipe the surfaces clean and apply a final high gloss top coat. Lightly steel wool (#0000) when dry and apply a coat of paste wax. Your piano should have a high quality, glossy black finish just like a real grand piano.

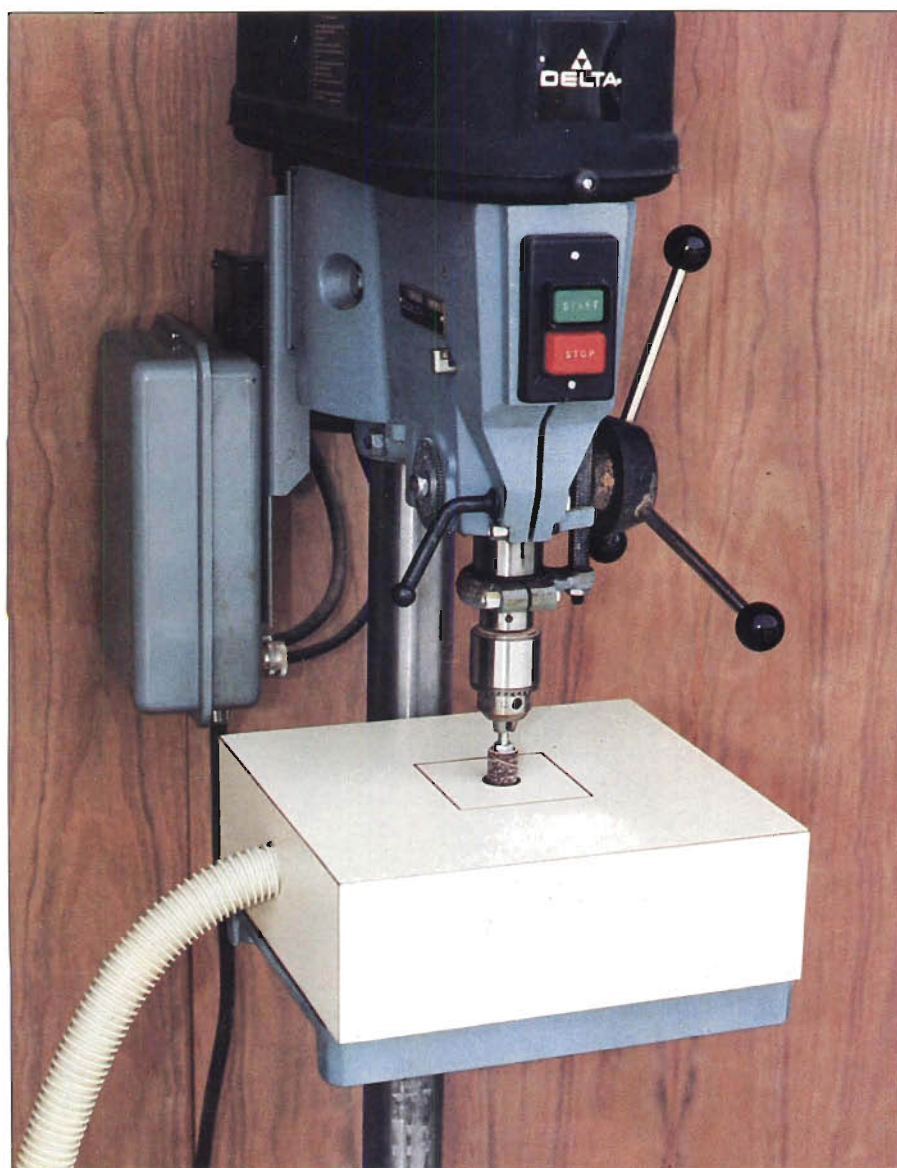
I painted the interior of my piano music box red. Here's a great place to apply spray flocking or a similar finish such as Suede-Tex, which is available by mail from the suppliers listed in the box below. Paint the pedals with a brass enamel.

You're ready to glue the music box and keyboard in place. Re-attach the lid and lid support with their hinges. Cut and glue three 3/8" diameter cork pads to the legs. Your piano is now ready to sing—and hide small valuables—for years to come. **PW**

Sources

You can obtain the same miniature keyboard I used from Meisel Hardware Specialties, item #1648. Its dimensions are 4-7/8" X 3/4" X 3/8". The hinges I used also came from Meisel, item #125, as did the music box movement, item #586. Music box movements are available in a wide variety of melodies and from many other mail order sources, including Woodcraft Supply Corp. (210 Wood County Industrial Park, Box 1686, Parkersburg, WV 26102, tel. 800-225-1153) and Cherry Tree Toys (Box 369, Belmont, OH 43718, tel. 614-484-4363).

Order Suede-Tex from Woodcraft, Cherry Tree, Woodworker's Supply of New Mexico (5604 Alameda Place NE, Albuquerque, NM 87113, tel. 505-821-0500), and Constantine's (2050 Eastchester Rd., Bronx, NY 10461, tel. 212-792-1600).



photos by the author

The Cube Sanding

sanding drum, is cut in the center of each surface. As the sanding drum penetrates the top surface of the cube, the hollow area accommodates it to the desired depth.

As Figure 1 shows, the rest of the system consists of an enclosed box or canister housing the cube. To support the top surface and stabilize the cube, the square chamber surrounding it has four vertical sides fixed between the top and bottom surfaces of the canister. When you insert the cube in the chamber, the top surfaces of the cube and canister are always perfectly flush. All you need for dust collection is a section of plastic pipe connecting the cube chamber with the outside wall of the canister. Magnets embedded in the base secure the unit to the drill press table, thus eliminating the need for clamps.

Cubing the Holes

A 4" x 4" x 4" hollow cube is the minimum size necessary for a sanding drum 3" in diameter. I used white pine surfaced to a thickness of 3/8" for the six sides of the cube (A, B and C); plywood works well, too. Cut them as dimensioned in the Cutting List. Cut rabbets across the inside end surfaces of side pieces (E) as shown in Figure 2.

Locate the centers of the six cube sides and draw on each a circle 1/4" larger than the diameter of the sanding drum assigned to it. Use a scroll saw or sabre saw with a sharp, thin blade to cut the holes. My old drum sanding system was used for the last time to sand the edge of each hole to the pencil line.

Rabbet joints secure four corners of the cube, while butt joints, glue and brads serve the rest. You may need to make

By Dick Dorn

For years my students and I followed the generally accepted procedure for using sanding drums on the drill press. We'd clamp a board elevated with wooden cleats to the drill press table and lower the sanding drum into a hole in the board so the entire length of the drum could eventually be utilized.

This method works, but not without some disadvantages. Sanding drums range in size from 3" in diameter down to 1/2", and ideally the hole in the board or auxiliary table should just clear the drum. In other words, if you have six sanding drums, you need six auxiliary tables and six sets of cleats. In addition, to secure the

Dick Dorn is a woodworker and high school shop teacher in Olewein, Iowa.

table to the drill press you need several clumsy clamps. Changing from drilling to sanding and back to drilling can be a hassle.

Improved versions are more efficient; for instance, a single auxiliary table with a variety of holes saves time. And so does a single auxiliary table with interchangeable throat plates to fit each of your sanding drums. The project described here, however, lets you use six different drums on the drill press without the hassle of cleats and clamps, or a collection of auxiliary tables or interchangeable throat plates. Best of all, it includes a built-in dust collection system.

The heart of the system is a single hollow cube with six perfectly equal surfaces. A hole, fitting around a particular

and Canister Drum System

minor adjustments with a sanding block, try square and straight edge so the cube is perfectly square.

Covering the Cube

I covered mine with plastic laminate in order to make it stronger, cleaner, and professional-looking. Although it's not difficult, applying plastic laminate must be done in a step-by-step sequence. Cut each piece of plastic laminate about 1/2" larger than needed. A table saw with a carbide-tipped blade works well. Clamp a narrow board to the rip fence if the laminate slips under it. Then apply the laminate pieces to the cube surfaces with contact cement. Begin with the side with the largest hole; then cover the surface on the opposite side of the cube.

Keep in mind that contact cement is unforgiving, and perfect alignment of the laminate is necessary before surfaces meet. Allow more than enough time to dry. Trim the excess with a router and a flush-trim carbide bit. Use a flat mill bastard file on the edges to make sure they're flush. Allow the toe of the file to slide on the flat surface with light downward pressure on the forward stroke. When the surface is perfectly flush, the file will slide easily. Trim and file each pair of opposing surfaces until the cube is covered. Hold the file at a slight angle when filing an edge which joins a previously laminated surface. Keep the angle of the file consistent and watch for a thin layer of contact cement under the laminate to shear off.

Now expose the six drum holes. Locate the center of each side, drill a pilot hole large enough to let in the router bit, and trim the laminate neatly to the edge of each hole.

Illustrations by Tom Larson

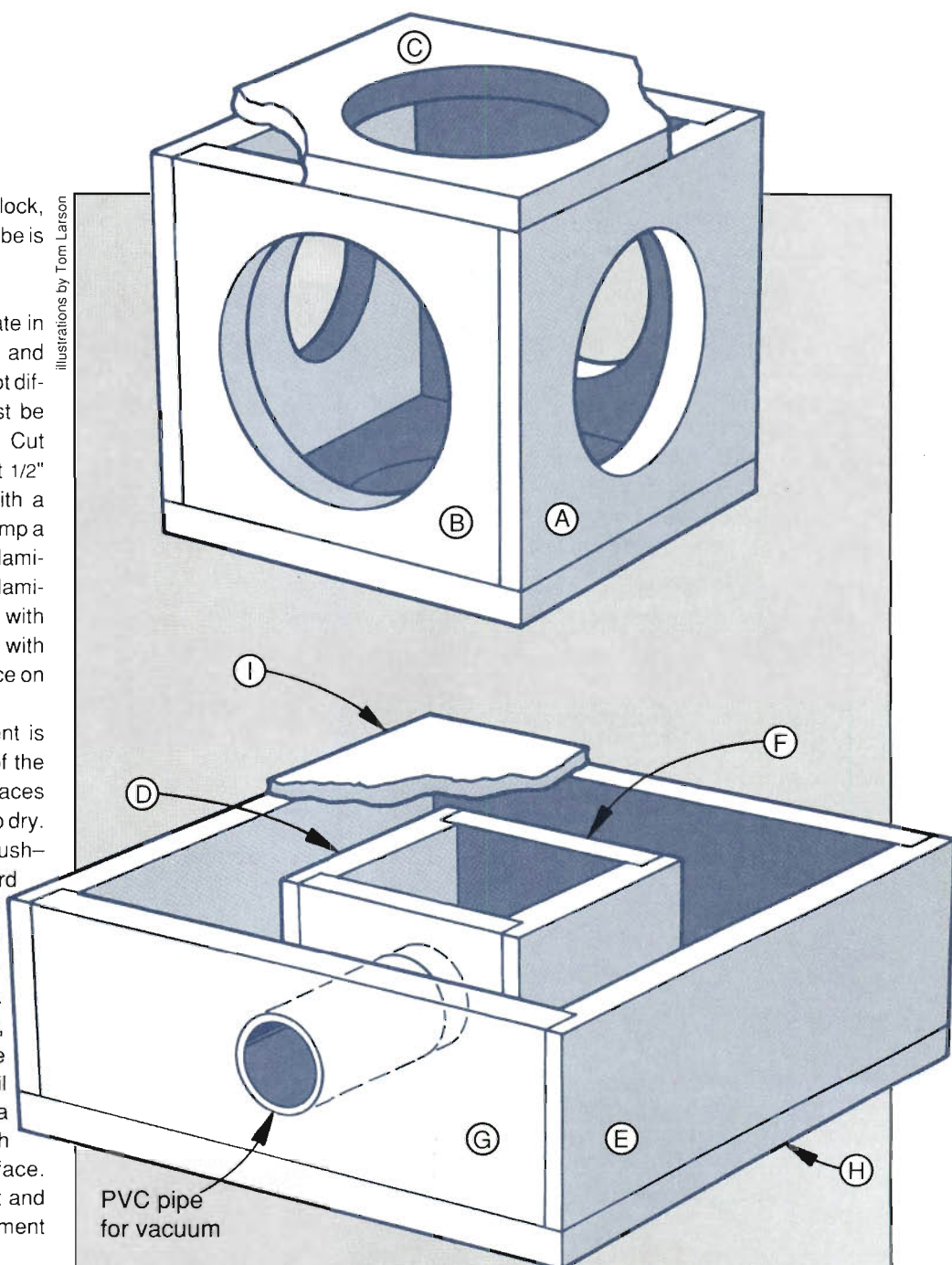
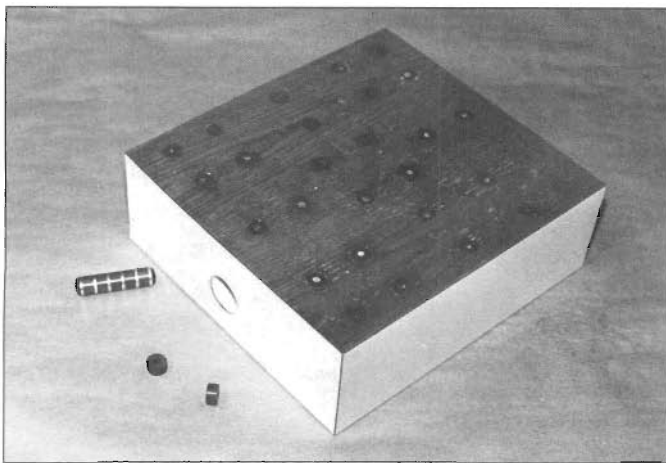
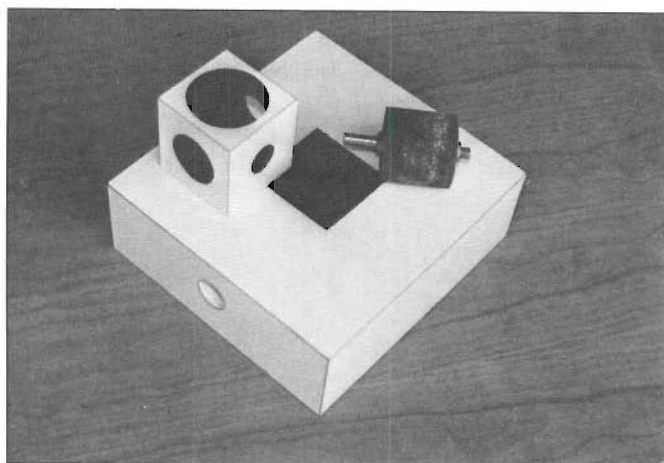


Figure 1. Cube and Canister Assembly



Six cow magnets will yield more than enough cylindrical segments to hold the cube and canister assembly firmly on the drill press table.



To use the 3" drum, turn the cube surface with the largest hole face up, and lower it into the canister, as the photos on the next page show.

Canister and Chamber

Cut the ten pieces of wood needed for the canister and cube chamber as described in the Cutting List and Figures. Use the completed cube to test dimensions—everything must fit around it properly. It must slide readily into the chamber with just enough clearance, and the top surfaces of the cube and canister must always be flush. The thickness of both plywood and plastic laminates varies, so verify that the sides of the canister and cube chamber are cut to the correct width. To do this, place the cube on a flat surface; next to it, stack a side piece on edge, a scrap of the plywood you'll use for the canister top, and a piece of plastic laminate. These three pieces stacked must be the same height

as the cube. Cut rabbets across the inside end surfaces of the chamber sides (D) and canister sides (E) as shown in Figure 2.

Locate and cut the two vacuum ports in the center of one chamber end (F) and one canister end (G), using a piece of the plastic pipe as a pattern. Join the sides of the chamber and the sides of the canister with glue and finish nails, squaring each subassembly precisely.

Magnetic Base

To eliminate having to clamp the canister to the drill press table, I bought six cow magnets, available through veterinarians. Each consists of five round magnetic segments that are $\frac{3}{4}$ " in diameter and $\frac{3}{8}$ " thick. You'll need enough to hold the unit

Cube and Canister Drum Sanding System					
Cutting List					
Qty	Part	Finished Size			Piece
		T	W	L	
2	A	$\frac{3}{8}$ "	$3\frac{1}{4}$ "	4"	cube sides
2	B	$\frac{3}{8}$ "	$3\frac{1}{4}$ "	$3\frac{5}{8}$ "	cube ends
2	C	$\frac{3}{8}$ "	4"	4"	cube top and bottom
2	D	$\frac{3}{4}$ "	$3\frac{13}{16}$ "	$5\frac{5}{8}$ "	chamber sides
2	E	$\frac{3}{4}$ "	$3\frac{13}{16}$ "	$13\frac{1}{2}$ "	canister sides
2	F	$\frac{3}{4}$ "	$3\frac{13}{16}$ "	$4\frac{7}{8}$ "	chamber ends
2	G	$\frac{3}{4}$ "	$3\frac{13}{16}$ "	$11\frac{3}{4}$ "	canister ends
1	H	$\frac{3}{4}$ "	$12\frac{1}{2}$ "	$13\frac{1}{2}$ "	canister base
1	I	$\frac{1}{4}$ "	$12\frac{1}{2}$ "	$13\frac{1}{2}$ "	canister top
Supplies					
6	cow magnets (or the equivalent)				
1	$4\frac{3}{4}$ " PVC pipe, diameter to fit your vacuum hose				
	plastic laminate				
	brads and finishing nails				
	epoxy				
	anti-skid tape or floor covering				

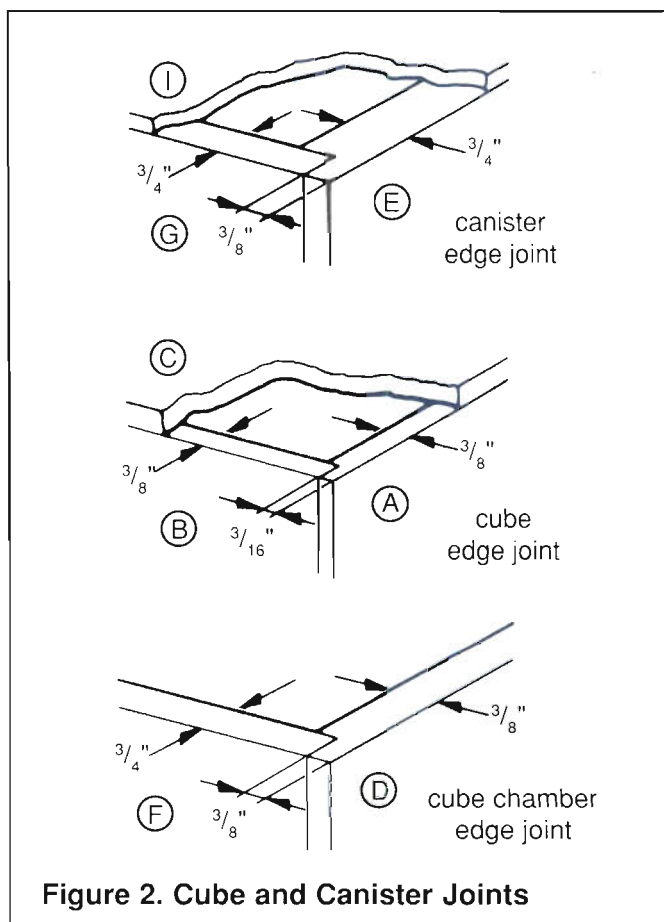
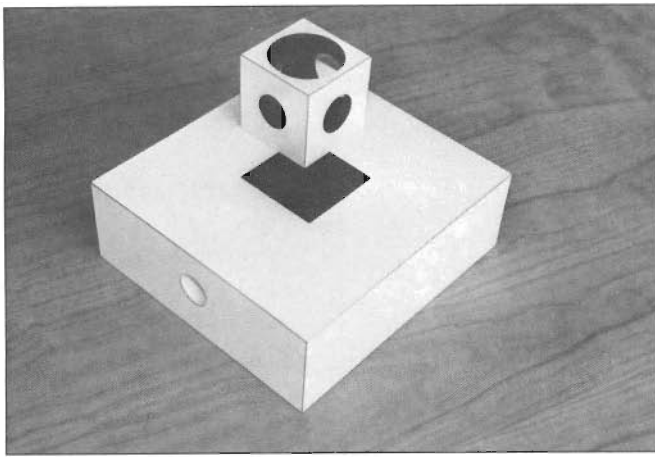


Figure 2. Cube and Canister Joints



securely during sanding, but too many magnets make positioning it difficult. After a little trial-and-error, I found that 28 to 30 segments produced the proper balance. If you use different magnets or modify the project and alter its weight, you may need to add or remove a few.

Any pattern that distributes the magnets equally across the surface will work. Use a Forstner bit to drill the holes in the canister base (H) slightly deeper than the thickness of the magnets. Next, mix enough epoxy glue to embed four or five at a time. They must be flush with the base surface, and you can assure this by laying a flat steel sheet across the base before the epoxy hardens. The magnets will then align themselves. When the glue is dry, remove the sheet and fill the holes in the center of each magnet with wood filler. Sand the base, seal it with lacquer, and apply strips of anti-skid tape (made by 3M, Brady and others, and available in hardware stores). Excess may be filed off with the mill bastard file using a downward stroke.

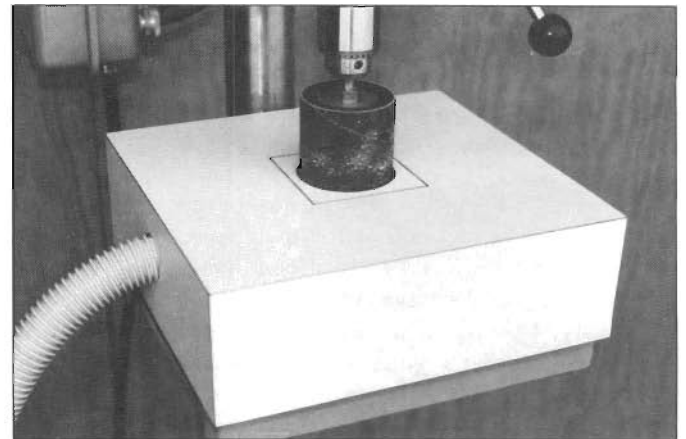
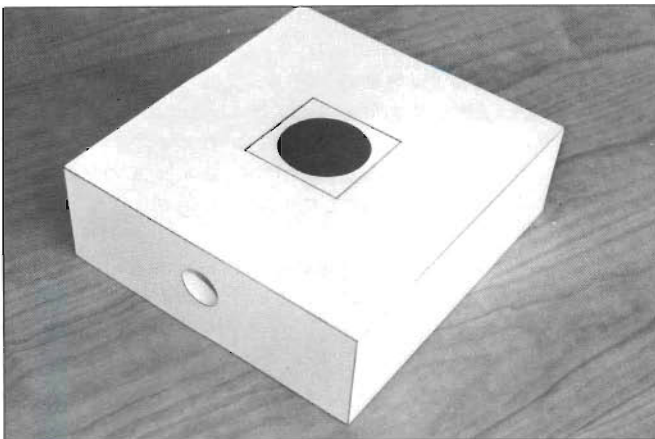
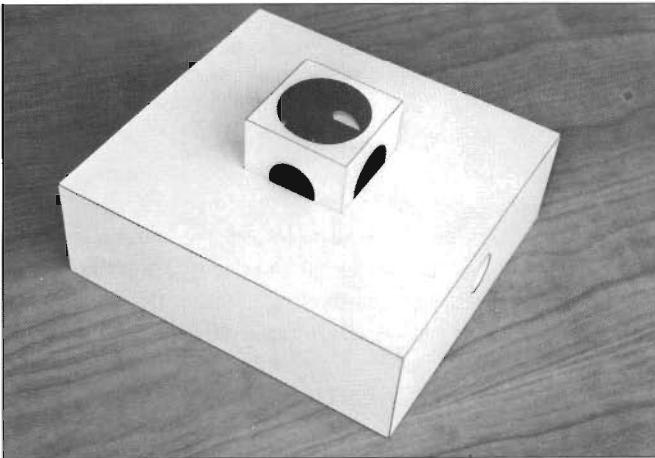
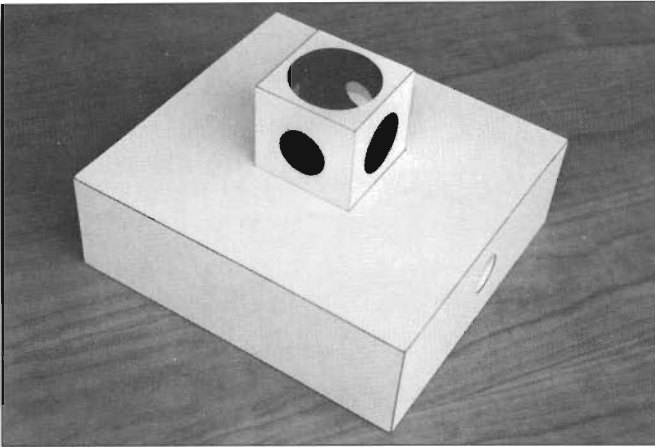
Assembling the Canister and Cube Chamber

Draw diagonals on the base's inside surface, center the chamber, and glue and clamp it to the base. Glue and clamp the canister subassembly to the base also. Cut a piece of plastic pipe to run from the inside of the chamber to the outside of the canister wall, and glue it in place with epoxy. The canister top (I) can now be glued and clamped in position. Don't cut the hole in the top where the cube is inserted just yet.

Prepare the canister for plastic laminate by sanding all surfaces until they're flush. Mark on the bottom of the canister directly under the center of the vacuum port so you can locate it after the laminate is applied. Laminate the ends, then the front and rear walls, and finally the top surface of the canister.

Drill pilot holes for the router bit through the center of the top and the center of the vacuum port, and trim the laminate to the edge of the port. Before you insert the router bit into the pilot hole on the top surface, set it deep enough to cut through both the laminate and the plywood top. Use a downward stroke with a mill bastard file to shape the chamber walls until the plywood and laminate are flush. The same file will help square the rounded corners left by the router bit. I painted the inside of both the cube and the cube chamber with a black enamel.

Regardless of how you insert the cube in the chamber, one of its six holes will always align with the chamber's vacuum port. When a vacuum hose is inserted into the canister port, it will pull enough air through the confined hollow of the cube to make sanding operations virtually dust free **PW**



The Upside Down Art Deco Linen Cabinet

by David M. Camp

Did you ever design a cabinet upside-down?

Sometimes things work out differently than you think they will. Sometimes, in the process of building a piece, you encounter difficulties you hadn't foreseen, or you have new ideas for improvements. Sometimes the finished piece demands to be seen from an altogether different perspective.

Seat-of-the-pants furnituremaking isn't for everyone; it requires a rather carefree attitude. You have to have a creative vision, a pile of wood, and some free time in which to experiment.

The Vision

My friend, Walter Rockholt, occasionally has long periods of free time. His business, Home Repairs R Us, is dependent upon the ringing of the telephone for income. Throughout the year he takes calls for jobs such as decks, room additions, kitchen remodels, or his specialty—wooden window construction. He knows he gets less work in the winter, so he squirrels away some money—and some hardwoods—to get him through the slow periods. Last winter, he had a substantial pile of quartersawn white oak, some cherry, a little bit of black walnut, and a four-month period when jobs were few and far between. He decided to make himself a linen cabinet.

Walter begins the design process by sketching shapes on scratch paper. When he showed me the sketch of the shape he had decided upon for this cabinet, I was immediately intrigued (see Figure 1). The tapered geometric design seemed reminiscent of the art deco style. He wanted to mix his hardwoods in the lamination of the doors, so that a walnut stripe would run parallel to the angle of the sides and all the grain would converge at the center like a "V." The center section would be oak, and cherry would provide a nice expanse of pink on the outside of the walnut stripe.

"How do you hinge the doors?" I asked, thinking they would scrape the floor and not open if they were hinged on those sloping sides in the way that a traditional (non-sloping) wardrobe would be hinged. His answer was simple enough, "Hinge them at the center." My next questions were not so easy to answer. "How do you make a box that shape? How do you join the sides together?" Walter, who's used to working carefully but fast,

David M. Camp is the Editor of Popular Woodworking.

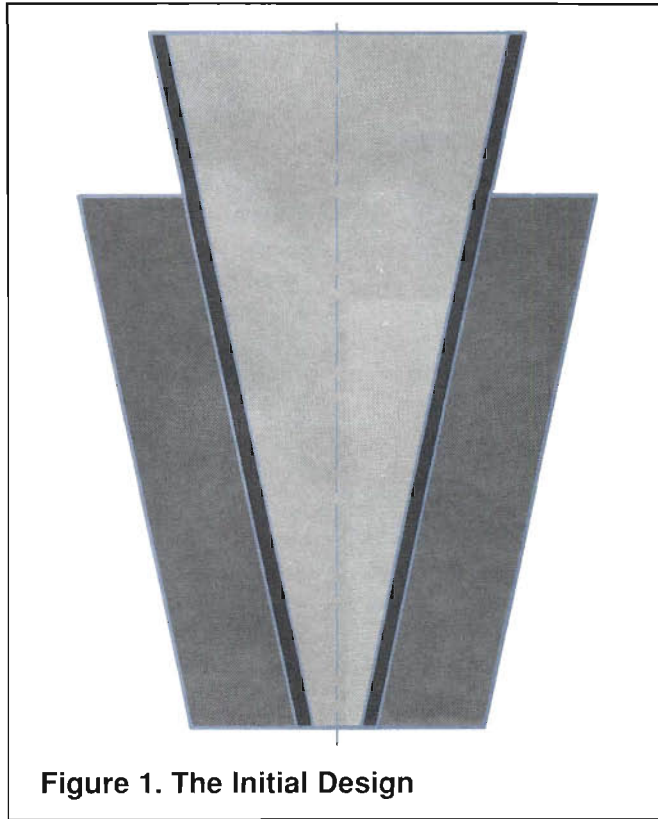


Figure 1. The Initial Design

replied half-jokingly, "drywall screws."

After some discussion, we settled on finger joints. Dove-tails—especially considering the angles involved—would be too difficult. Furthermore, we felt that the shape of the tails would conflict with the overall shape of the piece. Walter was envisioning oak, walnut, and cherry laminations for the sides, creating stripes that would encircle the carcass. We felt that the straight lines of finger joints would complement the straight lines of the stripes.

By this point, I was committed to building this cabinet with him—not only for the fun and challenge involved, but for the purpose of sharing the process with *Popular Woodworking* readers. I also wanted to make sure Walter didn't start

to find the handwork involved excessive (and the drywall screws tempting).

Getting Started

We determined that the key to building the cabinet right was to reference everything off the doors; the lines of the laminations would establish the shape of the doors and the shape of the doors would dictate the shape of the cabinet. He wanted the doors to overlay the front of the carcass flush to the edges, and he wanted no visible hardware on the outside of the cabinet. After researching all his catalogs, Walter found some European style hinges (Blum #D9614, available from The Woodworkers' Store, 21801 Industrial Boulevard, Rogers, MN 55374-9514) that would work, requiring only a 3/16" gap between the doors. After estimating the weight of the doors, he figured he needed ten pairs (he ended up using nine) and placed his order.

Walter milled his stock and then used his shaper to tongue—and-groove the edges for laminating. Because of the angle of the boards in relation to the final shape of the doors, he was able to use shorter oak boards at the top of the panels, and the cherry didn't need to run the full length either, thus reducing a lot of waste (see Figure 2).

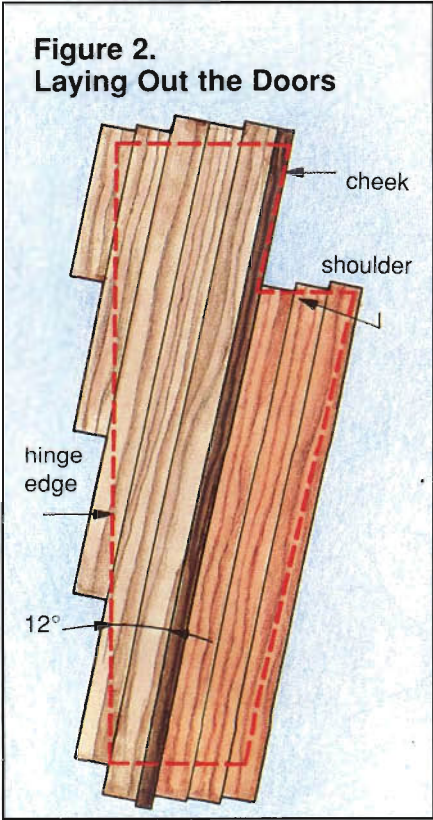
When the panels were dry, he laid out the shape on one of the doors. First he used his eight-foot level as a straightedge to establish the hinge edge at the angle that looked best to him, resulting in a 12° angle between the walnut stripe and the hinge edge, as shown in Figure 2. Then, with a framing square and straightedge, he established the top and bottom square

to the hinge edge. The outside edge would run parallel to the walnut stripe, and he marked another line square to the hinge edge to locate what we came to call the "shoulder" of the cabinet. The line for the "cheeks" followed the outside of the walnut stripe.

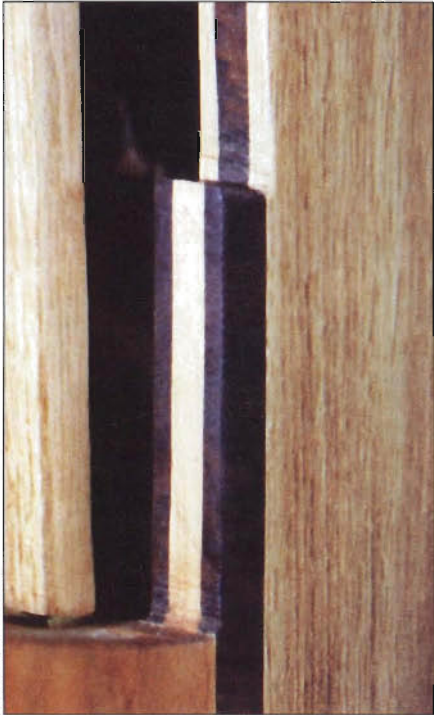
Walter clamped the two panels together face to face, lining up the walnut stripes, so he could cut them out simultaneously with his portable circular saw. After he cut the line for the cheeks as far as he could with the circular saw and finished the cut with a hand saw, he discovered an interesting effect: the tongue of the cherry was showing in the edge of the walnut, making a pretty pink stripe centered in the thickness of the darker wood. He liked the way this looked, and decided to exploit the effect further by leaving just a short length of the walnut and cutting the cheeks back to the edge of the oak so you could see a walnut stripe centered in its thickness. He would make the carcass flush with the cheeks, and just let the little ends of the walnut stick out from the box (I guess you could call them ears).

Next, he glued up the panels for the box itself. His S4S oak was 5" wide; the cherry was approximately 4-3/8" wide, and the walnut was about 1-7/8" wide. After tongue-and-grooving them, he made 15-3/8" wide panels with oak at the front edge followed by a narrow strip of walnut, followed by a wider strip of cherry, followed by another plank of oak.

We figured that the shoulders of the cabinet would have to be one piece running the full width in order to properly support the head, so this piece would just be integrated as a shelf on the inside. The cutting list below shows the rough lengths for these parts; what ultimately determines their lengths is the bottoms of the finger sockets, and that's all based on making the box fit the doors. By leaving the fingers long until after assembly, we figured we'd have "handles" to help us with clamping.



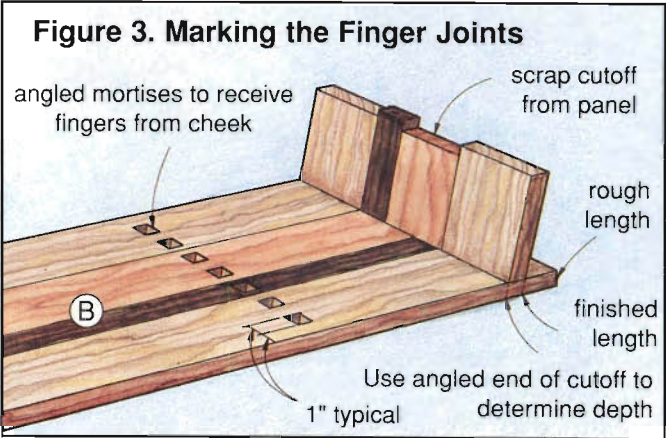
Walter liked the striped effect from revealing the cherry tongue in the walnut groove, so he decided to repeat it by trimming back the walnut to reveal its dark tongue in the edge of the oak.



photos by the author

"Where's Them Drywall Screws?"

To lay out the finger joints, Walter first laid the doors on the floor with 3/16" spacers between them to determine the outside measurements of the carcass. He then decided which surface would be the outside of each panel and marked its length. With a sliding T-bevel set to the angle of the doors (approximately 78°) he transferred this line to each edge, then carried it over to the other side of the panel. After cutting them to rough length, he held one of the offcuts up to the angled edge to mark the thickness of the panels and used a framing square to carry this mark across the wide surfaces, thus establishing the bottoms of the finger sockets (see Figure 3). Next, he marked 1" intervals across each panel, measuring from the front edge and leaving 1-3/8" at the back. He decided that he wanted the horizontal members to pass in front of the vertical members; therefore, the top (A), shoulder (B), and bottom (C) panels would all have a finger at the front edge. The sides (D) and cheeks (E) would have sockets at their front edges, so Walter carefully marked the waste areas, shad-



Upside-Down Linen Cabinet						
Cutting List						
Qty	Part	Finished Size			Piece	
		T	W	L		
1	A	3/4"	15 3/8"	43 3/4"	top	
1	B	3/4"	15 3/8"	60 1/2"	shoulder	
1	C	3/4"	15 3/8"	34 1/4"	bottom	
2	D	3/4"	15 3/8"	64"	sides	
2	E	3/4"	15 3/8"	19"	cheeks	
1	F	3/4"	14 5/8"	62"	long partition	
1	G	3/4"	14 5/8"	19"	short partition	
1	H	3/4"	60 1/2"	81"	back	
Supplies						
10	pair #D9614 Blum European hinges*					
10	pair # D9636 twin application plates**					

*It would also help to have the special drill bit #HSS-M5810.
**These plates are used in conjunction with the hinges to modify them for this application.

ing them heavily with pencil.

We considered a number of different ways to cut the sockets and tried several. One idea was to set up a Portalign® drill guide with a 12° shim attached to the base and drill out the waste with this setup. We gave up on that when we couldn't get the chuck off Walter's drill to attach the drill guide. Another idea was to make a special miter gauge with a 12° ripping attached to a strip that fit in the slot in his band saw table. This worked really well with the shorter pieces, enabling us to cut several kerfs in each socket that would set the bottoms of the sockets at the 78° angle we needed. We would then chisel out the waste until we reached the end of the kerfs. Cutting the larger panels with this method proved to be too awkward, however (see the photo below). I got to be pretty good at holding a Japanese hand saw at the proper angle to cut these kerfs, but ultimately, we decided to just cut them flat



For the smaller pieces, a shop-made miter gauge with a 12° ramp proved to be an effective way to make band saw kerfs that established the bottoms of the sockets; however, this setup was too cumbersome to use for the long pieces.

By marking and chiseling from both surfaces, we were able to cut sockets with sloped bottoms to fit snug against the fingers of the sloping sides.



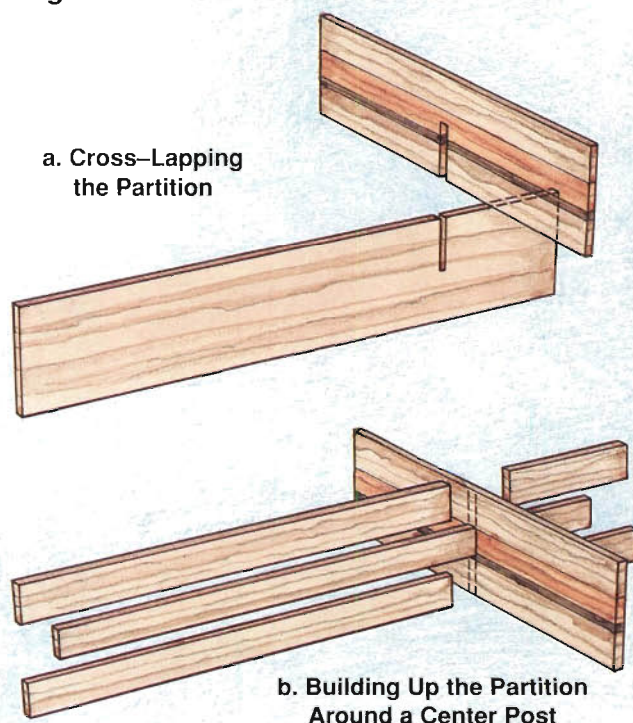
on the band saw, stopping at the short end of the sockets and then cutting back the rest of the way with our chisels.

We fitted together the bottom section first (up to the shoulder panel), trimming the fingers to fit and setting it up on the doors to check. When that fit right, we joined the top and the cheeks. Then we laid out the angled through-mortise locations on the shoulders that would accept the fingers of the cheeks. To cut these, we drilled out the waste well away from the lines using an electric drill and a 78° guide block to eyeball the angle. We then trimmed back to the lines, chiseling from both sides toward the center. By this time, we were both beginning to wonder if there wasn't an easier way to join the sides of this box.

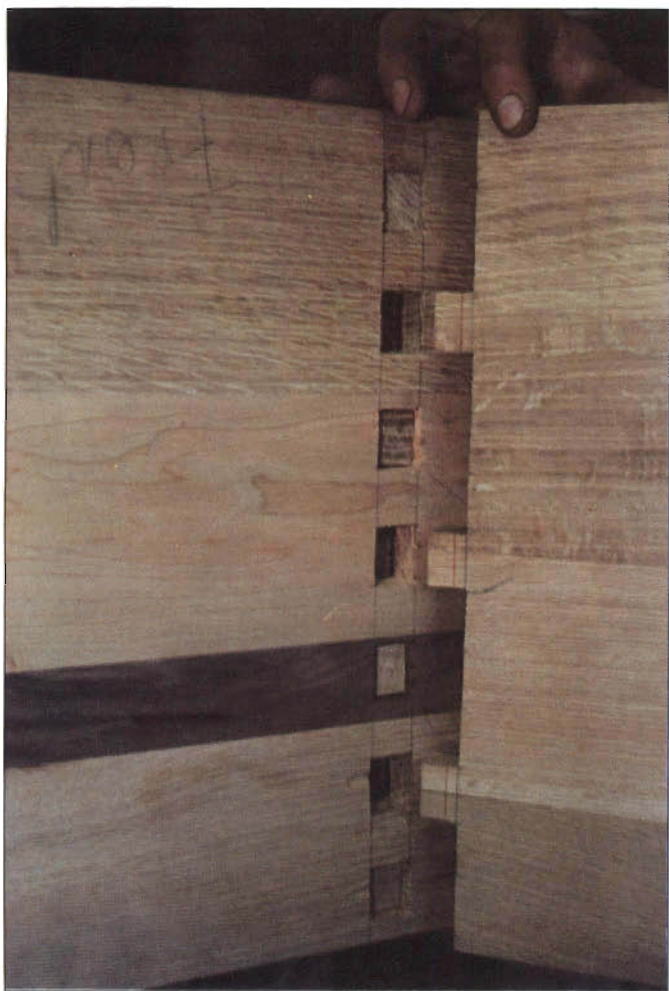
Invisible Fingers

Up to this point, we really hadn't thought too much about how to incorporate the partition. I thought we could just cut halfway into the shoulder from the back and halfway into the partition from the front and cross-lap the pieces like the cardboard dividers in wine cases (see Figure 4a), but Walter felt that would weaken the shoulder piece too much for it to support the head assembly. He was considering inletting a 2" wide piece that ran the full length of the cabinet and then gluing panels to it above and below as shown in Figure 4b. That was when I hit on an idea that might solve the problem in a manner true to the construction we had used so far (and, of course, subject our tired arms to still more chisel work). We agreed to make a long partition (F) for the lower portion of the cabinet and a short partition (G) for inside the head, and we would join these pieces to the case at either end with more 1" finger joints (though in this application they could more accurately be referred to as stub tenons). Fingers would go through the top and through the bottom, and where the two partitions meet at the shoulder panel, we would eliminate alternating fingers so that both pieces could enter the shoulder without interfering with one another (see the photo above right). We

Figure 4. Two Discarded Ideas



Illustrations by Tom Larson and Ginny Pruitt



Alternating fingers were removed from the two partition pieces so they could both fit into the shoulder piece at the same point.

felt a sort of "craftsman's pride" that we would subject ourselves to all this extra work which, when the cabinet was assembled, would be forever unseen.

We glued up panels for these two partitions that were the depth of the cabinet, minus the thickness of the back, and cut them to length based on measurements taken from the dry-assembled carcass. They needed to be at least 1-3/8" longer than the inside measurements to allow for 5/8" fingers to enter the shoulder panel and at least 3/4" fingers to go through the top (A) and bottom (C).

Laying out these joints was just a matter of locating the exact centers of the three horizontal panels and then centering a row of 3/4" X 1" mortises along these lines, measuring from the front edges just as we had when laying out the rest of the joints. To keep the horizontal lines uninterrupted, we again started the actual mortises at the 1" mark that was second from the front edge. After two days of cutting angled finger sockets and mortises, cutting these straight ones was a breeze.

How About a Back?

Like any self-respecting, purist fine furnituremaker, Walter shuns the idea of using plywood in his pieces (especially when he's gone to such lengths to avoid using drywall screws). He wanted to make the back of this cabinet from solid, quartersawn white oak. Of course, this raises the problem of seasonal expansion and contraction. Wood shrinks and swells the most across the grain, and he was proposing a panel that was nearly 60" in

width. The traditional design solution would be a frame and panel back. The frame would be stable and the panel inside the frame would be allowed to "float" unsecured, free to change size at the whims of the barometer, while remaining contained within the frame. Neither one of us was sure if a panel that size could be contained within a frame, and we knew that construction of such an assembly would be far more difficult than the already foolishly difficult procedures we had tackled thus far. We had to approach this problem from a different perspective. It was Walter who came up with the idea we used, and as of this writing, it seems to be working.

He put together a panel (H) of 3/4" oak sized to the dimensions you see in the Cutting List. We laid it on the floor and dry-assembled the cabinet on top of it, trying the first of several clamping arrangements. We got all the joints snug and set the doors in place with their 3/16" spacers between them and trued the cabinet to the doors. We then traced around the box to transfer the shape to the back panel. After disassembling the box, we drew a new outline 3/8" inside the previous outline and cut out this shape with a portable circular saw.

Next, we cut a 3/8" X 3/4" rabbet along the back edges of the carcass pieces, stopping these cuts 3/8" from the finished end points. (Walter did this with a 3/4" dado setup on the table saw, squaring the ends of the cuts later with a chisel.) A portion of the shoulder panel between the cheeks had to be cut out entirely, as shown in Figure 5.

Now we tried another method of clamping this strangely shaped carcass together, trying to find the best method to use during glue-up. We laid a full sheet of 3/4" plywood on some sawhorses and set the doors down on this with their spacers in

With the carcass dry-assembled on top of the back panel, we traced the shape. Though not shown here, we placed the doors in position to guide us in truing up the carcass.



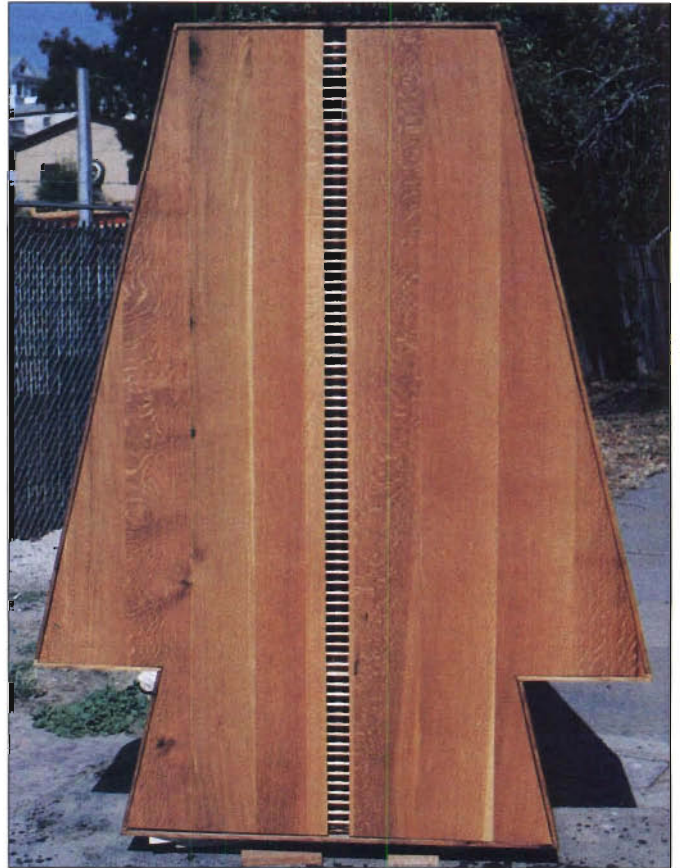
photos by the author



To clamp the case so it would align with the doors, we first positioned the doors on some plywood and secured cleats all around. We used bar clamps where possible and ropes tightened like a tourniquet to pull the sides together. Then we dropped the back in place and set some more bar clamps across the assembly.



Drywall screws with washers driven into 2 X 4 spacers (shown here being removed after glue-up) helped draw the "head" tight.



To allow for expansion and contraction of the back, we cut a 2" section from its center, fixed dowels in one end, and let them "float" in oversize holes in the other half.

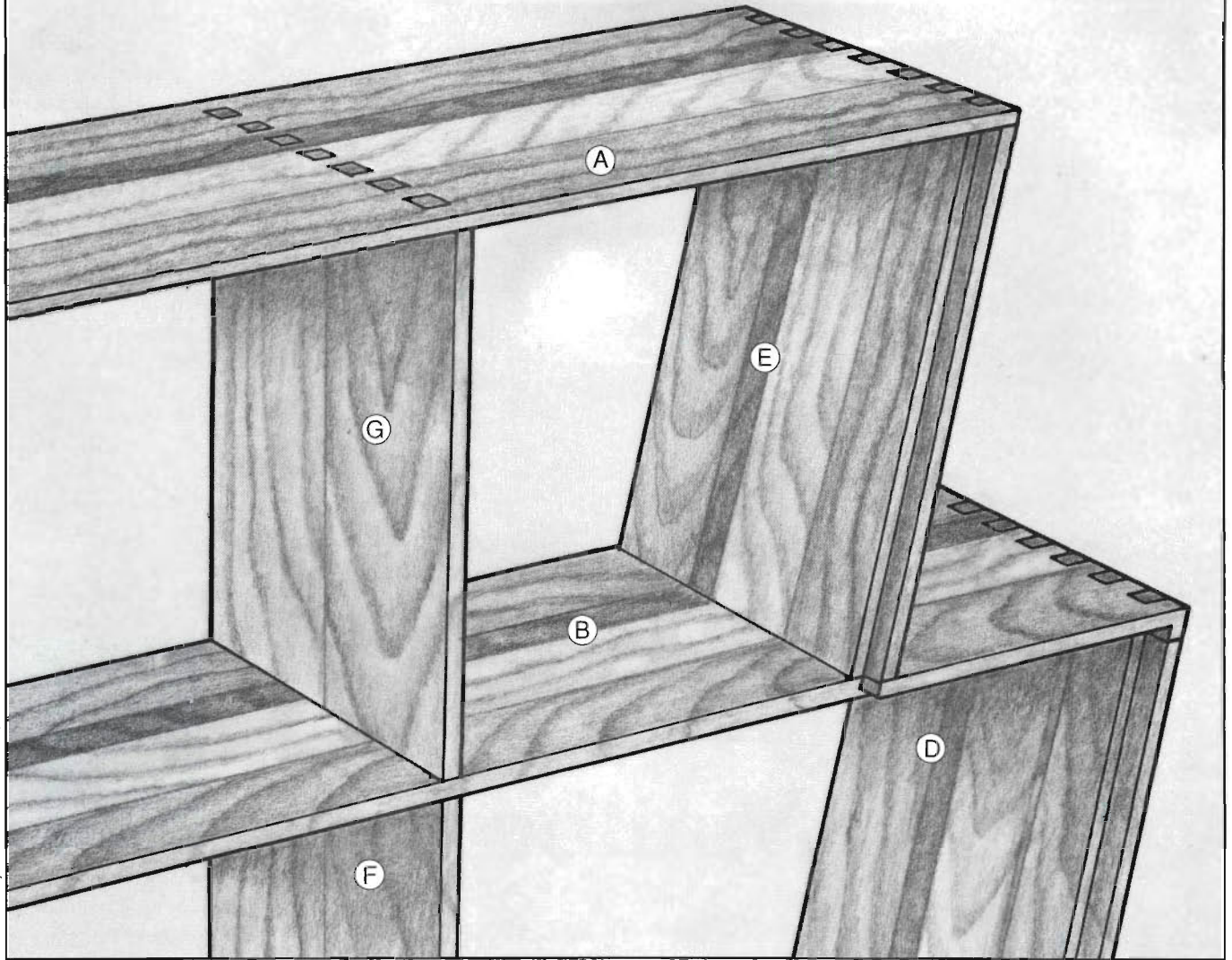
After attaching the doors, Walter felt the cabinet worked better flipped end for end, rather than the way he'd originally designed it.



photos by the author



Figure 5. The Back Rabbet



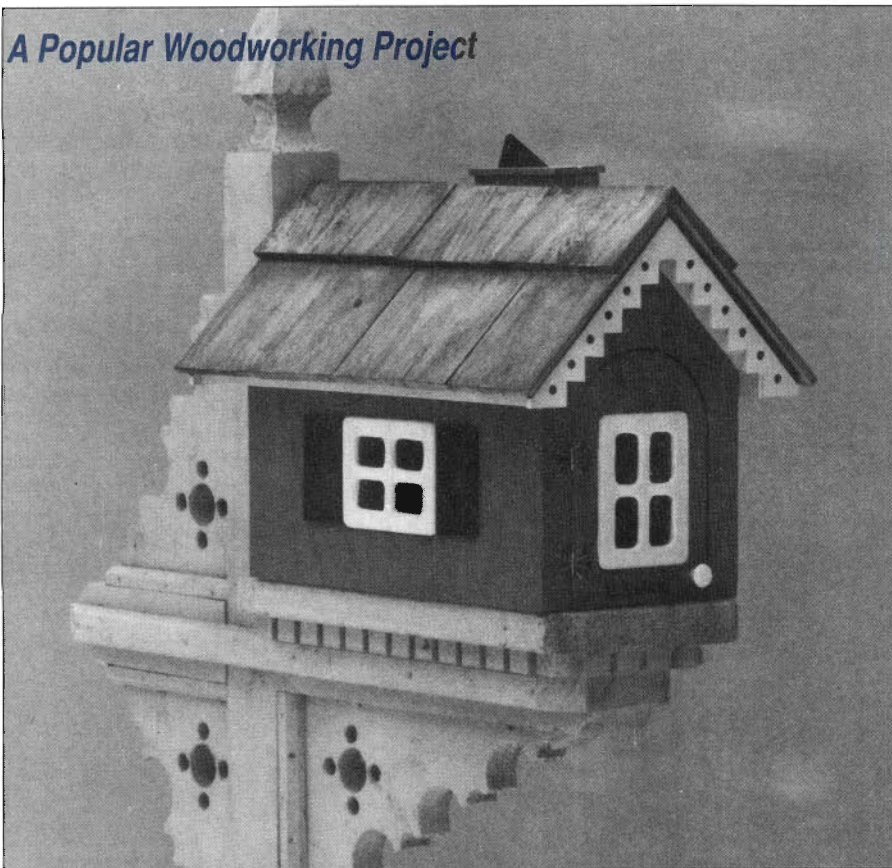
illustrations by Tom Larson and Ginny Pruitt

place. Next we surrounded them with 2 X 4 scraps which we screwed to the plywood snugly against the edges of the doors (see the upper left photo on page 66). These 2 X 4 pieces would "capture" the carcass sides and hold them in line with the doors at the front of the box. Then we assembled the sides and wrapped them with rope to help draw them together. Long bar clamps run along the sides and set on the extended fingers of the shoulder and the bottom panels helped pull it tight in that direction. We cut lengths of 2 X 4 to fit inside the head and made holes in the shoulder and top to drive drywall screws (of all things) through the two panels so they could be pulled snug. There was no way to run bar clamps the length of the cabinet because we had to be able to drop the back panel in to true up the box.

This dry-assembly seemed to work pretty smoothly and went fairly fast. Now we were able to check the fit of the back panel in its rabbet and trim it where necessary. "But, what about expansion and contraction?" you ask. Here's what we did: after fitting the back, we ripped a 2" section right out of the middle of it. We then marked the two pieces for dowels at 1" intervals (I would have done wider spacing). On one side we used a doweling jig to drill 5/16" holes 3/4" deep. On the other side we drilled 3/8" holes 3" deep. We glued 5/16" X 3-1/4" long dowels into the half of the back with the tight, shallow holes and let them "float" in the other

half. By gluing and screwing the outside edges of the back in only the side rabbets in the lower portion of the box and using screws in slotted holes around the rest of the back, we figure we've accommodated the wood's tendency to move. This cabinet spent the rest of the winter next to the dry heat of Walter's woodburning stove; and in the spring he did some steam-bending in the same room, so it's had a pretty good test.

Well, the glue-up went well, and the next day we unclamped this monstrosity and sawed off the extra length on the fingers. After extensive scraping and sanding, Walter hung the doors and oiled it. It was about this time when he realized he'd designed and built the cabinet upside-down. Because of the shallow depth and the weight of the doors, the cabinet was top heavy, and when you opened the doors, it tended to want to fall over. Flip-flop the box, and the problem is eliminated; so it didn't take long for us to agree that his art deco linen cabinet looked just fine upside-down. If he'd made the sides 18" or 20" wide, it would probably work fine the other way. (He could also have put a closet pole in it to hang clothing from, if he'd had that extra depth.) He was happy with it though; with shelves inside, and a short base at the "bottom," it would serve the purpose he'd designed it for. All in all, it's an elegant piece. And in spite of the hard work, it was a lot of fun to build. **PW**



Country Mailbox

By Phil Keller

Here's an unusual mailbox to dress up your driveway entrance. It looks great on any post you make or purchase, but especially on the Victorian mailbox post described in our last issue (*Popular Woodworking* #55, July 1990). The country mailbox is easy to build and gives you the chance to show off your woodworking skills to all who pass by. It's sturdy, made of weather-resistant materials including wood shingles, and will withstand a lot of abuse. Other features include a side-hinged door with a magnetic catch to keep it closed, three windows that let you check the contents without opening the door, a chimney flag to signal mail pickup, and a removable bottom that simplifies attachment to the post.

Shaping the Parts

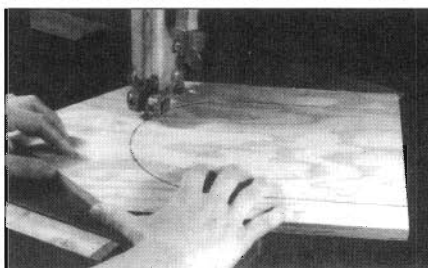
You will need a 35" X 40" piece of 1/2" A/C plywood, a 15" X 16" piece of 1/4" plywood, and a 6' length of 1 X 6 pine,

Phil Keller works wood and gets mail in Pompton Plains, New Jersey.

which should be put aside for now. From the 1/2" plywood cut the front and back (A), two sides (B), the bottom (C), and the roof panels (D and E) to size according to the Cutting List on page 60. Then cut the three window frame blanks (F), four bargeboard trim pieces (G), and four shutters (H) from the 1/4" plywood. Fill any defects in the plywood with wood filler.

Use a sabre saw or band saw to cut the door opening in the front. Saw carefully and save the cutout to use as the door. Lay out the window and knob locations as shown in Figure 2. Drill 1/2" holes in the four corners of the window, and saw

Use the front panel cutout to make the door.



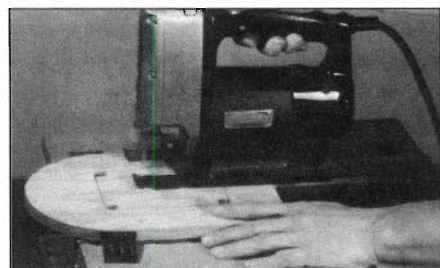
out the window opening. Then drill the hole for the knob. Cut out the window openings on the sides, too, and drill three countersunk holes in each side panel for the base mounting screws (Figure 2). Also drill countersunk holes for two screws in the underside of the right roof panel so you can mount the chimney later.

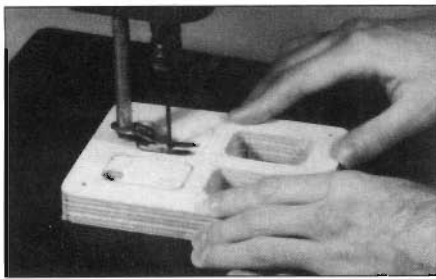
Complete the cutting of the window frames (F). Since they're identical, saw the three together. Stack the blanks with the pattern you'll find in the PullOut™ Plans in the center of the magazine, and fasten the stack with 3/4" brads located out of the cutting areas. Drill a hole in each window pane for the saw blade, and saw out the panes. Round their corners as shown on the pattern. Then remove the brads and put the pieces aside.

The four bargeboard trim blanks (G) can also be stacked and cut together. Lay out the pattern from the PullOut™ Plans on one of the blanks, then stack and fasten them together with two 1" brads, located out of the cutting area. Bandsaw the profile to shape. A miter gauge set at 45° will come in handy here, if your band saw table can accommodate it. Complete the trim pieces by drilling holes for the screws that attach them to the front and back. Sand the edges smooth.

Prepare the window shutters (H) by scoring two lines 3/4" in from each side with a marking gauge to give the illusion of three-piece construction. Sand their edges smooth.

Now cut the rest of the pieces from 1 X 6 pine. Saw a 22" length for the side cornices (I), an 8-1/2" length for the end cornices (J), a 19-1/2" length for the cleats (K, L and M), and three 5" lengths for the chimney (N). Begin the side cornices by ripping the 22" length to yield two pieces, each 2-11/16" wide. Glue them together to produce a 1-1/2" thick stock—since the mailbox will meet the elements everyday, use a waterproof plastic resin glue. Take the three 5" lengths and glue them up to form 2-1/4" stock for the chimney (Figure 2). *Cut between the holes to make the windows.*





illustrations by Tom Larson

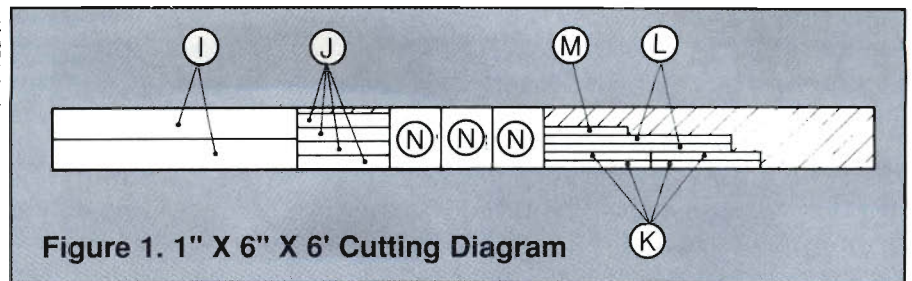
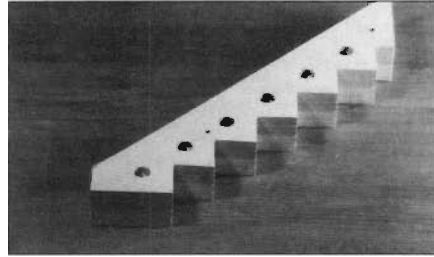


Figure 1. 1" X 6" X 6' Cutting Diagram

Stack and cut openings in the three windows.

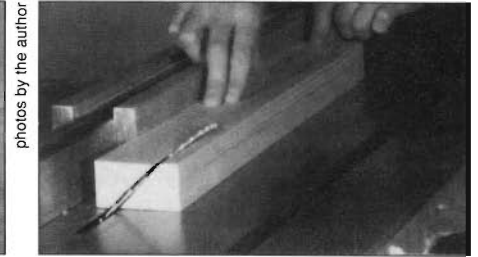
3). When the glue is dry, square up the stock and set the saw blade for a 2" deep cut; then rip a 1/8" wide kerf for the flag.

When the glue is dry on the 22" stock, square it up and trim it to the exact length of the side cornices. Set the table saw blade to 45° and rip the stock to produce the two side cornice pieces (Figure 3). Then cut a 45° bevel across the end of the chimney to achieve its finished 4-1/2" length. While the blade is still angled, cut a 45° bevel across both ends of the 8-1/8" length of pine; then reset the blade to 90°



Cut four bargeboard trim parts together.

and rip the four end cornices from it. Next, set the table saw fence to 3/4" and rip five lengths from the 19-1/2" piece. Cut these lengths to yield the four side cleats (K), two



photos by the author

Ripping at 45° produces two side cornices.

bottom cleats (L), and the rear cleat (M) as shown in Figure 1.

Now set up your router with a 1/8" corner rounding bit and round the edges of

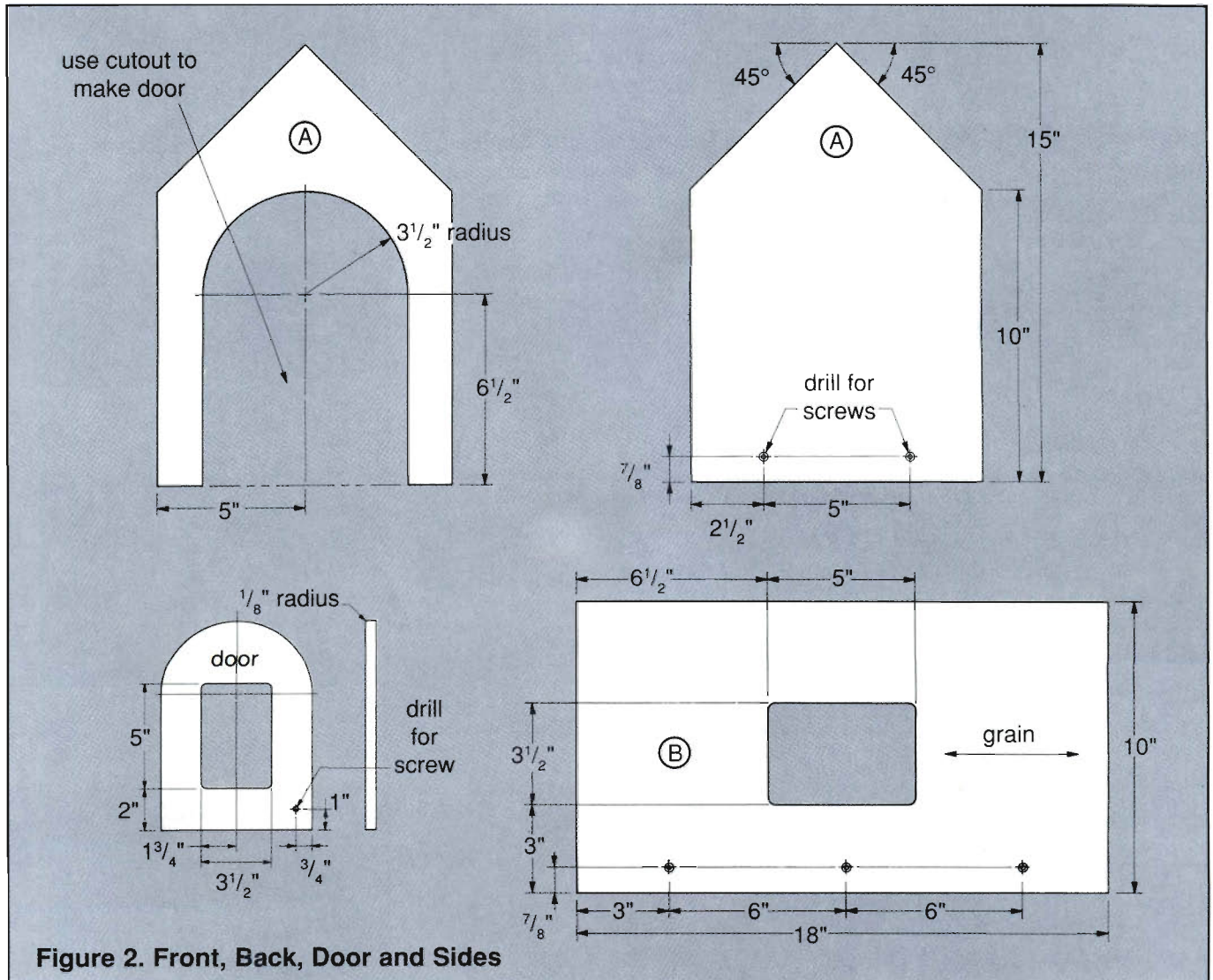
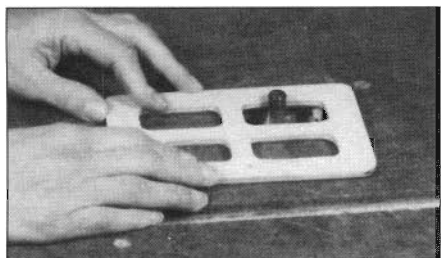


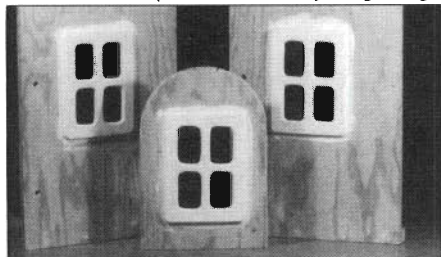
Figure 2. Front, Back, Door and Sides

the chimney. Also round the outside edges of the window frames and door. Sand all edges smooth. Drill two holes for the flag mounting screws.

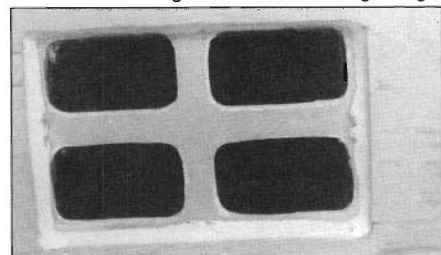
The window panes require 1/8" thick clear acrylic plastic, which often comes with a paper covering that protects it from scratches during fabrication. If your material doesn't have it, apply masking tape to the plastic surfaces for protection while you work. The tape also provides a surface for laying out the three window profiles. Use a fine tooth saw blade to cut the



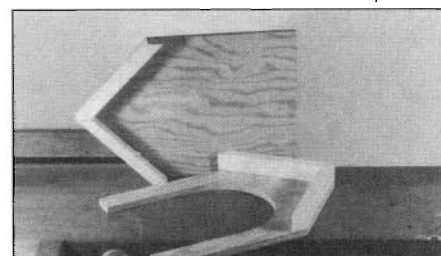
The frames are primed and ready for glazing.



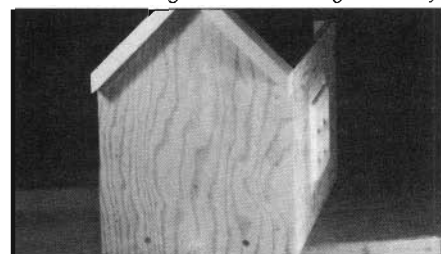
A bead of caulking seals the window glazing.



Glue the cornices to the front and rear panels.



Be careful not to glue bottom during assembly.



plastic to size. The panes should fit loosely in the door and side panel openings.

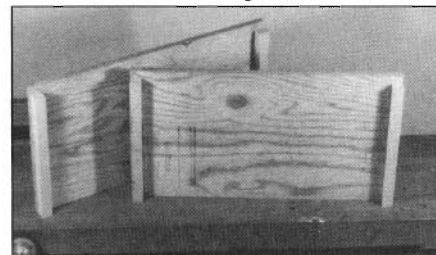
You can make the mailbox flag from a replacement flag kit available at home centers. It will require some modification as shown on the full-size pattern in the PullOut™ Plans. Or you can make a flag from plywood, double-tempered masonite or plastic. (If you make your flag, chances are you'll need to cut a wider kerf in the chimney than discussed above.)

Framing Your House

You're ready for assembly. Begin with the windows. On the outside surface of the door and sides, mark a line around the window openings 1/2" from the edge (see the detail in Figure 4). Then glue and nail the window frames over the openings, keeping them within the 1/2" lines. Prime the frame and cutout openings. After the primer dries, spread a small bead of silicone sealant around the inside edge of the frames. Remove the protective paper or tape from the plastic window surfaces and insert a pane into each opening, embedding the plastic in the sealant. If any of the sealant smears on the windows, clean it up. Press four glazing points behind each pane to hold them in place and apply a bead of sealant around the inside edges.

Before assembling the box, attach the

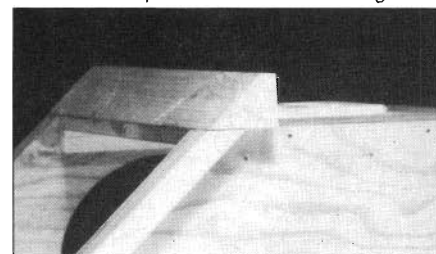
Attach cleats inside with glue and nails.



Picture frame clamps hold sides and bottom.

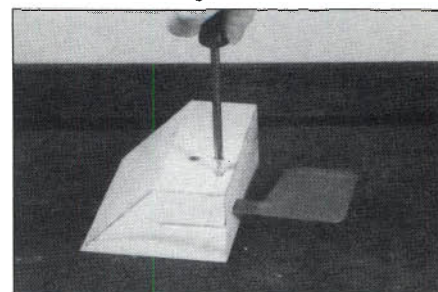


Side cornices provide area for attaching roof.



Country Mailbox					
Cutting List					
Qty	Part	Finished Size			Piece
		T	W	L	
2	A	1/2"	10"	15"	front/back
2	B	1/2"	10"	18"	sides
1	C	1/2"	9"	18"	bottom
1	D	1/2"	10"	21 1/2"	left roof
1	E	1/2"	9 1/2"	21 1/2"	right roof
3	F	1/4"	4 1/2"	6"	window frames
4	G	1/4"	17 7/8"	10 1/4"	bargeboard trim
4	H	1/4"	4 1/2"	4 7/8"	shutters
2	I	*1 1/2"	2 11/16"	21 1/2"	side cornices
4	J	3/4"	1 1/4"	8 1/8"	end cornices
4	K	3/4"	3/4"	9 1/2"	side cleats
2	L	3/4"	3/4"	16 1/2"	bottom cleats
1	M	3/4"	3/4"	7 1/2"	rear cleat
1	N	*2 1/4"	4 1/2"	5 1/2"	chimney
*glued up from 3/4" stock					
	Supplies				
2	#8 X 2" flat head wood screws				
10	#6 X 1 1/4" flat head wood screws				
12	glazing points				
1	1" diameter ceramic knob				
1	magnetic catch				
2	decorative hinges				
1/8" clear acrylic plastic for window panes					
mailbox flag					
3 1/4 square feet of wood shingles					
plastic resin glue					
silicone sealant					
primer & paint					

Screws hold the flag and limit its travel.



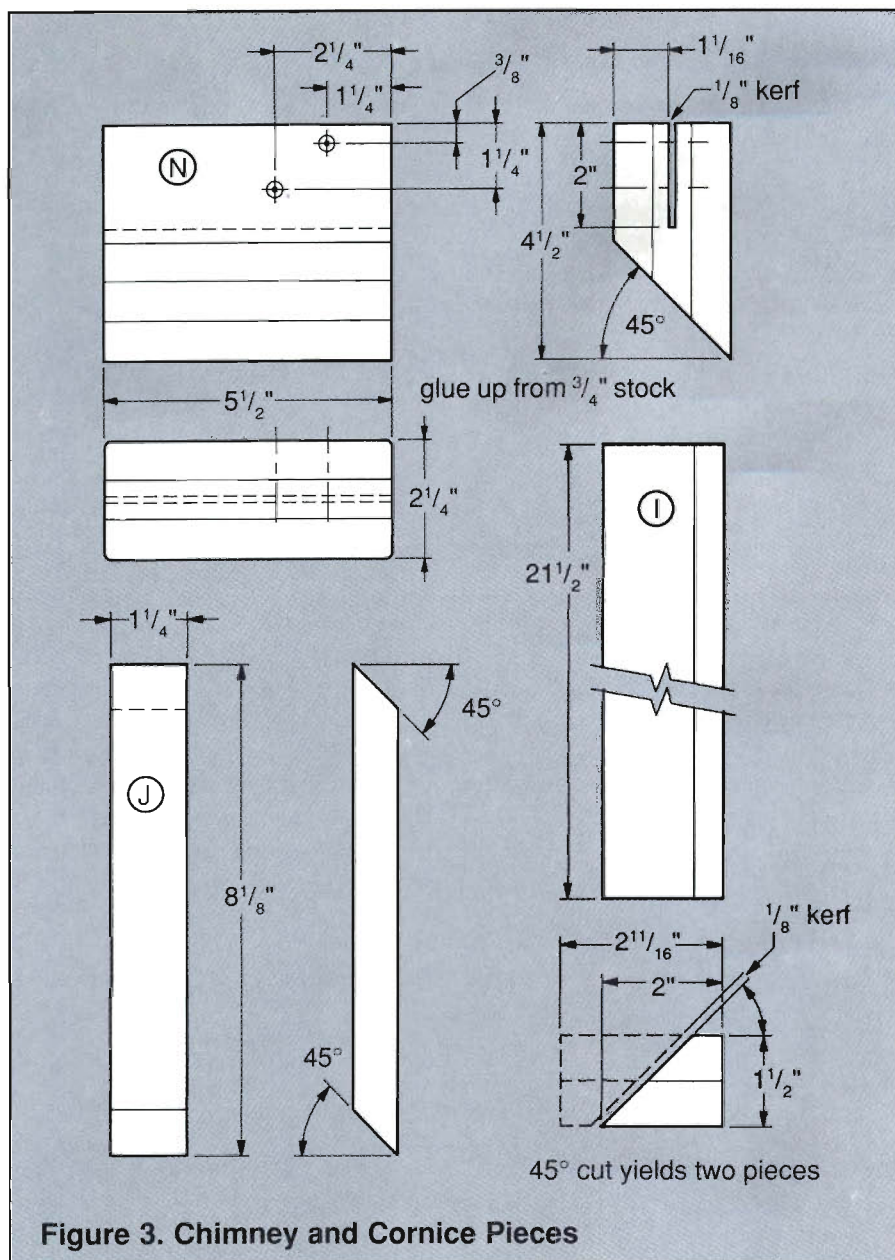
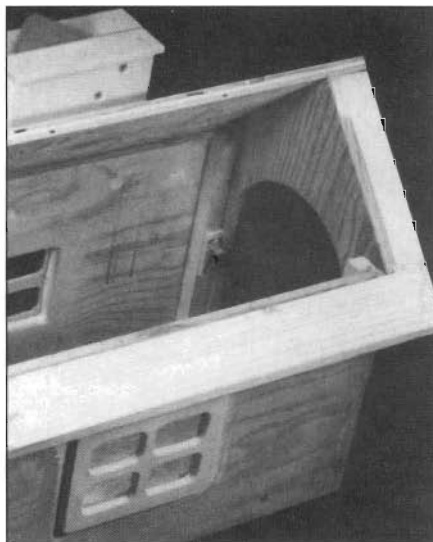


Figure 3. Chimney and Cornice Pieces

The front is glued and nailed to the side panels.

Attaching the left roof will complete assembly.



cleats and cornice pieces to the sides and bottom as shown in Figure 4. With waterproof glue and wire brads, secure two side cleats (K) to the inner surface of each side. Glue and nail the bottom and rear cleats (L and M) to the bottom. Position the bottom cleats so they won't interfere with the side cleats when you join the sides and bottom. Glue and nail two end cornices (J) to the outside surfaces of the front and back.

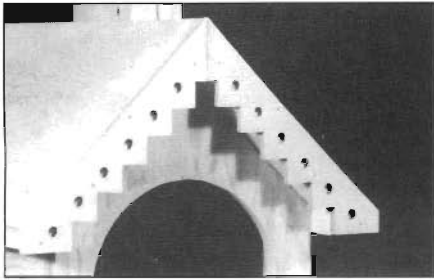
To assemble the box, join the sides to the bottom with screws; then glue and nail the back to the sides. Use two screws to secure the back to the bottom, but don't use glue because the bottom must be removeable. Glue and nail the front and the two side cornice pieces (I) to the sides.

Begin the roof assembly by attaching the flag to the chimney with the pivot screw; then drive in a second screw in order to limit flag travel. Locate the chimney position on the right roof panel and attach it with two screws. Now glue and nail the right roof panel to the box assembly, and then attach the left roof panel. Apply the bargeboard trim (G) to the front and rear cornices with nails and glue. Locate the shutters (H) adjacent to the side windows as shown in Figure 4, and glue and nail them in place, too. Finally, countersink all nail heads and fill with wood filler; sand edges and surfaces smooth in preparation for finishing.

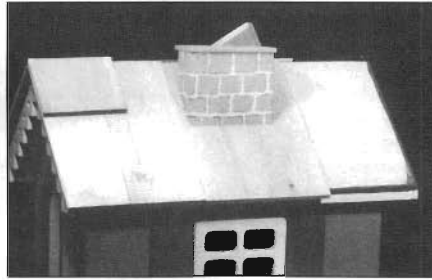
Exterior Decorating

Now it's time to create your own painted lady. Select bright or subdued colors, or match the color scheme of your house. Use exterior grade paints—a flat finish for the body of the mailbox, and semigloss or gloss for the trim. All surfaces should first be sealed. Remove the bottom panel so you can paint the interior and remove the chimney. Apply a coat of primer all over, and finish with one or more finish coats. Paint the trim carefully; the project's final appearance depends greatly on it, and most people will judge your work by the care you take here.

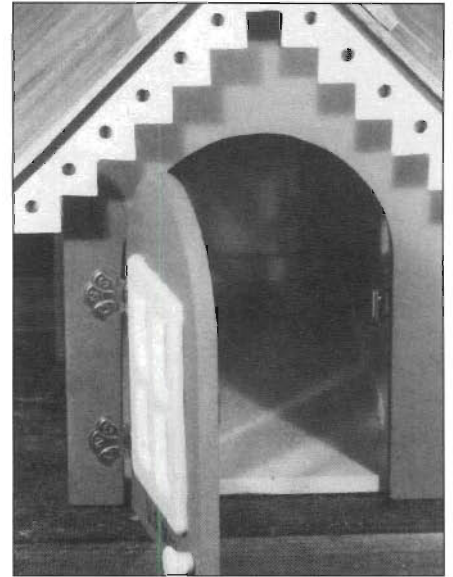
Apply the roof shingles after the finish is dry. You'll have to cut them to size. Begin by splitting any shingles wider than 8" in half. Cut the first course shingles to a 10-3/8" length and the second course shingles to a 4-3/8" length. Make all cuts from the end opposite the butt (thick) end. Use two shingle nails per shingle to fasten them to the roof panels. Locate the nails about 1" from the edge and above the butt. For the second course shingles, use two



Decorative bargeboard trim hides the roof panel end grain.



Installing the chimney over the first course of shingles reduces cutting.



You'll need hinges, a door knob and a magnetic catch for the door assembly.

additional nails located 1" down from the ridge. After applying the first course, drill through the shingles and reinstall the chimney. Stagger the joints between the shingles over adjacent courses. Trim the second course shingles to fit around the chimney. You can finish the roof, or leave it unfinished to weather naturally. The roof pictured was finished with a coat of gray latex stain, with a black glaze wiped over it to give a weathered look.

Complete assembly by installing the door hardware. The hinges, door knob, and magnetic catch should all be available at your local hardware store or home

center. For the door, buy two small decorative hinges made from a noncorrosive metal such as brass, and designed for surface application. A small magnetic catch is sufficient to keep the door closed. Attach the magnet to the side panel cleat and the striker plate to the door. Fasten the knob to the door with a machine screw, and apply a drop of thread sealant to prevent the screw from loosening.

Mounting the mailbox on the post is easy. Simply remove the screws holding the bottom panel and separate it from the box. Then securely attach the panel to the post with appropriate fasteners. Now

re-attach the box to the bottom panel. That's it! Your box is ready to house junk mail, bills and, of course, the latest issue of *Popular Woodworking*. Sit back and enjoy years of faithful service from this unique and durable country mailbox. **DW**

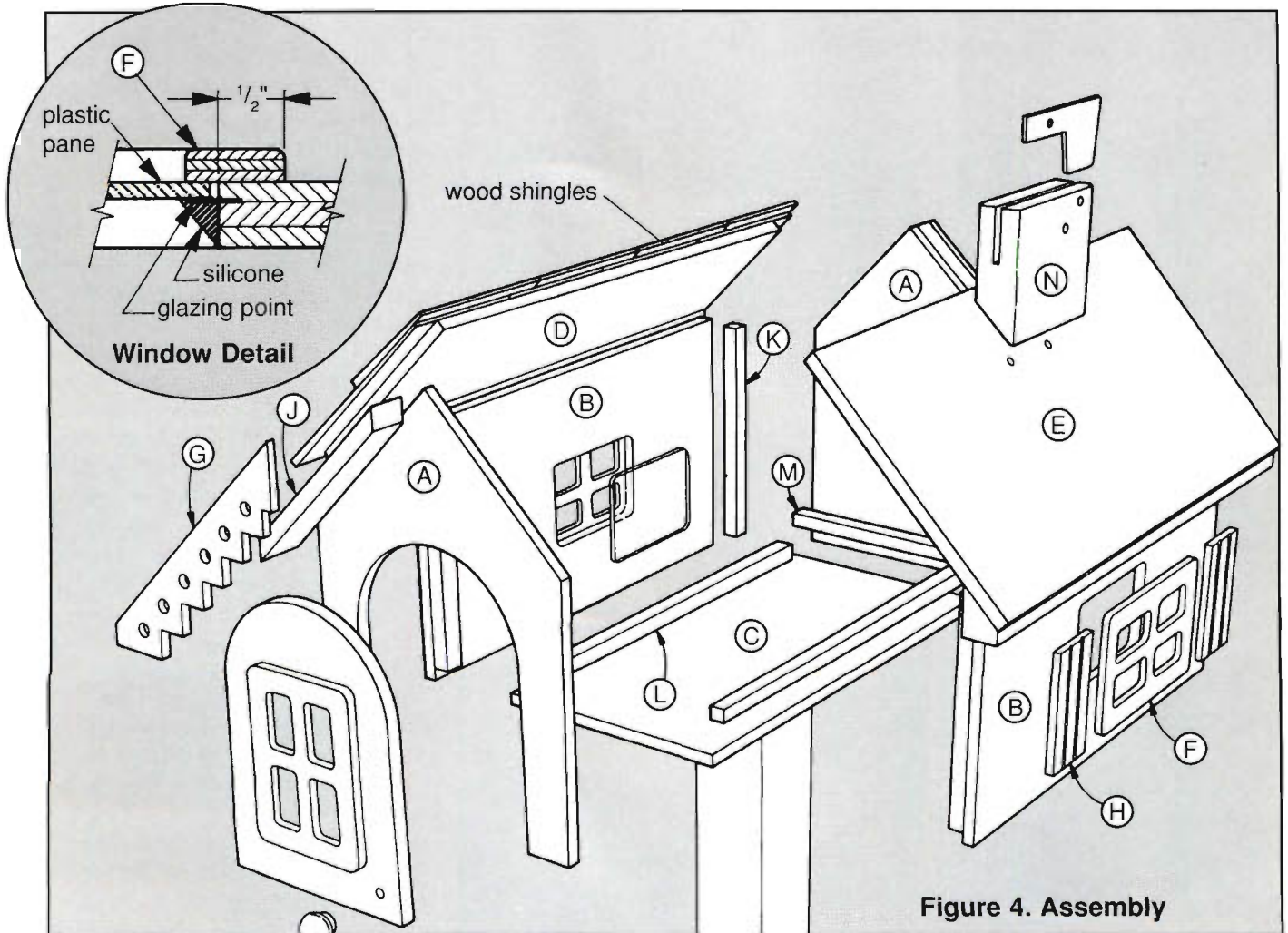


Figure 4. Assembly

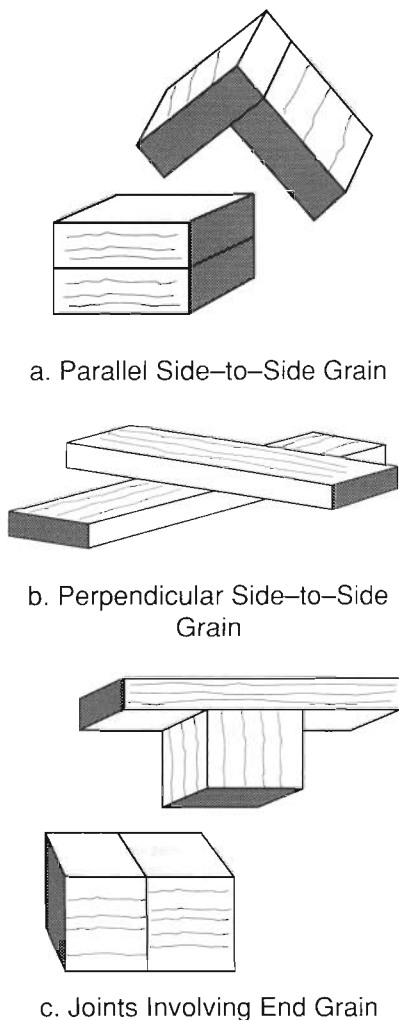
Laminating Woodcarving Blocks

by William H. McMaster

Because of the difficulty and expense of obtaining large carving blocks, you may have to laminate several pieces of wood to obtain the size you want. You'll also want to laminate so you can carve with the grain for strength, or to eliminate end grain where you want to carve details. To properly prepare a laminated carving block you must consider the wood's characteristics,

William H. McMaster is Chief of the Education Division of the California Carvers' Guild. His "Focus on Carving" is a regular feature in Popular Woodworking.

Figure 1. Matching Wood Grain in Glue Joints



the qualities of the mating surfaces and of the glue, and the gluing process. In this article I'll discuss how these factors affect the woodcarver.

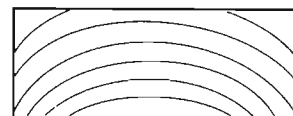
Wood Characteristics

It's always true that you must plan your carving around the characteristics of the wood, but this is especially true in laminating a carving block. The grain direction of the joined parts, the grain pattern and color variations, dimensional changes due to moisture variations, the porosity of the wood, and the presence of natural oils and resins are all important factors in the laminating process.

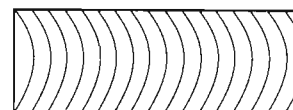
The best glue joints can be obtained when the two pieces are matched with parallel side grain as shown in Figure 1a. For figures with outstretched arms you might want to join the pieces as shown in Figure 1b, where the side grains are perpendicular. The weakest joints—gluing to the end grain—are illustrated in Figure 1c. They must be strengthened with dowels.

When planning the joint, match the grain patterns to the plan of the carving as best you can. Generally wood from a lumberyard or mill will be either plain or quarter sawn (Figure 2). Quarter sawn lumber poses little problem in matching the grain, but there are several ways of matching grain with plain sawn lumber. You must take into account how the wood changes dimension during moisture exchanges. As shown in Figure 3, plain sawn boards tend to warp away from the heartwood. These warping forces are indicated by the arrows in Figure 4 for three different ways of matching two blocks. Of the two stronger methods, which one you choose will be influenced by how the grain pattern affects the look of the finished carving. The symmetric joint shows off the grain pattern the best for many carvings, but I wouldn't recommend it for a portrait carving since the curved grain will detract from the carved features of the face. Figure 5 shows the right and wrong ways of orienting the face on the block of wood laminated with the parallel joint. You should

illustrations by the author



plain sawn



quarter sawn

Figure 2. Grain Patterns in Typically Sawn Lumber

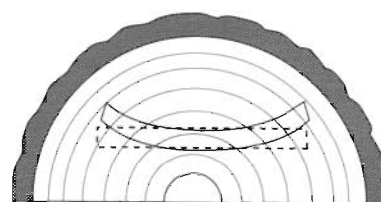


Figure 3. Warping of A Plain Sawn Board

never orient the block in such a way that the glue joint bisects the face. While the strength of the bond itself is not especially important in carving—except for projects that have delicate parts which depend on strength—a good glue joint is required to resist these warping forces.

Figure 6 shows two ways of gluing boards together to form a panel for relief carving. Matching the growth rings usually gives the best surface grain for carving. However, the panel has a tendency to warp into one long curve. This can be subdued by supports mounted on the back of the panel, but wood showing an especially strong tendency to warp should be joined with its growth rings alternately reversed. When the wood warps, this type of panel will produce a wavy surface. Choose the method that best suits the properties of the wood and the type of relief carving you're planning.

Always dry fit your boards before surfacing and gluing. Once you've determined their exact placement, mark two sides of a triangle across them so you can always butt them together correctly during the gluing process.

The wood's porosity and its oil and resin content affect how well the glue penetrates the wood. Porosity is mostly a matter of density, and the more dense woods can be more difficult to glue. Woods strong in resin and natural oils like cocobolo, ebony, rosewood and teak will require extra care to obtain a good glue joint. The gluing surfaces must be cleaned and the oils removed with a solvent such as lacquer thinner or acetone so the glue can penetrate.

Surface Quality

A smooth and clean wood surface is most important in obtaining a good bond. The best practice is to use a hand plane or a jointer for smoothing. Otherwise, you must resort to a fine sandpaper placed on a flat surface. Small imperfections on the two surfaces can be removed by using a double-surfaced sandpaper made by gluing two sheets together. Lightly rubbing the two pieces of wood together with the sandpaper in between will remove small misfits. Be sure to vacuum the sur-

face afterwards. Sanding will, however, leave loose fibers of wood and result in a weaker glue joint. Smoothing is best done with a blade—the sharper the better. A dull jointer will burnish the wood and cause swelling when you apply the glue.

Glues and Gluing

Glues can be classified according to how the bond is formed—by a loss of solvent or by a chemical reaction. In the former type, the diffusion and evaporation of solvent molecules brings the adhesive molecules closer together, allowing them to coagulate and attach to each other. In the latter type, a chemical reaction creates a rigid structure of more complex molecules.

Glues that bond through loss of solvent include the most commonly known and used by woodworkers. White glues (polyvinyl acetate, PVA) are generally of low viscosity and have a long shelf life. They are non-staining and dry clear with a slightly flexible glue line, and they will not dull your tools when you're carving through the joint. They have the advantages of relatively rapid setting time, a fair gap-filling quality, and they're non-toxic. Their disadvantages include low resistance to moisture, the tendency to gum up sandpaper, and creeping under stress

during the clamping process. The most well-known of the white glues is Elmer's, which I use and is popular with carvers, and there's Weldbond which does not have as many solids and is more dilute.

The yellow glues are modified white glues providing improved heat resistance (helpful in sanding) and more viscosity, which increases with age. They contain polymers which improve moisture and creep resistance, they form a stronger joint than the white glues, and give less trouble clogging abrasive paper. They dry with a slightly honey tone, however, which can be visible on the lighter woods, and they're not the best for use on exterior projects or for oily woods. The yellow glues also tend to have a shorter shelf life than the white glues. Examples include Franklin's Titebond and Elmer's Carpenter's Wood Glue.

The glues which bond through chemical reaction are of several types. The urea-formaldehyde or plastic resin glues, such as Weldwood, Wilhold and Aerolite, are water resistant, and good on woods with a high moisture content. They are not good on oily woods such as rosewood or teak where the bonding is inhibited. The glue lines are inconspicuous, but the plastic resin glues are generally poor gap fillers (though they can be modified with fillers if you want to fill cracks in your carving). They have the disadvantage of emitting formaldehyde gas while curing. Resorcinol-formaldehyde glues are both water and heat resistant and are good for exterior projects, but achieving the best bond can be difficult and requires following instructions closely. Furthermore, they leave a highly visible, dark reddish glue line.

Contact cements such as Pliobond are thermoplastics which are applied by double spreading and allowed to dry until no longer tacky. When the two pieces are touched together the bonding begins immediately. This gives you a short assembly time and is suitable where clamping pressure is difficult to apply. This type of glue is used mostly for veneers and the bonding of dissimilar materials such as wood to metal. They're not recommended for general wood-to-wood bonding since they never harden but remain flexible.

Epoxy glues involve two liquids, a resin and a hardener, which are mixed together in equal amounts before application. The glue dries clear. They are excellent for

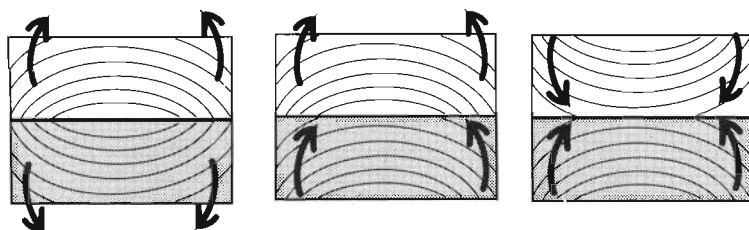


Figure 4. Warping Stresses in Laminated Blocks

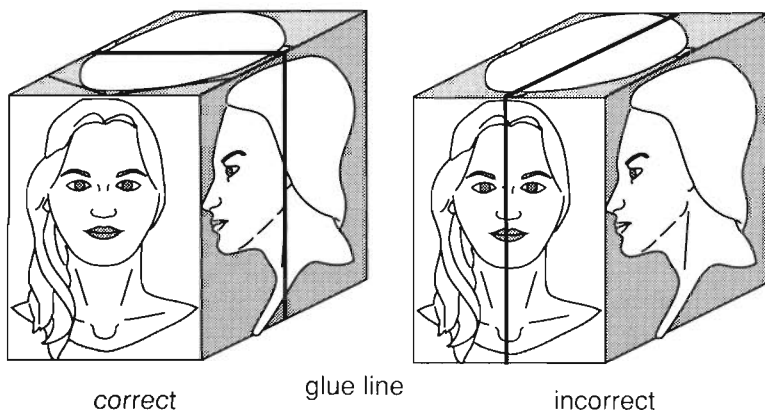


Figure 5. Orienting the Carving in the Block

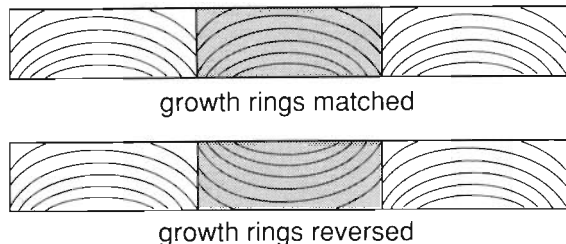


Figure 6. Gluing Relief Panels

making repairs because of their strength and very short curing times. They work well on oily woods such as cocobolo, rosewood and teak.

The process of gluing involves the three steps of surface preparation, glue application, and clamping to apply pressure. Each of these is important in achieving a good glue joint. The pieces to be joined should be very smooth and clean to permit close contact. The smoother the surfaces and the better they match, the stronger the joint and the more invisible the glue line. The surfaces should be clean of all oil, dirt, and dust. A light sanding will help with 240 grit or finer paper, followed by vacuuming to remove the dust. Oily woods can be cleaned with acetone. Prepare the surfaces immediately before gluing for best results.

Roll or rub on the glue, don't just squeeze it out onto the surface. You want a thin glue film on each surface with no air bubbles. For larger surfaces you can brush it on. (Clean brushes used with white or yellow glues with warm water.) Spreading glue with your fingers is a bad practice. You need clean hands to work with the pieces, and the oils and dirt on your fingers won't help adhesion. Spread the glue as evenly as possible, using just enough to cover the surfaces. Too little glue will result in a poor bond and too much will result in a messy squeeze out during clamping. Apply the glue to both pieces to ensure a full wetting of both surfaces. Rub the glued sides together to get rid of any air bubbles and then separate them to make sure both are fully covered before the final assembly. At this point you may need to add more glue.

Applying glue and closing the joint should be done rapidly to prevent any pre-curing of the glue. This assembly time will be shorter for the more porous woods and the more viscous glues. Let the glue set a few minutes before clamping so that it

becomes somewhat tacky. This allows it to diffuse into both pieces of wood before pressure squeezes it out of the joint. When the pieces are assembled, remove any excess with a scraper or a damp cloth immediately. Excess glue will slow the drying process. Curing is affected by the temperature, so it's best to avoid gluing if it's less than 70°. I like to bring the piece inside to cure overnight.

Clamping performs the three functions of forcing the glue into the pores and forming the interpenetration region, assuring that the glue line is thin, and holding the pieces together until the setting or curing is complete. Pressure should be applied as uniformly as possible and this may require extra pieces of wood to spread the pressure from the clamp to the project. The clamping pressure is diffused in a fan of about 90° from the clamp head. You need to use enough clamps so that these lines of diffusion overlap at the glue joint as shown in Figure 7. Thus the number of clamps you use depends on both the length and width of the wood being joined. Use an even number of clamps distributed above and below to prevent bowing under pressure. The clamp heads will leave a depression, so if these areas will not be removed in the carving, spread the pressure out by using wood buffer blocks. How much pressure to apply is always a problem so here are a few guidelines:

(1) The pressure applied depends upon the density of the wood. The more dense woods require more pressure to form the proper interpenetration region.

(2) With low viscosity glue, too much pressure can result in an inadequate glue line.

(3) Remember the old adage: "Excessive pressure is no substitute for good matching."

Glue hardening covers assembly time, setting time, curing time, and conditioning

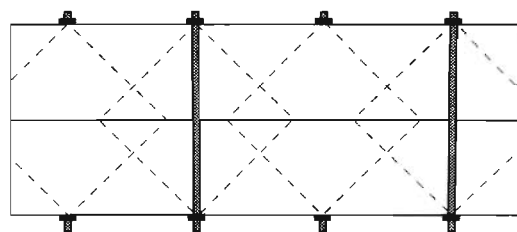
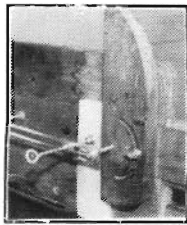


Figure 7. Clamping so Pressure Forces Overlap

time. Assembly time includes shelf life, maximum open assembly time, and maximum closed assembly time. Shelf life is the length of time the glue remains useable after preparation. For the pre-mixed white and yellow glues shelf life is almost indefinite. It can be increased by storing the glue in air-tight containers in a refrigerator. The maximum open assembly time refers to how long the pieces can be separated before they must be brought together, and is about five minutes for the white glues. The maximum closed assembly time is the time period after the pieces are brought together but before clamping pressure is applied. It's usually two to three times as long as the open assembly time and thus about fifteen minutes for white glue.

The setting time is the minimum time that the pieces must remain under clamping pressure. The joint will not be disturbed by clamp removal after this time. Curing time is that required for full bonding strength to be achieved. If possible, leave the pieces clamped even longer or overnight. The conditioning time is that required to allow all moisture to diffuse away from the joint and to permit all the stresses built up during pressurization to be relieved. The newly joined pieces must pass through this conditioning before any final surfacing is done. If you work the wood before it's stabilized, you could end up with a sunken joint. At moderate humidity and room temperature, allow about one week for conditioning.

Whether you're building up an in-the-round carving block or a relief panel, or repairing broken parts of a relief carving, an understanding of the gluing process and the different glues is essential. A properly executed glue joint should be at least as strong as the wood. With patience and care you can laminate your carving blocks so that the glue lines will not be noticeable in the final carvings. **PW**



MasterJig

MasterJig You-Build Kit

Designed for any table saw. The MasterJig is a safe and effective way to master several common wood joints. We include hardware and full instructions, you supply the wood.

\$9.95

Please circle #101



**C & B
Woodworking**

Country Furniture Plans

Fully-illustrated, step-by-step furniture plans from C & B Woodworking are designed for the home woodworker. Our project sampler includes plans for a country quilt rack, a \$4 value.

Catalog \$1.00

Please circle #102



**Woodcraft
Supply**

Free Woodworking Tool Catalog!

Woodcraft Supply offers over 4,000 of the finest quality woodworking tools, books, and supplies in our complete catalog. Free technical assistance. CALL FREE: 1-800-225-1153, Dept 91PW09.

Free

Please circle #103



**Meisel Hardware
Specialties**

Woodworking Plans and Parts

Over 400 easy-to-build woodworking project plans. Nation's leading source for door harp plans and parts, Holstein cow projects, toy plans, country furniture, etc. Over 3000 hard-to-find specialty items. 72-page catalog.

Catalog \$1.00

Please circle #104



**Fourth
Dimension**

Patterns for Wood Cutouts

Catalog of 185 original designs for cutouts that will make money for you and win awards for your outdoor holiday displays. Full-size patterns contain complete instructions. Easy to make.

Catalog \$1.00

Please circle #120



**Elu by
Black & Decker**

Elu Woodworking Tools

Black & Decker is now offering its line of hand crafted Elu woodworking tools in the U.S.—sanders, a power planer and a jointer/spliner—all with a wide range of accessories. For a catalog send \$1.00.

Catalog \$1.00

Please circle #122



**St. George Co.,
Ltd**

Respiratory Protection

Ideal for working with sawdust and all other fine dust particles. Filters air and blows 8 CFM over the wearer's face. Wide vision helmet, lightweight and comfortable.

Free literature

Please circle #123



**Forrest Mfg.
Co. Inc.**

Woodworker II Saw Blade

This is the one blade that you can count on to leave a smooth-sanded surface. Lasts up to 10 to 20 sharpenings. 10" x 40T. Call 1-800-733-7111.

\$94.00

Please circle #140



**Wood-Mizer
Products**

Portable Sawmills

Wood-Mizer® makes a sawmill to fit your needs—from the occasional user to the full-time cutting business. Safe, dependable, efficient, accurate, and built to last. Send for a complete product catalog today.

Free

Please circle #161



**Grizzly
Imports**

Grizzly Imports Catalog

You'll be amazed at the number of new items we've brought on line for 1990. Machinery, accessories and specialty items abound. This catalog is a definite collectible that you'll save for years. Call toll free to get yours: 1-800-541-5537.

Free

Please circle #162



Popular Woodworking

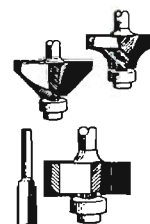
**Popular
Woodworking
Media Kit for
Advertisers**

Advertise in Popular Woodworking

An ad in PW is your tool for increased sales—circulation 110,000 (330,000 readers) and growing! Send for your free Media Kit now. Or, for faster service, call Debra Nowak at (415) 671-9852.

Free

Please circle #163



MLCS, Ltd.

"Must Have" Carbide Tipped Router Bits

8-piece 1/4" shank router bit set includes:

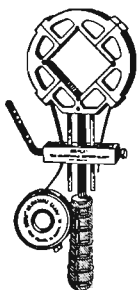
- 3/8" Round Over Bit
- 1/4" Straight Bit
- 1/2" Straight Bit
- 1/2" Flush Trim Bit
- 3/8" Rabbeting Bit
- 45° Chamfer Bit
- 3/8" Key Hole Bit
- 1/2" 14° Dovetail Bit

Makes a special gift

1-800-533-9298

Sale Price \$69.95

Please circle #164



Merle Adjustable Corner Clamp

1-piece clamp with almost limitless capacity—adjustable from 2-5/8" x 2-5/8" to 69" x 69". The quickest way to clamp. Aluminum & steel construction. Forces your project into square. Industrial quality. Quick action. 1-800-533-9298.

MLCS, Ltd.

\$22.95

Please circle #165



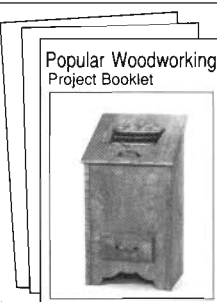
Woodline Tool & Supply

Japanese Tools

The Japan Woodworker's 80-page catalog is loaded with a huge selection of Japanese saws, water-stones, chisels, planes, carving knives, cutlery and garden tools. Send \$1.00 for 1990 catalog and all supplements for two years.

\$1.00

Please circle #181



Popular Woodworking Project Booklets

Project Booklets

Never before published, our storage planter, writing desk & potato & onion bin booklets include everything you need to build your own. Printed on heavy stock.

Special offer—
all three: \$8.00

Please circle #182



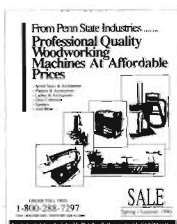
Carbide Tipped Router Bits

We searched with quality on our minds and came up with a line of industrial router bits you will be satisfied with, both in quality and price. We will fit your production needs.

Free literature

Please circle #183

Econ-Abrasives



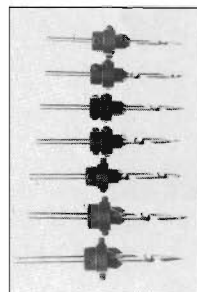
Penn State Industries

Tools & Accessories

Every item discounted! Latest free brochure features Scrollsaws, Planers, Dust Collectors, Lathes, Work Supports and numerous accessories. Valuable discount coupons. 1-800-288-7297.

Free

Please circle #184



HSS Tapered Drill Set

Seven each tapered HSS countersinks/borers, stop collars. With hex wrench, wood case. Screw sizes: 5, 6, 7, 8, 9, 10, and 12.

\$33.99

Please circle #200

Dollar Trading Corporation



Learn Cabinet-making from your TV

Cabinetmaking videos make it easy to learn in your own home. Shorten your learning curve with these 5 videos. All 5 videos \$139.95 plus S&H. Visa/MC. Videos make a great gift.

Catalog \$1.00

Please circle #210

Vidwood



Cascade Tools, Inc.

Shaper Cutters & Router Bits

Carbide-tipped router bits and shaper cutters are recognized worldwide for quality & performance at an affordable price. We use the latest in diamond grinding techniques & CNC equipment to give you exacting profiles. Call for a catalog: 1-800-235-0272

Free

Please circle #221



Color Chips

We now have 5 new colors in addition to mahogany & walnut. They are: azure, grape, strawberry, periwinkle, meadowlark. They are non-toxic and odor-free.

Free

Please circle #222

Truly Persnippity



Woodworkers

The Fine Tools Shop catalog offers products for professional woodworkers and serious hobbyists. Specially selected offerings range from measuring, marking and drafting needs to the finest chisels and carving tools.

\$1.00

Please circle #225

Fine Tools Shop



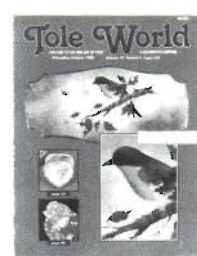
Dumond Chemicals

White Again

Restores grout to its original whiteness. Cleans ceramic tiles and makes bathrooms look brand new! One application lasts for years. Seals grout, water-proofs and guards against soiling.

16 ozs. \$12.45

Please circle #226



Tole World

Step-by-step painting articles with patterns, instructions and full color, by leading decorative artists. Includes features, expert advice, brush stroke workbook, events calendar, profiles, news & more.

1 year/\$15.00

Please circle #228

Tole World
From the publisher of
Popular Woodworking

PW Showcase



Back Issues

More projects! All available back issues of PW (at least 30). Each issue has 4-6 projects with plans, plus all the regular departments that make PW a valuable addition to the woodworker's library.

Popular Woodworking
Back Issues

\$80.00

Please circle #270



Saw Perfect Angles

New Eze-Angle-guide® lets you saw 160 different angles without changing your saw. Now you can instantly cut 45° squares, 22-1/2° octagons, etc. Works on table saws, too.

Steussy Creations

Free brochure

Please circle #280

Writing Desk



Designed for home office use, this sturdy desk is easy and inexpensive to construct. With its two drawers and two shelves, it's perfect for a small woodworking business or any other office use. Students will love it, too!

Popular Woodworking
Project Booklet

\$4.50

Please circle #330

PW Showcase Order Form

PW #56 Sept 1990

Save time, postage and stationery by using this coupon to order all the additional materials you'd like to receive from our advertisers.

How to order:

1. Just circle the numbers on the coupon that appear next to the Showcase items that interest you.
2. Complete the answers to the questions on the order form.
3. Print your name and address on the order form. We must have your ZIP CODE.
4. Total the costs for the priced items, plus \$2.00 to help cover postage and handling charges.
5. Cut out the order form and put it in an envelope with total payment (check, money order, or charge card info) and send to:

Popular Woodworking
Box 2506
Boulder, CO 80329-2506

Tell Us How You Liked This Issue

I. My favorite project in this issue is the:

- | | |
|-------------------------|---------------------------|
| a. Roadrunner Whirligig | e. Country Mailbox |
| b. Toy Carousel | f. Art Deco Linen Cabinet |
| c. Utility/Serving Cart | g. Drum Sanding System |
| d. Piano Music Box | |

II. My second favorite project in this issue is the:

- | | |
|-------------------------|---------------------------|
| a. Roadrunner Whirligig | e. Country Mailbox |
| b. Toy Carousel | f. Art Deco Linen Cabinet |
| c. Utility/Serving Cart | g. Drum Sanding System |
| d. Piano Music Box | |

III. My least favorite project in this issue is the:

- | | |
|-------------------------|---------------------------|
| a. Roadrunner Whirligig | e. Country Mailbox |
| b. Toy Carousel | f. Art Deco Linen Cabinet |
| c. Utility/Serving Cart | g. Drum Sanding System |
| d. Piano Music Box | |

IV. Of the regular features the one I like most is:

- | | |
|---------------------|------------------------|
| a. The Business End | e. Focus on Carving |
| b. Videoscene | f. Wood Types |
| c. Tried and True | g. Out of the Woodwork |
| d. Tool Talk | |

V. Do you ever sell your woodcrafts?

- a. Yes b. No

VI. What is your age?

- a. Under 30 b. 31-40 c. 41-50 d. 51-60 e. Over 60

VII. About how much do you spend on woodworking per month?

- a. Under \$50 b. \$50-\$100 c. \$100-\$200 d. Over \$200

Circle the catalogs and product information you want to receive:

101. \$9.95	163. FREE	222. FREE
102. \$1.00	164. \$69.95	225. \$1.00
103. FREE	165. \$22.95	226. \$12.45
104. \$1.00	181. \$1.00	228. \$15.00
120. \$1.00	182. \$8.00	270. \$80.00
122. \$1.00	183. FREE	280. FREE
123. FREE	184. FREE	330. \$4.50
140. \$94.00	200. \$33.99	340. \$19.97
161. FREE	210. \$1.00	350. \$34.97
162. FREE	221. FREE	

This isn't my copy of Popular Woodworking, but I wish it were. Start my subscription at once for:

- ☐ 1 year (six issues) \$19.97 (circle 340 above)
☐ 2 years (twelve issues) \$34.97 (circle 350 above)

Total Amount for Cash Items Circled: _____

☐ Check Enclosed Handling: \$2.00
☐ Visa ☐ MasterCard Total Payment Enclosed: _____

Card # _____ Exp. _____

Signature (required) _____

Name _____

Address _____

City, State, Zip _____

Coupon Expires November 15, 1990

Respiratory Protection

Kasco
K80S-T5A

- Wide Vision
- Helmet
- Lightweight
- Comfortable
- Niosh Approved



Ideal for use when working with fine sawdust and all other fine dust particles. Filters air and blows 8 CFM over the wearer's face.

For further details, write or telephone: The St. George Co. Ltd., RR#1, St. George, Ontario, NOE 1N0, Tel. (519) 442-2046, Fax (519) 442-7191.

This Could Have Been Your Ad

For information about advertising in *Popular Woodworking*, contact:

Deborah Nowak
Popular Woodworking
1320 Galaxy Way
Concord, CA 94520
(415) 671-9852

PATTERNS

FOR EASY-TO-MAKE WOOD CUTOUTS

★ FULL SIZE ★ COMPLETE INSTRUCTIONS & COLOR GUIDES



INDIAN BOY \$3.00 TURKEY \$3.00 PILGRIMS \$6.00 SNOW MAN \$3.50 JACK O' LANTERN \$3.00 ROMANCE ON ICE \$4.75

ENC. \$2.00 (POST/HAND) WITH ORDER CATALOG \$1.00 (FREE WITH ORDER) NY & NJ RESIDENTS ADD SALES TAX FOURTH DIMENSION (P.W. 70D) 85 HELMAR DRIVE SPENCERPORT, NY 14559

BUILD THIS GAME CHEST



(19"D x 18"H x 30"W)

Show off your woodworking skills AND gain storage space for games, magazines, or other clutter. This handsome, veneer-inlaid game chest looks great in living room, family room, child's room, or den. Mount on casters and game chest doubles as an end table or night stand.

For fully-illustrated, step-by-step plans,

SEND \$9.00 TO:

C & B WOODWORKING
P.O. BOX 373, BLACKWOOD, NJ 08012
PROMPT 1 WEEK DELIVERY

The Japan Woodworker's Catalog is ...

loaded with the best tools you can get your hands on. In our catalog you will find a huge selection of Japanese saws, waterstones, chisels, planes, carving tools, cutlery and books. Send \$1.50 for our catalog and supplements during the next two years.

THE JAPAN WOODWORKER
1731 Clement F7, Alameda, CA 94501
Phone 1-800-537-7820

Sleeveless DRUM SANDER

Uses regular sandpaper — no pre-made sleeves to buy!



Lifetime Guarantee

USE ON:
Drill press, motor, lathe, combo-tools, radial saw, drills.

Twist of key tightens sandpaper to drum. Rubber backing insures long sandpaper wear.

1" x 3" long	\$14.95
2" x 3" long	\$16.95
2 1/2" x 3" long	\$17.95
3" x 3" long	\$18.95
1" and 2" above	\$26.95
Set of 4 above	\$56.95
3/4" x 3" long	\$15.95
2 1/2" x 4 1/2" long	\$22.95
3" x 4 1/2" long	\$24.95
2 1/2" x 6" long	\$27.95
3" x 6" long	\$29.95
Add \$2.50 per order for shipping	

AVAILABLE WITH:
1/4" bore with 1/2", 3/4", or 1" shaft
1/2" 20 RH thread (except 3/4" x 3")
3/4" bore (except 3/4" x 3" and 2" x 3")

MC, Visa, Check or Money order to:
SINGLEY SPECIALTY CO. INC.
P. O. BOX 5087P, GREENSBORO, NC 27403
CALL: (919) 852-8581

Professional Quality Woodworking Machines From PENN STATE INDUSTRIES

Super 125 Planer

Portable with "Power Feed" • Shipped assembled • Retail value over \$600.00

On Sale ... \$349.95

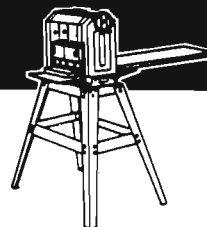


Add \$15
UPS
Freight

This machine will pay for itself time and again by planing your own lumber. At 65 lbs, you can carry this Planer to a job site or mount it permanently in your workshop like any stationary machine. You'll spend hundreds of dollars less for this 12-1/2" power feed Planer than for a traditional stationary model of a similar capacity - with comparable results.

SPECIFICATIONS:

- Knives.... 2ea, 12-1/2" wide, HSS
- Motor - 16 Amp, 115V, 8000 RPM
- Auto Feed rate 26.2 FPM
- Cutting speed 16000 Cuts/min
- Thickness of stock 3/16" to 6"
- Size ... 15-1/2"H X 22"W X 21" Bed
- Max Depth of cut 1/8"
- Machine Weight 65 Lbs



Free plans for roller stand with purchase of rollers

Planer & Accessories Price List

- Super 125 Planer - complete and assembled
#PLA \$349.95 (\$15 UPS)
- Extra Set of 2 Knives - High speed steel, 12-12"
#PKN \$25.00/set (•)
- Dust chute - for vacuum takeoff of wood chips
#PDS ... reg. \$24.00, On Sale \$15.00 (\$3 UPS)
- Planer stand - Heavy duty, 27-1/2" high
#PST ..reg. \$44.00, On Sale..... \$39.00 (\$6 UPS)
- Ball Bearing Rollers - (Minimum purchase 2 rollers)
Build roller stand, infeed/outfeed table etc. w/these 13"x2" Heavy Duty rollers. Includes FREE plans for building roller stand shown above. #BBR \$6.50/ea (\$3 UPS/per order)
- (•) No freight chg if ordered w/Planer, otherwise add \$3 UPS

DC-1 Dust Collector On Sale ... \$189.95

Keep your shop clean and safe from sawdust with our large capacity, commercial style system. This collector has up to 10 times more air flow than a Shop Vac and runs much quieter.

SPECIFICATIONS:

- 1hp, 110/220V (pre wired 110V)
- 610 CFM air flow
- 6990 FPM air speed • 2 Bags 15"dia X 22" • 20 gallon bag
- 4" inlet • Casters on base • Weight 75 lbs • Size - 26"x15"x57"H

Add \$20
UPS
Freight

FREE
with Purchase of DC-1

- Duct Hose
 - 4" To 3" Rigid Adaptor
 - 4" To 2" Flex Adaptor
 - Plans For 2 Stage Setup
 - Piping & Fittings Sources
- Free \$15 Value



We unconditionally guarantee your satisfaction with our fine machines. All of our machines carry a Thirty day Money Back Guarantee and One year Warranty for Parts and Labor.

PENN STATE INDUSTRIES-P

2850 Comly Road • Phila, Pa 19154

Order Toll Free 1-800-288-7297 (Ext 90)

For information 1-215-676-7609 (Ext 15)

Visa, Master, & Discover Card accepted
Pennsylvania residents add 6% Sales Tax

Add UPS Shipping Charges as noted

Continental U.S. only (Call for shipping charges to other locations)

Tool Talk

by Sanford Wilk

You know, they're always coming up with new gadgets and new models of old gadgets; wouldn't it be nice if you could try out a tool and really push it to its limits before you pay good money for it? That's what this new column is all about.

The tools that I write about in "Tool Talk" will be fully tested in order to give you an unbiased review of the tool's special features, abilities and disabilities. To help with the testing of the tools, I have a network of over 50 craftsmen in fields ranging from finish carpentry to cabinetry and furniture-

Sanford Wilk is an organic architect and a builder in San Francisco, CA.

making. Not only do they use the tool for weeks (sometimes months) before submitting a written evaluation to me, they also talk with me about the tool both during and after the test period. The testing is the result of a team effort, and the craftsmen that help to evaluate the equipment make each review more complete, and objective.

In this column, I'll also give you some insight into techniques for using the tools in a straightforward, no-nonsense fashion—sort of like talking to an old friend about shop tools and techniques on a Saturday morning over a cup of java. Tool Talk is dedicated to you, the reader. Any questions, comments, or suggestions are

welcome. To keep you up to date on the latest developments, each column will also have a section called "News and Notes"—short news items about new products. Let me know which of these gadgets you'd like tested in future columns, and I'll see what I can do.

Though no shop is the same in character or size, I will try to give you a look at tools that would fit well into any small shop. In addition to listing the tool's attributes, I'll let you know where you can get more information. Manufacturer's suggested list prices will be shown, and I'll also offer you a glimpse of what you can actually expect to pay for the product.

Black & Decker's Bullet® Drill Bits

For years now, machine shops have been taking regular "jobber" type bits (the common drill bit), and doing some special grinding on them. The result is a bit that resembles a brad-point, but doesn't have the brad-point's limitations. Now Black & Decker is producing a line of bits that are similarly ground, which they call Bullet® pilot-point drill bits.

Unlike a jobber bit, the Bullet® doesn't make all sorts of splinters when it first hits the wood's surface. The Bullet® differs from the jobber in other ways as well—it doesn't need a pilot hole to line up; it

doesn't require even half the force while drilling (great for lower amperage tools); it lasts about five times longer than jobber bits; it doesn't "walk" on the work piece, and for cordless applications it gives you a lot more mileage before you need to recharge. Several design factors contribute to these results. In addition to the pilot-point in the center of the bit's head, the bit's flutes are oversized so that chips are removed faster to reduce binding, and those flutes are back-tapered to give less drag and longer wear. What's more, Black & Decker has totally reversed the stan-

dard obtuse cutting angle found on the jobber, making it acute. This acute cutting edge reduces burrs, and makes a smooth, very accurate hole.

Black & Decker offers Bullet® bits in sets that contain as few as four bits to sets of 29 bits that come with their own metal storage box. Three types are available: high-speed steel (HSS), black oxide-coated, and titanium-coated for metal drilling. Titanium-coated Bullets® aren't available in sets, but they are available in 16 sizes, and you can put together a kit yourself. The titanium bits last about twelve times as long as a normal jobber bit, but they do cost more than the HSS, or black oxide-coated bits. For general woodworking, I recommend a 29-piece set of black oxide-coated bits. The list price for the set is \$186.00, but you can pick them up for as little as \$86.00 if you call around.

Besides being higher quality bits, and producing better results than any jobbers that I've ever used, the Bullets® are economical. We tested three sizes of Bullets® (black oxide type) out of the 29-piece set against three brand new, quality jobber bits, and the results were nothing less than phenomenal. For every four jobbers that burned out, we only spent one Bullet®. This was done using the same wood, the same drill press, and the same speed and depth controls. I think that Black & Decker has really got something here. (Black & Decker, 10 North Park Drive, Hunt Valley, Maryland, 21031, phone (800) 638-0683)





Porter-Cable's Omnijig

The Omnijig is a benchtop tool that expands your shop capabilities by leaps and bounds. Almost every set of plans has some joinery requirement in it. Box joints, half-blind dovetails, tapered sliding dovetails, and half-blind rabbeted dovetails are just a few of the joints that woodworkers commonly use. These joints can be tedious to cut, and sometimes they become complicated. Before using the Omnijig, I dreaded the task of laying out, and cutting through dovetails. My scrap pile seemed to grow substantially (and expensively) when I missed with the router, or made even the slightest error in measuring. That apprehension completely left me when I started using the Omnijig.

The Omnijig can handle stock up to 16" in width, and that makes it suitable for everything from jewelry boxes to small trunks. Acceptable stock thicknesses can vary from 5/16" minimum, all the way up to a fat 1" thick! To understand how the tool works, you need to understand its parts. First is the machine itself; the Omnijig needs to be bolted firmly to the edge of a sturdy bench. The other items that you'll need are a template (the tool comes standard with a 1/2" half-blind dovetail template), a matching router bit, and a router of 7/8 hp, or better.

When you've got the Omnijig bolted down, and the template installed, you adjust the top and front clamps to your material thickness. Next, you loosen the stop bars, insert the work pieces, and clamp them down. The Omnijig's clamping mechanism eliminates the board's cup. Since the unit allows you to cut the tails and the pins at the same time with just one pass, accuracy is kept to a maximum while set-up and cutting time is con-

densed to a minimum. Once the material is clamped into place, adjust the stop bars and tighten them down. The whole process takes less than five minutes, and readying the router will only take you a few minutes more. The router receives the template guide and bit that corresponds to the template; then you set the bit projection. A bit that's set too deep will damage the Omnijig and could injure the operator, so care should be taken while adjusting it. That whole process takes about ten minutes; and once you get used to it, you can do it even quicker. At this point, you're ready to cut the joint. The router just follows the lines of the template, and you should make the cut from right to left to avoid chipping. The total time spent on setup and cutting of a dovetail joint is less than half the time required to do it manually.

The Porter-Cable Omnijig lists for \$395.00 but you can get the unit for around \$279.00. Additional templates list between \$43.00 and \$109.00 and discount houses sell them for about 12% off suggested list. Porter-Cable is so thorough about offering the Omnijig as an integrated unit that they offer an hour-long VHS tape that will help you use the machine to its full potential. The tape, however, isn't something that dealers and catalogs regularly carry, so you might have to call the company's Customer Service Department (800-321-9443, ask for the Advertising Literature Department), and have them send you one. The tape costs \$9.95, but I picked up a few tricks from it that helped me cut more complex joints even easier. (Porter-Cable, P.O. Box 2468, Jackson, TN, 38302, phone 800-321-9443)

Delta 18" Variable Speed Scroll Saw

Delta patented the very first scroll saw in 1923. It had an 8" capacity, and it was powered by turning a hand crank. Things at Delta Machinery have come a long way since then, but the people in charge of engineering still make it a practice to offer new tools; and, in the case of scroll saws, they're making a good thing even better.

The Delta Model #40-601 is an electronically controlled, variable speed scroll saw that handles extremely thin stock with ease, but it also made easy work of some 2" test stock that we used. Most table scroll saws offer one, two, or maybe even three speeds. That's okay for some stock types and thicknesses, but to truly control your cut, you need a variable speed unit. One tester particularly liked the Delta unit because it had a digital readout. He would experiment with different materials at different thicknesses and keep track of the optimum speeds. Then, when he had to cut similar materials again, he simply glanced at the chart pinned on the wall, set the dial until he got the number he wanted, and went-to-town with spectacular results. You can set the machine for as little as 40, to as high as 2,000 cutting strokes per minute, and the electronics maintain the cutting speed under load.

Two other neat features on the #40-601 are the table and the blade-change mechanism. The table is round, and I took a liking to it over other irregularly-shaped tables that I've experienced. Since you make a lot of sharp turns on a scroll saw, the round table just seems to make more



sense. You can work the piece around the table without finding that your hands keep running into the tabletop, and the table is still big enough to handle wide stock. Our tester was able to make tight turns with no problem, and even though he had the speed turned all the way to maximum, and was cutting 8/4 red oak, the machine didn't vibrate too much. Delta tells me that the vibration is controlled by counter-rotating balancers; the end result is one of improved control.

Blade changing on a scroll saw can be a pain, but Delta has incorporated a pivot-mounting system for their blades, and change time is less than a minute once you get the hang of it. This leaves more time for cutting, and makes it easier to

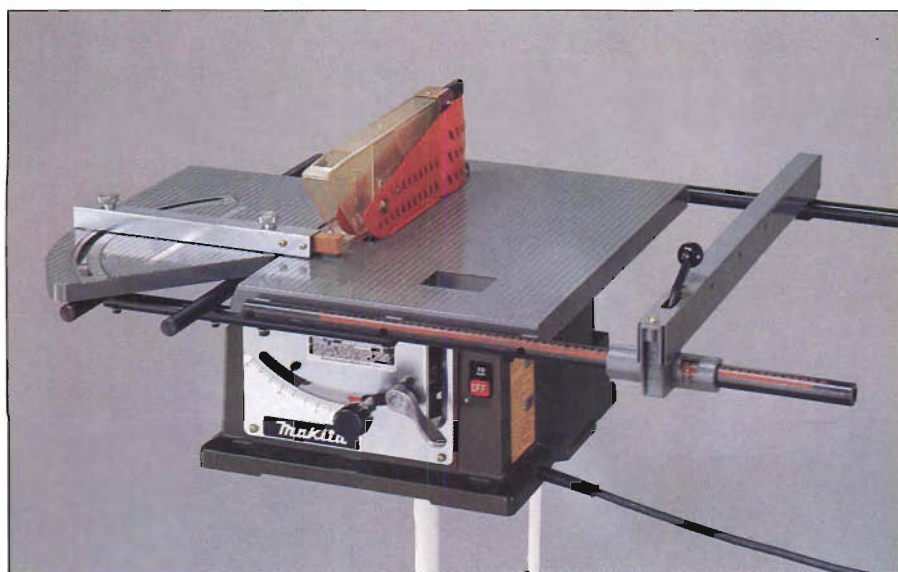
swallow a blade change when you switch the material that you're scrolling. Five-inch skip-tooth blades worked well (when cutting wood), and Delta offers eight different sizes, but you can also use some generic brands with equal results.

With everything going so nicely with the Delta #40-601, you're probably thinking that there must be a catch, and there is one — sort of. The machine's cost is the only reason that a woodworker might be reluctant to purchase one. It lists for \$1,025.00, though I was able to find it selling for \$749.00 (including delivery) through a catalog house. (Delta International Machinery Corp., 246 Alpha Drive, Pittsburgh, PA, 15238, phone 412-963-2400)

ruler guide gives you the rip measurement accurately with one glance.

Makita has also considered power when designing this saw. It boasts a 12 amp, direct-drive, high-tech motor with an electric brake. Our attempts to slow the machine by using saturated wood (about 35% moisture content—when I said saturated, I meant it) did almost nothing to change the machine's cutting speed. It also made easy work of various hardwoods, pressure-treated lumber, and plywoods. Another surprise about the Makita saw was that the guard actually worked! This was a first for me, since even most of the larger, more expensive machines that I have tried have guards that seem to be more dangerous than the consequences of their removal. You can actually leave the Makita's guard in place, and still see what you're doing without it binding on your work.

Among some of the other user-friendly features found on the Makita #2711 are a built-in tool storage area that lets you keep track of the blade wrenches. Another is a



Makita 10" Sliding Table Saw

A table saw is a staple found in almost every workshop. They range in quality from pitiful to extravagant, and prices vary just as much—from between a few hundred to a few thousand dollars. The Makita Model #2711 table saw lists for \$819.00 with free shipping. This makes it affordable for almost any shop, and its features and capabilities make it an even better value.

This ingenious table saw offers a built-in sliding table—great for making accurate crosscuts. Up until now, the drawback with sliders has been their formidable price tags. The large millwork shops could afford them, but the small and medium shops were left out. Makita's saw isn't as large as the sliding table saws found in million-dollar shops, but the Model #2711's sliding table is more than sufficiently sized to satisfy the requirements of

the average woodworker. With the angle of the bevel set to 0°, and the blade at 90°, the slider will easily accommodate a board as wide as 11-3/8", and as long as 40+" with the optional holder set (list \$22.00, sell \$17.50). The saw's only potential handicap is that making a standard rip cut requires the removal of the miter gauge from the sliding table. This really didn't prove to be a problem since it's attached with two oversized knurled knobs. Removing it only takes a few seconds, and no other adjustments are necessary. The benefit of the slider *far* outweighs the few moments of adjustment required for ripping operations.

One of the other well-designed features on the saw is its rip fence. The fence holds its initial setting, locks with a quick, lever-type action, and slides easily along two nicely sized ruler guides. The front

News and Notes

Flat Sanding. Hand Ease brand sander was developed for woodworkers involved in refinishing projects. The sander features an easy-to-grip



handle that reduces hand fatigue and holds a continuous roll of sandpaper. A sticky backing holds the sandpaper to the sander's working surface. (3M Center, building 223-4S, St. Paul, MN 55144)

Get a Grip. Comfort Tape™ provides a soft, non-slip grip for hand tools, and hand-held power tools. It's a durable, closed-cell neoprene foam that's backed with a permanent acrylic adhesive. The tape is resistant to oils, and weather, and it sticks to most surfaces. Available in



"window" that's built into the table top so that the switch can be safely viewed without stooping or taking your eyes off the work. There is also an optional 6" carbide dado blade (list \$45.00, sell \$36.00), and dado blade insert (list \$9.50, sell \$7.50), and even a dust collection hood (list \$69.00, sell \$55.00). The optional stand (list \$83.00, sell \$66.00) assembles easily, but if you're going to be moving the saw around a lot, you might need to reinforce the legs with lateral bracing. Makita will be offering a Porta-Table for the #2711 in the U.S. market as soon as demand calls for it. The Porta-Table is a table, table extension, and outfeed table that makes it easier to handle large panels without a second person. The company already offers it for their smaller, 8-1/4" saw (the 2708W), and hopefully they will be marketing the #2711 version of the Porta-Table soon.

All in all, the Model #2711, 10" sliding table saw offers a lot of good saw for a reasonable price. (Makita USA, Inc., 14930 Northam Street, La Mirada, CA, 90638, phone 714-522-8088)



Ryobi's Radial Arm Saw

Here's a tool that I know should appeal to me as the perfect small shop tool, but I just can't seem to appreciate it as one. It's got some real nice features that most other radial arm saws don't offer: a moulding cutter head, 8" sanding disc, sanding drum, router bit adapter, and the usual

dado blade.

The saw's accessory spindle turns at 18,500 rpm. A gear reduction allows the blade to turn at 5,000 rpm, but that's still about 1,500 higher than the standard radial arm. This higher revving sounds like a good idea, but it draws the saw across the table too quickly, and that makes the Ryobi unit harder to control.

Another problem we had with the saw was due to its design. It's made to be broken down in part so that it transports easily to and from a construction job site. That may be good for a construction carpenter, but it takes away from the beefy composition that's typically required of a shop tool. There seems to be too much "chatter" (vibration noise) coming from the blade, too much play in the turret arm, and the unit doesn't like to keep its alignment if you're the least bit rough with it. Raising and lowering the turret isn't much fun, either. The elevation crank is at the back of the turret arm, and this forces you to either reach over the table, or walk behind it (if you have the room). Yet another limitation of the tool is its capacity. At 90°, it will only cut to a maximum depth of 2-1/8". For beveled, miter cross-cutting, the capacity is further limited to 1-15/16" at 45°. The Ryobi RA-200 lists for \$515.00, and it sells for roughly \$250.00; but unless you're going to use it for light-weight applications, I would recommend that you save your money and buy a bigger machine. They sell for a lot more, but they also make life easier instead of more complicated. (Ryobi America Corp., 1424 Pearman Dairy Road, Anderson, South Carolina, 29625, phone 800-323-4615) **DW**

rolls that are 1" wide X 54" long X 1/8" thick. (Eberle Enterprises, Box 1478, Doylestown, PA 16901, phone 215-340-0299)

Real Chiseling. Mifer chisels, which have been sold in the United States for the past 25 years under a private label, are now available under the manufacturer's name. These chisels are made with a specially formulated chrome vanadium steel with a

Rockwell hardness of 60. The boxwood handles are from the forests of Spain, and a steel ring ensures that there will be no splitting from the mallet blow. These chisels are available in 4-, 6-, and 10-piece sets, packaged in wood cases. (American Clamping Corporation, Box 399, Batavia, NY 14021, phone 800-828-1004)

Bi-Metal Blades. Freud, Inc. announced a full line of bi-metal jig saw blades. Using the latest in bi-metal technology, the manufacturer claims that

these blades will outlast any standard high carbon steel blades at only fractionally higher cost. The new line of blades consists of both Universal and Bosch-type shanks, and range in t. p. i. from 6 to 24 and lengths from 2-3/4" to 4". (Freud, Inc., 218 Feld Ave., High Point, NC 27264, phone 800-334-4107)

Cutting Marathon. The Irwin Company has introduced the Marathon™ blade line which they say lasts up to six times as long as standard carbide-tipped blades. This new thin-kerf blade series has a shoulder that supports the C3 carbide tooth. Heat vents have also been added to the blade, reducing the chance of wood resin build-up that's known to shorten blade life. (The Irwin Company, Wilmington, OH 45177, phone 513-382-3811)



Calendar

If your group is having an event you would like other woodworkers to hear about, please send us all pertinent information at least three months before the opening date. We will publish it for you in *Calendar* free of charge.

California

Date: through August 26
Event: Artistry in Wood '90
Location: Sonoma County Museum, 425 7th St., Santa Rosa
For information, contact: Sonoma County Woodworkers Association, Box 4124, Santa Rosa, CA 95402. Tel. (707) 579-0264

Date: through August 31
Event: Lathe-Turned Objects Exhibition
Location: Highlight Gallery, Mendocino
For information, contact: Clyde Jones, Box 1515, Mendocino, CA 95460. Tel. (707) 937-3132

Date: August 8-12
Event: S. Cal. Woodworking Conference
Location: Harvey Mudd College, Claremont
For information, contact: SCWC, 3825

W. 139th St., Hawthorne, CA 90250. Tel. 213- 679-2485

Date: August 10-12
Event: Crafts Fair
Location: Fort Mason Center, S. F.
For information, contact: American Craft Enterprises, Box 10, New Paltz, NY 12561. Tel. 1-800 836-3470

Date: September 5-October 28
Event: Fine Art of Woodworking Furniture Show
Location: Highlight Gallery, Mendocino
For information, contact: Clyde Jones, Box 1515, Mendocino, CA 95460. Tel. (707) 937-3132

Date: September 8-9
Event: Tri-Valley Woodcarvers Show
Location: The Barn, Livermore
For information, contact: CCG, Box 1195, Cambria, CA 93428

Date: September 22-23
Event: Woodcarving Show
Location: Cambria
For information, contact: Central Coast Chapter, CCG. Tel. (805) 927-5240

Colorado

Date: through August

Event: Classes: 6-10 Upholstery, Stool Construction, 13-24 Wood Sculpture
Location: Snowmass Village
For information, contact: Anderson Ranch Arts Center, Box 5598, Snowmass Village, CO 81615. Tel. (303) 923-3181

Connecticut

Date: August 17-19
Event: Summer Crafts Festival
Location: Berlin Fairgrounds, Berlin
For information, contact: Box 412, Canton, CT 06019. Tel. (203) 693-6335

Date: September through November
Event: Classes: 18th Century Carving Techniques 9/15-16; Evening Woodworking 9/27-11/15; Spindle Turning 10/13-14; Power Tools & Equipment 10/27-28; 18th Century Woodworking Methods 11/3-4
Location: Brookfield
For information, contact: Brookfield Craft Center, 286 Whisconier Rd., Brookfield, CT 06804

Illinois

Date: August 12-15
Event: National Hardware Show
Location: McCormick Place, 23rd & Lakeshore, Chicago
For information, contact: Cahners Exposition Group. Tel. (203) 352-8369

Date: November 3-4
Event: Midwestern Wood Carvers Show
Location: BelleClaire Exposition Hall, 200 S. Belt E., Belleville
For information, contact: Don Lougeay, 1830 E. D St., Belleville, IL 62221. Tel. (618) 233-5970

Iowa

Date: September 13-16
Event: World's Fair of Woodworking
Location: Veterans Memorial Auditorium, Des Moines
For information, contact: Box 1422, Des Moines, IA 50305

Kentucky

Date: October 19-21
Event: Woodworking Show
Location: Commonwealth Convention Center, 221 4th Ave., Louisville
For information, contact: 1516 S. Pontius Ave., Los Angeles, CA 90025. Tel. (213) 477-8521

Maryland

Date: October 6-8
Event: Ward Exhibition of Wildfowl Art
Location: Wicomico Civic Center, Salisbury
For information, contact: Jane Rollins, tel. (800) 742-4988

Date: October 12-14
Event: Baltimore/Washington Wood-

working Show
Location: Festival Hall, Camden & Sharp Sts., Baltimore
For information, contact: 1516 S. Pontius Ave., Los Angeles, CA 90025. Tel. (213) 477-8521

Massachusetts

Date: October 6-8
Event: Seminar: Carve A Finback Whale
Location: Norton
For information, contact: Buyer Woodcarving Studio, 28 Power St., Norton, MA 02766. Tel. (508) 285-9583

Minnesota

Date: September 28-30
Event: Twin Cities Woodworking Show
Location: State Fairgrounds, Snelling & Como Aves., St. Paul
For information, contact: 1516 S. Pontius Ave., Los Angeles, CA 90025. Tel. (213) 477-8521

New Hampshire

Date: through August 12
Event: 57th Annual Craftsman's Fair
Location: Mt. Sunapee State Park, Newbury
For information, contact: League of New Hampshire Craftsmen Foundation, 205 N. Main St., Concord, NH 03301. Tel. (603) 224-1471

New Jersey

Date: September 22-23
Event: Arts & Crafts at Anderson Park
Location: Upper Montclair
For information, contact: Rose Squared Prod., 12 Galaxy Ct., Belle Mead, NJ 08502. Tel. (201) 874-5247

Date: October 6-7
Event: Flemington Crafts Festival
Location: Flemington Fairgrounds
For information, contact: United Craft Enterprises, Box 326, Masonville, NY 13804. Tel. (607) 265-3230

Date: October 13-14
Event: Fall Nomahegan Park Crafts Show
Location: Cranford
For information, contact: Rose Squared Prod., 12 Galaxy Ct., Belle Mead, NJ 08502. Tel. (201) 874-5247

New York

Date: October 5-7
Event: Upstate N. Y. Woodworking Show
Location: Riverside Convention Center, 123 E. Main St., Rochester
For information, contact: 1516 S. Pontius Ave., Los Angeles, CA 90025. Tel. (213) 477-8521

North Carolina

Date: August 13-18

LEARN CABINETMAKING FROM YOUR TV!

PUT THE VIDEO ADVANTAGE TO WORK FOR YOU!



"I'll make you a Pro!"

Roger W. Cliffe

The Video Advantage: Become a real pro! Let Roger Cliffe be your personal guide. His best-selling Cabinetmaker's Video Series allows you to see all the steps in the cutting and building process. View all the steps you'll need to cut, shape, and assemble a professional looking wood-cabinet. If you missed some things, review it... in your own home.

JOIN THE THOUSANDS WHO HAVE ALREADY LEARNED

ABOUT THE VIDEOS:

BUILDING THE CABINET — (VW 101) Did you know that the faceplate controls most cabinet dimensions? Well, Roger demonstrates techniques for face-plate joinery, cabinet assembly, installation of base moulding, and top. Approx. one hour — Price \$29.95

BASIC DRAWER CONSTRUCTION — (VW 102) Have you ever wondered how to select drawer guides? Or how to turn wood scraps into drawer stock? This tape provides information on drawer fits, types of materials, and some general guidelines for hardware selection and installation. Let experience be your guide. Approx. one hour — Price \$29.95

ADVANCED DRAWER CONSTRUCTION — (VW 103) When do you cut a locking drawer joint on the table saw? Here, you'll see how to develop a drawing for complex drawer joinery, use French dovetails, tongue/dado joints, and locking drawer corner joints. Step by step. Assuring your success. Approx. one hour — \$29.95

BASIC DOOR CONSTRUCTION — (VW 104) What are the 'correct' tolerances for fitting a door in an opening? Come to understand the differences between flush, lip and overlay doors. Tolerances, allowances, and dimensions, glass stop, or decorative moulding. It's all here. Learn from a master! Approx. one hour — \$29.95

ADVANCED DOOR CONSTRUCTION — (VW 105) Can you describe three different ways of cutting a raised panel using the table and radial arm saw? Or can you layout and cut mortise and tenon joints for use with raised panel doors? Learn layout secrets for positioning mortise. Tips to be a real pro! Approx. one-and-one-half hours — \$34.95

Get started today. Call for your set. Have your credit card number handy. (MasterCard and Visa only.) Save even more when you order all five videos for \$139.95.

To order this valuable Cabinet-maker's Video Series, call

1-800-383-9067

VIDEOS MAKE A GREAT GIFT!

Event: Class: Swiss Cooperage
Location: Marshall
For information, contact: Country Workshops, 90 Mill Creek Rd., Marshall NC 28753. Tel. (704) 656-2280

Date: August 13-24

Event: Class: Design in Wood
Location: Penland School of Crafts
For information, contact: Registrar, Penland School, Penland, NC 28765. Tel. (704) 765-2359

Date: September 21-23

Event: Woodworking Show
Location: Benton Convention Center, Winston-Salem
For information, contact: WANA, Box 706, Plymouth, NH 03264. Tel. (800) 521-7623

Date: September 23-27

Event: International Wood Collectors Society Annual Meeting
Location: Kanuga Center, Hendersonville
For information, contact: Richard Herman, Box 1759, Hendersonville, NC 28793. Tel. (704) 693-8241

Ohio

Date: September 14-16

Event: Columbus Woodworking Show
Location: Ohio Expositions Center, 632 E. 11th Ave., Columbus
For information, contact: 1516 S. Pontius Ave., Los Angeles, CA 90025. Tel. (213) 477-8521

Oklahoma

Date: November 9-11

Event: Wonderful World of Wood Carvers Show & Sale
Location: Southroads Mall, 41st & S. Yale, Tulsa
For information, contact: David Davies, 8274 E. 33rd St., Tulsa, OK 74145. Tel. (918) 664-8971

Pennsylvania

Date: September 8-9

Event: Pennsylvania Crafts Festival
Location: Grange Fairgrounds, Wrightstown
For information, contact: United Craft Enterprises, Box 326, Masonville, Ny 13804. Tel. (607) 265-3230

Date: September 21-23

Event: Tri-State Woodworking Show
Location: Pittsburgh ExpoMart, 105 Mall Blvd., Monroeville
For information, contact: 1516 S. Pon-

tius Ave., Los Angeles, CA 90025. Tel. (213) 477-8521

Tennessee

Date: September 21-22

Event: Seminar: Log It, Saw It & Dry It
Location: Norris
For information, contact: Bill Parrish, TVA Forestry Bldg., Norris, TN 37828. Tel. (615) 632-1656

Vermont

Date: August 14-18

Event: Woodcarvers Week
Location: Morrisville
For information, contact: C. A. Brown, Box 268, Waterville, VT 05492. Tel. (802) 644-5039

Virginia

Date: through August 19

Event: Furniture by Wendell Castle
Location: Virginia Museum of Fine Arts
For information, contact: Detroit Institute of Arts, 5200 Woodward Ave., Detroit, MI, 48202. Tel. (313) 833-7963

Washington

Date: August 2-September 30

Event: Exhibition: Curly Colorations by Michael Neiman
Location: Pioneer Square, Seattle
For information, contact: Cheryl Peterson, Northwest Gallery of Fine Woodworking, tel. (206) 625-0542

Date: slide deadline September 1

Event: It's About Time Clock Show, opening October 25
Location: Artwood, Bellingham
For information, contact: Artwood, 1000 Harris Ave., Bellingham, WA 98225. Tel. (206) 647-1628

Date: October 19-21

Event: Artistry in Wood 1990 Carving Show & Sale
Location: Walk in the Wild Zoo, Spokane
For information, contact: Dan Eubank, E. 603 Rich, Spokane, WA 99207. Tel. (509) 487-3319

Canada

Date: through October 7

Event: International Turned Object Show
Location: Museum of Civilization, Ottawa
For information, contact: Sarah Tanguy or Jonathon Glus at the International Sculpture Center, 1050 Potomac Street, N. W., Washington, D. C. 20007. Tel. (202) 965-6066

VISIT THE SHOW NEAR YOU!

- Free Workshops • Door Prize •
- Hundreds of Products •
- Seminars by Mastercraftsmen •

★ **The Woodworking Shows** ★
 machinery tools • supplies

See the Widest Variety of Woodworking Products All Under One Roof!!

HUNDREDS OF ITEMS! NEW PRODUCTS! Machinery • Power & Hand Tools • Supplies

COMING IN 1990-1991

- | | |
|-------------------|------------------|
| • Atlanta | • Milwaukee |
| • Baltimore | • Nebraska |
| • Calgary | • No. California |
| • Charlotte | • Oregon |
| • Chicago | • Pittsburgh |
| • Cincinnati | • Richmond |
| • Colorado | • Rochester |
| • Columbus | • St. Louis |
| • Dallas | • Sacramento |
| • Delaware Valley | • Salt Lake City |
| • Detroit | • San Diego |
| • Indianapolis | • Seattle |
| • Kansas City | • So. California |
| • Louisville | • Twin Cities |

1-800-826-8257 or 213-477-8521

Call NOW to be placed on mailing list for FREE Brochure & Discount Coupons
 Phone Hours 8-5 Pacific Time Weekdays

Wood-Mizer®

World's Largest Manufacturer Of Portable Sawmills



OWN YOUR OWN SAWMILL

Four Models To Choose From
SAVE MONEY — CUT YOUR OWN LUMBER

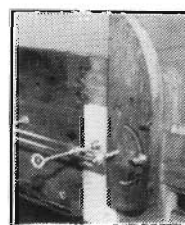
- Remote hydraulic log handling
- Capacities up to 32" in dia. by 33' long
- Portable—precise—rugged
- Efficient—more lumber per log

CALL FOR FREE CATALOG

1(800)553-0219

FREE In Indiana call: (317) 271-1542
 44-page catalog or use your MasterCard or VISA to order our 50-minute demonstration video—\$10.00

Wood-Mizer Products, Inc. • Dept. 0000
 8180 W. 10th St., Indianapolis, IN 46214-2430



MasterJig

MasterJig You-Build Kit

Designed for any table saw. The MasterJig is a safe & effective way to master several common wood joints. We include hardware & full instructions, you supply the wood. Send \$9.95 check or money order to:

MasterJig
 P.O. Box 405 Dept. B
 Upper Sandusky, Ohio 43351

Breathe Easier!



Powered Air Respirators for Wood Dust

\$279 Model AGH1

Excellent for all woodworking jobs which create "DUST." Also offers eye protection. Can be worn with beard and glasses. Systems also available for paint and lacquer fumes.

AIRSTREAM DUST HELMETS

16 Division St. W. Elbow Lake, MN 56531
 Toll Free 1-800-328-1792 or 218-685-4457

TOOLS

WOODTURNING LATHES; bowl, spindle, large swing, long bed, slow speed. DeRose & Co., Box 150, Mechanicsville, VA 23111. (804) 746-1705

"WELD" YOUR OWN BAND SAW BLADES. Plans \$3.00 + SASE to J. K. Woodcraft, 3398 Aquinas, Rochester, MI 48309

Electro Band Saw Brazier pick up from #55, p. 87

ANTIQUE AND USED WOODWORKING TOOLS. Free illustrated list. Ron Farley, Box 793W, Metamora, IL 61548

ROUTER BITS AND SHAPER CUTTERS custom made to order. For free brochure or information call or write: True Cut Tool Corporation, 1074 Hwy 93 South, Victor, MT 59875. Tel. 1(800) 262-2487

40% DISCOUNT, brass screws, escutcheon pins, tools. Small quantities, free catalog. Elwick, Dept. 780, 230 Woods Lane, Somerdale, NJ 08083

WHY NOT MAKE DOVETAILS EASY? Use our template marking method. Instructions and template, \$8.95. DP, Box 116, Elk River, MN 55330

TABLESTROKE-SIDESTROKE SANDERS: \$160 to \$1200. Kits: \$45 to \$570. McCall House, Box 1945-K, Lenoir, NC 28645. (704) 758-1991

PLANS AND KITS

EARLY AMERICAN STYLE MIRRORING WALL SCONCE, COMPLETE FULL-SIZE PLANS. Send \$3.99 each, check or money order, to: LEXICO Enterprises, Dept. B. 66 Brown St., Croswell, Michigan 48422

SHUTTERS-INEXPENSIVE AND EASY. Make your own for as little as \$4.00 each. Plan \$4.00. RAM Enterprises, P.O. Box 248, Hales Corners, WI 53130

COMPLETE PLANS to build 18th-century style hooded doll cradle. Send \$4.99 each, check or money order, to: LEXICO Enterprises, Dept. A, 66 Brown St., Croswell, Michigan 48422

UNIQUE PATIO TABLE 40" Dia. Folds to 3" thick. Plans \$10.00; plans plus redwood kit \$69.95. LaRae, Box 203PM, Blanca, CO 81123

CLOCK PLANS—Make handcrafted clocks for gifts or profit. 6 plans \$5.00. Kent Anderson, 107 O'Neil, Ames, IA 50010

BUILD YOUR OWN rustic 4-foot outdoor swing and frame. Maintenance-free. Complete plans and diagrams \$4.00. Wood-Chuck, P.O. Box 686, Slidell, LA 70459

BUILD YOUR OWN CEDAR-LINED CHEST. (47.5" X 20" X 21") Step-by-step guide. Chests make beautiful gift ideas. Send \$8.95 to Frederick Designs, Rt. 3, Paris, AR 72855

ECONOMY FURNITURE PLANS. Dressers, chests, tables, and more. Material list and tips. Send \$14.95 to: CJ, Drawer 328, Talladega, AL 35160

FREE BROCHURE—Wooden toy parts, patterns, books. Catalog: \$1.00. Woodentoy, Box 40344-PW, Grand Junction, CO 81504

INVENTORS! Can you patent and profit from your idea? Call AMERICAN INVENTORS CORPORATION for free information. Over a decade of service 1 (800) 338-5656. In Massachusetts or Canada call (413) 568-3753

WEEKEND WOODTURNER'S 10 unique woodturning projects that make great gifts and show items. Not the typical rolling pin or vase. Complete instructions and designs. \$7.95 plus \$1 postage and handling. SAGE DESIGNS: P.O. Box 3033, Dept. PW1, Redwood City, CA 94064

CUSTOMIZE YOUR CLOSETS—Do it yourself for pennies. Don't pay someone big \$. Step-by-step architects plans \$6.95. DM Systems, P.O. Box 59325, Schaumburg, IL 60159

AIRPLANES TO ZEBRAS 100 full-size puzzle patterns; send \$4.95 to Apple Tree Crafts Patterns, 289 Pelham St., Methuen, MA 01844

BUILD UNIQUE CONTAINER TO SORT RECYCLABLE GOODS. Build for self or to sell for extra income. Plans \$5.00. American Crafters, Box 127, Dexter, MI 48130



SIMPLE TO MAKE * FUN * PROFITABLE

- 200 pattern packet for scroll, band & jigsaws
- "Country Critters" - 100 patterns, unique projects
- 6 enjoyable "Wind-Action" whirligigs
- "Country Classics" - best selling country projects
- 100 yard ornaments, animals, birds and more
- 17 "Show Stoppers" - craft show best sellers

Send \$7.00 per packet or 3 FOR ONLY \$14.00.

Fast Service • Satisfaction Guaranteed!

ACCENTS Dept. MR80, Box 7387, Gonic, NH 03867
Catalog of 1000 patterns \$2.00 (Free with order)

MAKE YOUR OWN "Combo, Walking Stick and Boot Saver". Fun at parties. Easy week-end project. Dave Kresser, 2021 E. Madison Ave., El Cajon, CA 92019

UNIQUE BIRDHOUSES! Chaiet with pool, Totem Pole, Covered Wagon! Plans, \$5.00. Bradys, R. 2, Box 33C-PW, Delavan, WI 53115

UNIQUE SCROLL PATTERNS: 14 large silhouettes in frames, to 7 1/2" X 10 1/2". Fisherman, Owls, Plowing Farmer, Deer, Geese, Unicorn and more. Send \$9.95. J&L Wood, P.O. Box 97, Canton, IL 61520

DIY PLANS FOR INDOOR/OUTDOOR furniture, workbench, children's toys, etc. Catalog \$1.00. LLEPW, Box 908, Cornville, AZ 86325

WOODEN GEARED, WEIGHT-DRIVEN, pendulum regulated clock plans. Average skill level. \$10.00. BOB MEYER, Box 275, Elgin, MN 55932

MAKE WOODEN TOYS, whirligigs, door harps, dollhouses, clocks, music boxes, weather instruments, crafts, furniture with our plans, parts, kits, supplies. Catalog \$1.00. (614) 484-4363. Cherry Tree Toys, Belmont, OH 43718-0369

ROUGHED-OUT BLANKS, 42 different 80% roughed-out basswood blanks of birds, animals, and characters. Also supplies. Free brochure with SASE to West Falls Woodcarving P. 7458 Ellicott Road, West Falls, NY 14170. (716) 662-3648

GUITAR, BANJO, MANDOLIN, VIOLIN and dulcimer kits. Finishing supplies. Free 96-page catalog. Stewart-MacDonald, Box 900P, Athens, OH 45701. Tel. 800-848-2273

BUILD YOUR OWN WATERBED AND SAVE. Mattresses. Heaters. Massage Systems. Hardware. Packages, MORE!! Send \$2.00 for Catalog with FREE plan set. Woodins' Waterbed Connection; 45 Industrial Park Rd., Dept PW, Albany, NY 12206

MAKE BANDSAW TOYS FROM 2 X 4 SCRAPS! 1957 Corvette, 1957 Chevy and three more full-size patterns - Excellent money-makers! FREE brochure with SASE. Woodcrafts by John Daly, Rt. 10-Box 708, Lake City, FL 32055

PLANS FOR 350 + TOOLS Catalog \$1.00 (refundable). Wood-Met Services, Dept. PW, 3314 Shoff Circle, Peoria, IL 61604

COMPLETE PLANS TO 4 DIFFERENT, easy to build gun cabinets. Our biggest seller! \$6.50. Planlan, Box 473, Bridgeport, NE 68336

SAW EXTENSION TABLE: Attached to your radial arm, jig, or table saw to make cutting more accurate and safe. Four foot long and sturdy. Easy to build. Compact storage. Detailed plans. \$7.95. Leisure, Box 111-B, Champlin, MN 55316

ADULT-SIZE ROCKING HORSE plans. Fun, easy. Great gift. \$8.50. Rocking Dobbin Ranch, 7172 Summitrose Street, Tujunga, CA 91042

EXCITING NEW GAME! Fun for all ages. Send \$6.00 to: Gameplan, 303 Lynwood Dr., Houma, LA 70360

WINDOW SEAT/STORAGE. Easy, step-by-step plans. \$8.00. GNA Services-PW, P.O. Box 982, Andover, MA 01810

CRAFT SHOW BEST SELLER. Unique designed picture frames, no miters. Excellent profits. First time offered only \$5.00. Kent Stewart, Rt. 1, Box 376B, Cuero, TX 77954

START YOUR OWN HOME GYM. Detailed easy to follow plans. \$3.00 plus SASE. M. Driver Enterprises, P.O. Box 27809, Memphis, TN 38127

VICTORIAN GINGERBREAD and screendoor patterns. Great money-maker. Sample of 20 full-size plans, \$7.00. Catalog \$1.00. Smart Designs, Dept. PW, Box 112, Hanford, CA 93232

MAKE TOPSELLING "COUNTRY WOODCRAFTS!" Over 850 fun, profitable designs. Catalog \$1.00. Winfield Collection, PW60C, Fenton, MI 48430

REAL SCROLL SAW PATTERNS—Not for band saws. Full size. Seven turn-of-century antique cars. Unique, very detailed. Sales proven. \$9.00. Memory Lane, 5367-C East Mountain Street (P-3), Stone Mountain, GA 30083

8' PICNIC TABLE AND OAK STEP STOOL PLANS. \$3.00 each, \$5.00 for both. Specify which plans when ordering. Woodco, P.O. Box 2128, Hanover, MA 02339

FULL-SIZE PATTERN AND INSTRUCTIONS for a 9" country horse that "claps" its feet while rocking. Send \$2.95 and long SASE to M.E., Box 130, Orfordville, WI 53576

PLANS FOR POLLUTION-FREE WATERER for birds/wildlife. \$6.00. SKYWATER, Box 607, Big Spring, TX 79721-0607

PLAYHOUSES, DOG HOUSES, SHEDS, PICNIC TABLES and More. Detailed plans. Send \$1.00 for brochure. RBR Woodworking, Box 295, St. Michael, Minn 55376

RELAX IN THE OUTDOORS on your bench swing. Plans for swing and free-standing frame. Send \$5.00 and SASE to R. Johnson, R.R. 1, Box 139, Trimont, MN 56176

"WELD" YOUR OWN BAND SAW BLADES KIT—Jig \$19.95. J. K. Woodcraft-PW, 3398 Aquinas, Rochester, MI 48309

PROFITABLE SOUTHWEST PATTERNS Coyotes, cactus, much more. Catalog \$2.00. TLC, Box 6162B, Scottsdale, AZ 85261-6162

BONE CREATURES! Dinosaurs, Wildlife Series. Plans, wood kits. From \$4.95. Collectable. Great for home, school, office. Brochure \$1.00 (credited). Write: John Generali, 12 Royal Palms Dr. Dept. 13, Austin, TX 78744

NEW! **BUILD THIS ALL WOOD CLOCK**

- ◆ Open concept design
- ◆ Hardwood mechanism parts available

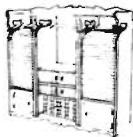
For fully detailed plans and drawings
Send \$20 US (VISA accepted) to:

JRS ONLY DESIGNS
P.O. Box 1030 Brantford,
Ontario, Canada N3T 5S7

14" x 20"
\$400.00
Value

ROLL TOP ENTERTAINMENT CENTER

Build this unique TV/stereo cabinet with two roll top doors, four roll back doors w/bayonet locking devices, and two additional storage units. Plans \$6.00. Kevin Winter, RR2, Box 126, Mitchell, SD 57301.



INNOVATIVE DESK PLANS requiring only common tools. Sturdy, lightweight design. \$5. JBG, Box 17035, Red Bank, TN 37415

SUPER WOODCRAFT PATTERNS windmills, wells, vanes, whirligigs, bird houses, jigsawing for fun or profit. Catalog \$1. CRAFTERS, 11840 North U.S. 27, Dewitt, MI 48820

WOODS

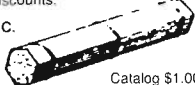
"GOOD WOOD" PENNSYLVANIA HARDWOODS. Over 2000 sizes, 12 species. 1/8" to 2" thick. Surfaced, kiln-dried. Small orders welcome. Free catalogue: Croftwood Mills. RD #1 Box 14L, Driftwood, PA 15832

EXOTIC HAWAIIAN HARDWOODS—bundles of clear kiln dried koa, mango and other exotic woods. Slabs, turning squares, figured woods. Custom wood products also available. Call or write for list and price information. West Maui Mountain Trading Company—Fax 808-878-2803, business 808-878-2705. RR1, 263 Kula Hwy., Kula, HI 96790

DOWELS — PLUGS — PEGS

Manufacturer Direct
Largest & finest selection Oak, Walnut, Hickory, Maple, Cherry, Mahogany, Teak, even treated dowels. Quantity discounts.

MIDWEST DOWEL WORKS, INC.
4631 Hutchinson Road
Cincinnati, OH 45248
(513) 574-8488



Catalog \$1.00

FIGURED MAPLE—QUILTED, BURL, CURLY, SPALTED. Boards and Blocks. Alaskan Yellow Cedar. Randle Woods, Box 96, Randle, WA 98377. (206) 497-2071

KILN-DRIED HARDWOOD AND PINE LUMBER, paneling, flooring. Ceramic tile inserts. Free Catalog. Catskill Mountain Lumber, Box 450, Swan Lake, NY 12783. (800) 828-9663

(NJ) **AUSTRALIAN AND WESTERN** turning blocks, n.t., burl & figured. Call (609) 396-2402 or write: S. Price, 3 Cornwall Ave., Trenton, NJ 08618 (0088405)

BURL, FIGURED LUMBER—Most Western species, squares, slabs, whole. Sample kits. SASE list: Eureka Hardwood Supply, 3346 C St., Eureka, CA 95501. (707) 445-3371

FLORIDA CYPRESS \$1.75 Bd. Ft. S2S. Superior for adirondack chairs and outdoor furniture. Plans, lumber, kits, Kd. Free brochure. B. Martin, 2425 Herculana, Hernando, FL 32642

MESQUITE LUMBER, SASE for prices. Include \$2.00 for sample. H. Nordmeyer, P.O. Box 68, Knippa, TX 78870

BOOKS AND CATALOGS

101 PATTERNS FOR WOODWORKING, tole painting and wood burning. Great ideas for home, gifts or profit. Send \$7.95 to Creative Lines, Box 436-PW, Roy, UT 84067

FREE ILLUSTRATED CATALOG of very fine woodworker's hand tools, books, and accessories. Highest quality craftsman tools from Primus, Adjustable Clamp, Sorby, Maiples, Sandvik, Bessey, and many other manufacturers at prices you can afford. Kreative Link, Department PW2, Box 2347, Sandy, UT 84091

BOOK OF 88 EASY-TO-MAKE aids for seniors. Use only inexpensive tools and materials. \$15.90 postpaid. More details free: AWE, Box 1150-PW, Chino Valley, AZ 86323

VIDEOS, BOOKS ON ELECTRICAL wiring, plumbing, carpentry, welding, upholstery and 100's of other titles. AAVIM, 120 Engineering Center, Athens, GA 30602. 1-800-228-4689

EXCITING NEW FOLK ART PATTERNS. Including step by step photos and instructions for wood carvers of all levels. Farm animals, wagons, Santas, Amish, toys, weather vanes, shriners, dust boxes, carousel, and books, FREE BROCHURE. SASE Billy J. Smith, 6024 E. McKellips Rd., Suite 4107, Mesa, AZ 85205

50,000+ CATALOGS LISTED. Sources for anything! \$5.95. Catalogs, Box 92452L, Atlanta, GA 30314

FREE ILLUSTRATED CATALOG of books for woodworkers: instructions, scaled drawings, patterns for furniture, toys, house carpentry, duck decoy, bird and figure carving, chip carving, wood sculpture, lathe work, more. Most \$4.00 to \$6.00. Write: Dover Publications, Dept. A226, 31 E. 2nd Street, Mineola, NY 11501

BUSINESS OPPORTUNITIES

IDEAL WOODWORKING BUSINESS. Unusual money-maker. Work home. Send stamp: Pineco, 897-3 Mammoth, Manchester, NH 03104

750% PROFIT...FROM YOUR WOODWORKING. Others do the selling. Veteran explains method. Rush \$1 for details. Grapevine Publications, 242-F Shoreham, Toledo, OH 43612

ADVERTISE FREE in national magazines, newspapers, postcard decks and package inserts. \$8.95 Directory, Specialties, Box 2053, Kensington, MD 20891

PRODUCE YOUR OWN MOULDING! Make big \$\$\$ by grinding your own knives. Match any pattern. Ovals, Circles. Send \$9.95 for complete instructions. Pacific Resource, 2966 Diamond, Suite 232, San Francisco, CA 94131

EARN BIG \$\$\$ WITH YOUR PROJECTS! Proven book tells how! Guaranteed satisfaction! Order now! Only \$5.00! ALCO, 2030 Danforth PW, OR 43618

BOOK SHOWS YOU HOW TO SELL WHAT YOU MAKE. Covers selling, pricing, credit, everything. Satisfaction guaranteed. \$5.00. Inprint, Box 687PW, Farmingdale, NJ 07727

REMARKABLE TEXAS PUZZLECRAFTS! Plans and kits. Ideal business. Fascinating designs with sample \$3. Scotlyn, RTI-40, Bangs, TX 76823

LET THE GOVERNMENT FINANCE your woodworking business. Grants/loans to \$500,000. Free recorded message: 707-448-0270. (KC1)

MISCELLANEOUS

HIDE GLUE—Woodworking and Glass Chipping. 11 Grades to choose from. Call or write for price list and technical information. Bjorn Industries, Inc., Box 1280, Matthews, NC 28106. 704-845-2288

POST OFFICE BOX BRONZE DOORS; No. 1 \$5.00; No. 2 \$6.00; No. 3 \$9.00, plus \$1.00 each shipping. SASE: Hubbert Woodcrafts, P.O. Box 1415, Fletcher, NC 28732. (704) 687-0350

INFORMATIVE 208-PAGE CATALOG for woodworkers, woodcarvers, upholsterers, antique restorers, including many unusual, hard-to-find items. Send \$1.00 to Van Dyke's, Dept. 50, Woonsocket, SD 57385

VILLA MARIA WOOD WORKSHOPS, Aug. 12-18, 1990; carving classes in caricature, birds, waterfowl, relief, marquetry. P. O. Box 37051, Minneapolis, MN 55431

STOP! Looking for wood supplies: Shaker pegs, candle cups, mug pegs. 100 for \$16.95 postpaid. Continental US only. Call 1-800-255-1335 or 1-615-437-2295. Send order to Benny's Woodworks, P.O. Box 840, Shelbyville, TN 37160. Catalog \$1.00 or free with order.

EASE MARKING TASKS with peel/stick measure tape. QUICK, EASY layout for: Fasteners, Drilling, Placing components, patterns, Cutoff gauges, etc. NO WASTE: number footage as needed. 3/4" X 50' \$3.95, 3/4" X 100' \$5.95 Postpaid: Akseals, Box 1544, Kenai, AK 99611-1544

VACUUM CLEANERS "Discount Prices" New Rainbow \$599.95. Kirby, Filter Queen, Tri-Star, Panasonic, Details: ABC Vacuum Warehouse, 6720 Burnet-PW, Austin, TX 78757 (512) 459-7643

FINISHING PASTE WAX FOR FURNITURE; Recipe: Easy to make, save money. Send \$7.00 and SASE to, Heart of Pine Woodworks: 8320 Kathleen Rd., Lakeland, FL 33809

BUILDING? RESTORING? REPAIRING? Use Chem-Tech, the epoxy glue professionals use. Strength and reliability proven in boats and aircraft over 15 years. Introductory Offer: 1/2 pt. T-88 Epoxy Glue only \$9.95 ppd. USA. Orders shipped within 48 hrs. Technical staff on call to answer your questions. Chem-Tech, Dept. PW, 4669 Lander Rd., Chagrin Falls, OH 44022. (216) 248-0770. VISA/MC

WOODCARVING—Weekly classes; pattern books, blanks, video on whale carving. SASE: Buyer Woodcarving Studio, 28 Power Street, Norton, MA 02766

SPRAY-ONSUEDE: Free Brochure (sample enclosed). Don-Jer Products, Ilene Court-Bldg. 8G, Bellemead, NJ 08502, (800) 336-6537

WOOD MODELS/PROTOTYPES: display new products at National Trade Show. INPEX-PW, 701 Smithfield, Pittsburgh, PA 15222. (412) 288-1343

CLASSIFIED INFORMATION:

Classified Rate: \$1.50 per word; 15-word minimum. **One-Inch Marketplace:** \$150 per issue. Payment must accompany all ads (not commissionable). **Deadline for Issue #56 (September 1990)** is June 1, 1990. **Popular Woodworking**, 1320 Galaxy Way, Concord, CA 94520, (415) 671-9852.

Index to Advertisers

Airstream Dust Helmets	85
Black & Decker (Elu)	92
C & B Woodworking	79
Cascade Tools	12
Delta International Machinery	3
Dollar Trading Corp.	15
Econ-Abrasives	17
Everlast Saw and Carbide	12
Forrest Manufacturing Co.	18
Fourth Dimension	79
Grizzly Imports	2
Klockit	17
Lignomat USA	16
MasterJig	85
Meisel Hardware	3
MLCS Ltd.	9
Penn State	79
Rodman and Co., Inc.	7
Singley Specialty Co., Inc.	79
SteussyCreations	17
The Fine Tool Shops	15
The Japan Woodworker	79
The St. George Co., Ltd.	79
The Woodworking Shows	85
Truly Persnippity	7
Vidwood	84
Watco	13
Woodcraft Supply Corp.	16
Woodkraft Manufacturing	17
Wood-Mizer	85

Cherry



Douglas E. Swager

By Ken Textor

The first time I mentioned using cherry in a project, the customer hesitated and frowned. "Something wrong?" I asked.

"Well," she said, "it seems a shame to cut down such a lovely, useful tree just to make a cabinet."

"No, no," I laughed. "This wood doesn't come from the trees that give us cherry pies. It grows deep in the forest and you can hardly even see its tiny white blossoms when they come out."

Ken Textor is a woodworker and writer in Arrowsic, Maine.

"Oh?" she said, brightening.

"Sure," I said, "cherry trees are not scarce and are as abundant as pine in some places. But it's a lot nicer looking than a half-dozen other hardwoods we could use."

Convinced, she commissioned me to build a handsome corner hutch in her kitchen. She had a sense of humor, too; along with final payment, she brought me a piece of cherry pie.

General Description

The tree most commonly used for commercially available cherry boards is black cherry, with an occasional pin cherry board mixed in. Black cherry (*prunus serotina Ehrh.*) is actually in the larger family of plum and cherry trees, which includes dozens of ornamental and agriculturally important species. It does bear a tiny fruit which is not edible by humans, although birds love them.

Black cherry is found in almost any deciduous forest east of the Mississippi, growing on a variety of soils but making its best progress on rich, moist land. Some foresters say cherry's rapid growth makes it a "hardwood of the future." Compared with oaks, maples and other common hardwoods, cherry grows much more rapidly and should be commercially available long after other hardwoods are

scarce. The wood itself is about as hard as oak or maple, but much lighter in weight. Its tensile strength is also almost equal to most common woodworking hardwoods. Its high lightness-to-strength ratio explains why it's so popular for use in furniture, particularly in chairs and tables which are likely to be moved around a lot. Its color is also unique and very attractive. The sapwood is light yellowish-white and the heartwood generally red-brown, although some swirls of nearly black can work into the grain. Over time, however, all of these colors tend to darken somewhat. Thus cherry is most appropriate for rooms that receive a lot of light.

Traditionally, cherry has been used in cabinetmaking, interior finishing, woodenware (plates, goblets, etc.), veneers and furniture. Lately, it has also found some popularity as a flooring wood. Again, though, cherry flooring should be used only in rooms that receive plenty of light. Otherwise, once it darkens, it can make a poorly lit room feel like a dungeon.

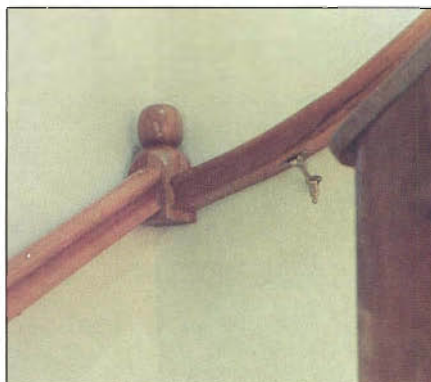
Working Properties

Cherry is fairly easy to work, although it's not as versatile as some hardwoods. It is somewhat brittle, so don't bother trying to make something like bow-backed chairs out of it. Even when green and steamed, cherry just doesn't bend very

photo by Phil Fischer



Cherry handrail and newel post



photos by the author

Portable book box



easily and tends to split without much effort. It does plane nicely, although you'd better be sure your blades are sharp and the planer's feed mechanism is in topnotch order. More than any other wood with the possible exception of white pine, I've found cherry prone to "planer burn." The nasty little burn marks in the wood are a nuisance to sand out. You can also get burn marks easily from dull table saw or jointer blades. Although the smell of burning cherry is very pleasant and fruity, you'll probably want to make sure all your machinery's edges have been recently sharpened.

Turning projects with cherry is a pleasure. The chips generally come off smoothly without raising the grain significantly. Cherry's close grain also permits very fine turnings such as goblets to remain quite sturdy. This, and cherry's finishing characteristics, are why cherry is so often used in making woodenware.

All conventional woodworking glues can be used when working cherry. Remember, of course, that if you're making woodenware, you'll need a non-toxic, waterproof glue. Some epoxies are appropriate, but check with the manufacturer first. Screws, nails, pegs and splines all work fine as mechanical fasteners in cherry.

Finishing

Cherry has one finishing characteristic that I think places it in a class by itself—polishing. This is a process of using increasingly fine sandpapers—up to 600 grit—to obtain a matte finish that has a sheen of about the same brightness as clear "antique" polyurethanes. But it's obtained by sanding alone—no finishes are necessary. For a finish on some-

thing that is unlikely to be accidentally stained during use, it's perfect. I've used it on cribbage boards, nameplates, music boxes, salt and pepper shakers, and so on. If you're still nervous about the finish, use a clear wax.

For more conventional projects, especially furniture, I've found polyurethanes give the best finish. Varnish and shellac are perfectly acceptable, too, but don't use shellac where water might spill. Non-toxic oils (such as mineral oil) are best on woodenware. I've never seen woodworking stains used on cherry. I suspect that most people are happy with the wood's natural colors and grain patterns.

Availability

Cherry is widely available in both boards and cabinet quality plywood. It is fairly easy to get boards twelve inches or more wide. Extra-thick boards are fairly easy to obtain, too. Prices run from as little as a dollar-fifty per board foot up to four dollars. One cautionary note, however: sometimes you may see "real cherry boards" advertised, usually at a farm that has decided to plow under its orchards. These trees make poor woodworking lumber. When trees grow in the open, wind, water and other stresses are quickly transferred to the wood. In turn, the lumber produced tends to crack, twist, warp and generally drive the woodworker nuts. I recommend staying away from such wood.

In general, however, you should have no trouble ordering cherry at any decent lumberyard. And once you've used it in a woodworking project, you may understand George Washington's fabled urge to cut it down. **PW**

Stored for a year in an unlit garage, the cherry in the center has darkened slightly. To the left is the same board after planing. Below is the planed board lightly oiled.

photos by Phil Fischer



Her One Mistake

For years I've been buying and collecting tools. I enjoy finding an old quality chisel or plane showing wear from years of use by its former owner, but still with plenty of life left to give. My wife doesn't quite appreciate such pleasures. "Do you really need that tool? Will you use it?" I've got to justify the cost, especially when she could use the money to buy a new dress or something for the house. She even complains about my subscription to *Popular Woodworking*—after all, why don't I just browse through all those back issues gathering dust?

It doesn't end there. I'm always hearing about her not being able to park the car in the garage "where it belongs" because of "all the tools." And the shop is a mess—why don't I sweep once in a while? So I stand there, trying to explain why I like sawdust underfoot. It makes me look busy

and feel busy, and it smells nice. And then there's the one about spending all my time in the garage instead of with her and the kids. Heck, I didn't even know we had kids, let alone four of them. And why don't I tune up the car, "it runs bad and you're a mechanic, so fix it!" Shoot, I work hard all week on customer's cars. I sure don't intend to waste valuable weekend time working on my own. "And what about the yard work?"

She says she hates my tools, my hobby and my magazines. Sometimes I feel guilty. I know my faults. God knows she reminds me enough. The pressure of just trying to be happy—it flat wears me out. I talked to Jerry, my beer drinking buddy and psychoanalyst. He says don't worry about it. It will pass. But I'm not so sure; after fourteen years, she hasn't even begun to let up.

Last October I saw an ad for a 24" Sears Craftsman Scroll Saw built in 1947 for only \$100. I was ecstatic! I answered the ad, but when I got off the phone, there she was, all ready for me. She snarled, baring her fangs and claws in the attack position, "Don't you have enough saws? You've got a table saw, radial arm saw, miter saw, band saw, circular saw, jigsaw, and every other kind of saw. Why do you need a scroll saw?"

Not knowing what to say, and not being able to get in a word edgewise, I took a deep breath. Then it came to me, "For the kids, honey!"

"For the kids?"

"Sure, I can make puzzles, games, all sorts of toys." It worked, and I got to buy the saw.

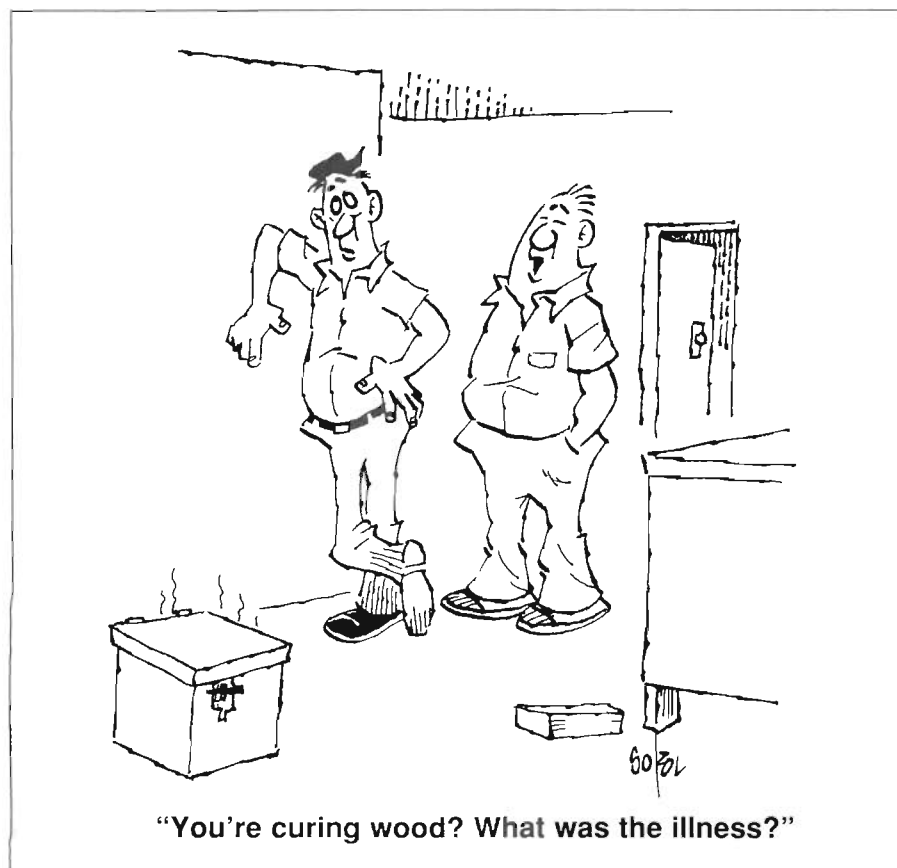
Shortly after I bought the scroll saw, it happened—her one mistake. I noticed my shop getting cleaner, bit by bit. Was it magic elves? I wondered about it while my valuable scrap supply dwindled and the piles of sawdust around the radial arm saw disappeared. Soon after, the floor around the drill press and the belt/disc sander got cleaner. I asked her, but she smiled and denied any knowledge of missing scraps or sawdust. Then I found a book of scroll saw patterns that I didn't know I had. I confronted her. She mumbled slyly that I'd had it "a long time, dear."

Then one day in December I came home an hour early from work, and heard a whirr in my shop. Walking through the door, I saw her standing at the scroll saw cutting out what I thought looked like Christmas tree ornaments. Sawdust covered her arms and clothes. After a minute or so, she spotted me, grabbed the shop vac and said, "Hi, honey, I was just cleaning up for you." The look on her face was priceless. I smiled a knowing smile.

"Yeah, sure, thanks Bernice, that's nice, cleaning my shop and stacking those scraps neatly," was all I could really say.

Now I have to share my tool catalogs, and worse, I can't get my hands on *Popular Woodworking* until she's done with it. Don't that beat all? Sheesh! **PW**

Ron Holladay is a woodworker and writer from Oxnard, California, specializing in mantel clocks.



Coming up in the November Issue of
Popular Woodworking:

Carved Wall Cabinet

Coopered Fruit Bowl

Scroll Sawn Animal Figures

Contemporary Spindle-Back Chair
and lots more...



Walter Morrison



Warren Asa



Deborah Porter



Warren Asa

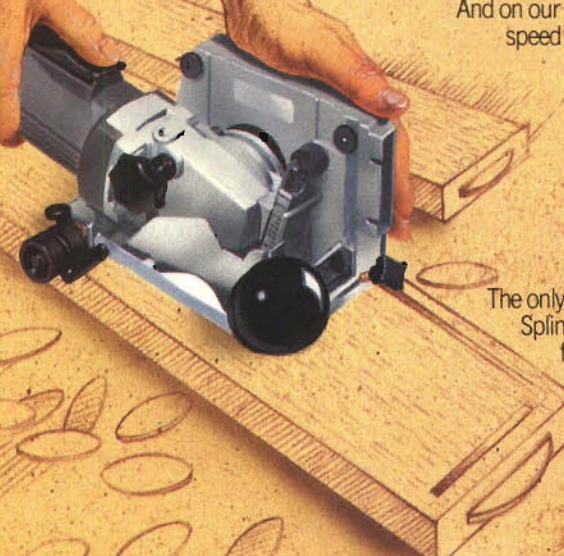
On sale in early October.



Ken Sadler



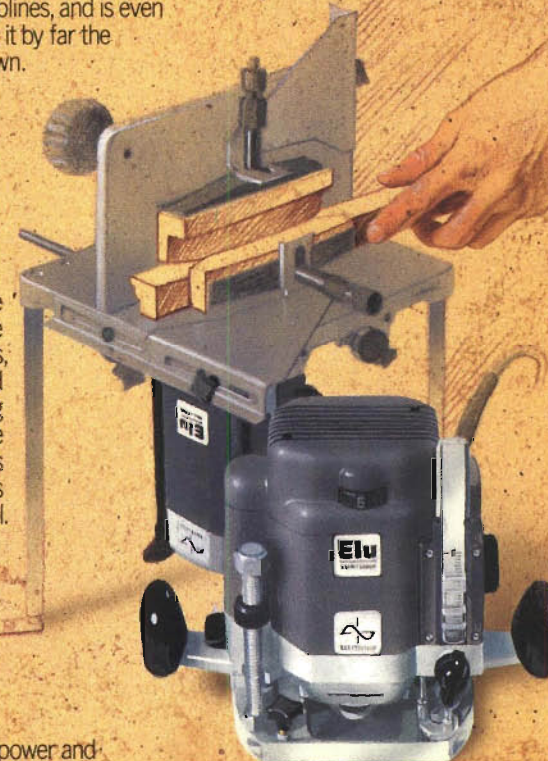
Elu Belt Sanders are designed to provide maximum precision. Each one is available with not only an attachable sanding frame to prevent gouging and rocking, but a compatible inversion stand or bevel fence for sanding from any position. And on our electronic model, variable speed selection gives you an even greater degree of control.



The only one of its kind in the U.S., the Elu Jointer/Spliner has a motor that swivels, so plate cutting from any position is easy. What's more, it makes grooves for flat dowels and splines, and is even a precision trim saw. Making it by far the most flexible tool you can own.



Solid and powerful, all Elu Plunge Routers provide perfect 90 degree entry and exit from the workpiece. Plus, on two models, electronic controlled variable speed is perfect for matching cutters to all different materials to assure the finest finish. And each Router is available with a variety of attachments to give you total versatility and control.



Our Universal Planer has the power and durability needed for a wide variety of materials. Its cast aluminum shoes are precision machined after assembly so they're parallel to the planing surface and rabbeting edge. And it gives you a satin-like finish every time.

The Elu System. A tradition of painstaking craftsmanship and modern technology combined to create the benchmark for woodworking accuracy.

Every tool we build has ball and roller bearing motors, heavy-duty housings and the latest power transmission systems. Plus innovative accessories that allow you to meet even the most grueling shop standards. With flawless performance every time. Raising woodworking to a whole new level of perfection. Elu™ From Black & Decker.®



Elu™
WOODWORKING TOOLS BY
BLACK & DECKER

ANYTHING LESS WON'T CUT IT.