Display until August 6

Popular Woodworking

Issue 55, July 1990

Plate Shelf • Bee Hive Jewelry Box • Sliding Miter Table • Child's Desk

Writing Table

Mailbox Post

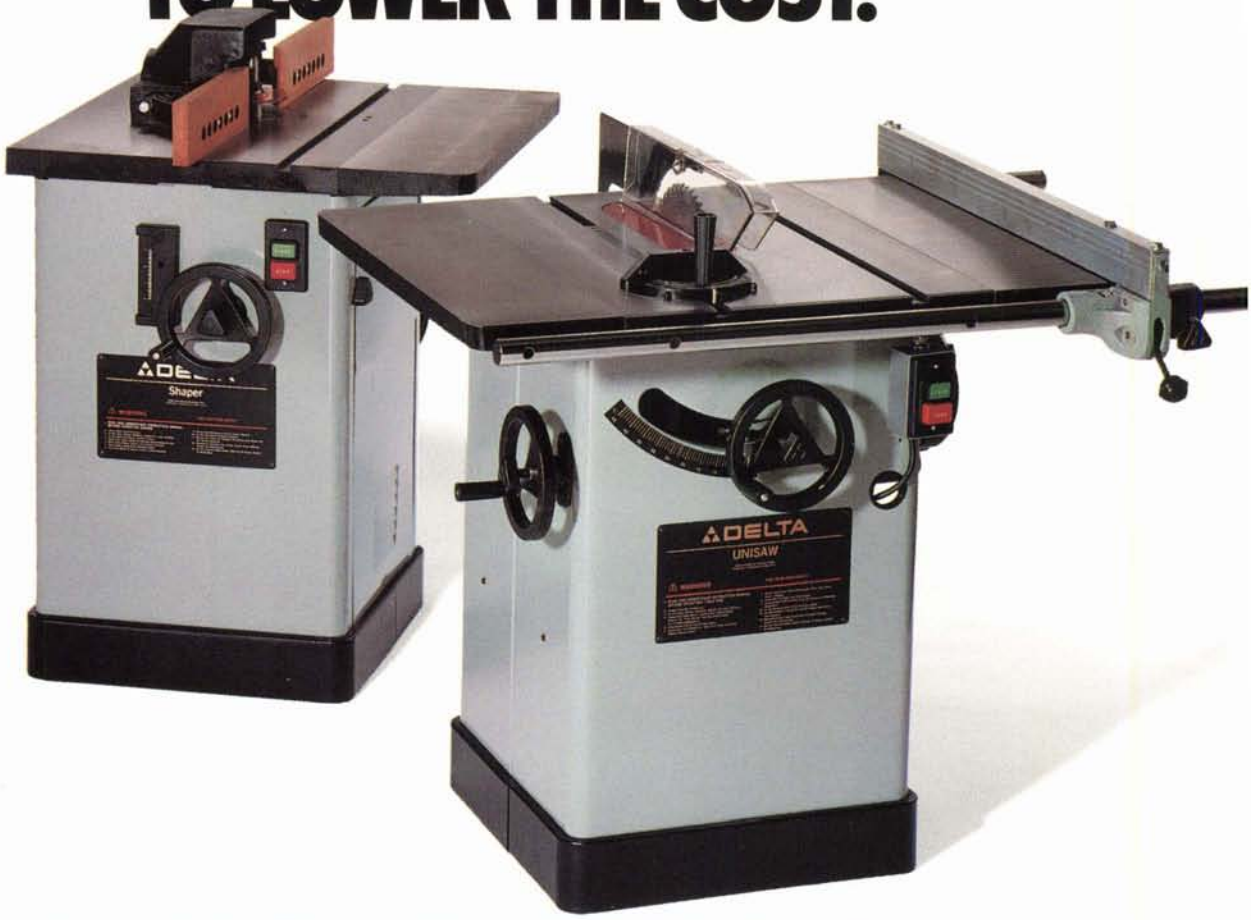
...and lots more!

A New Way to Deal With Dust

0 71486 01355 6 07

US $3.95
Canada $4.95

WE WON'T LOWER OUR STANDARDS TO LOWER THE COST.



BUT WE WILL STOOP TO A REBATE OR TWO.

Delta Quality. The standard of the industry. There's no compromising it. For *any* reason.

Take the Delta Unisaw® 10" tilting arbor saw for instance. It set the standard for general purpose table saws more than 50 years ago. Still the one you work your way up to.

And right now we're giving you a $150 rebate on any Unisaw to help you get there a little quicker.

Same goes for our Heavy Duty Wood Shaper. A hundred and fifty bucks back from Delta.

Both the Unisaw and the Shaper sport massive cast iron tables. Both have the power and precision to work in the big leagues. And both get you a check in the mail from Delta.

Your Unisaw comes with a 1½, 3 or 5 HP motor. Choose a model with a Jet Lock Micro Set® rip fence, or one equipped with a Unifence® saw guide for the ultimate sawing machine.

Your shaper comes with a 3 or 5 HP motor, and operates at 2 spindle speeds. It's ready to handle whatever comes through your shop.

Visit your participating Delta distributor and cut your best deal. Then Delta will cut you a check for an extra hundred and fifty.

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

Offer good only on purchases from participating distributors in the continental U.S., Alaska and Hawaii from April 1 thru July 31, 1990.

Building On Tradition

DELTA

A Pentair Company

SmartLevel®—

the new, electronic hand tool that accurately measures every angle, not just level and plumb

Your old bubble level is a thing of the past, because now you can own SmartLevel.® More than just a level, SmartLevel is a digital inclinometer that electronically measures *every angle* easily, reliably and accurately—*every time!*

With the push of a button, SmartLevel measures and displays:

- Level or Plumb
- Rise Over Foot of Run (Pitch)
- Degree of Slope
- Percent of Slope

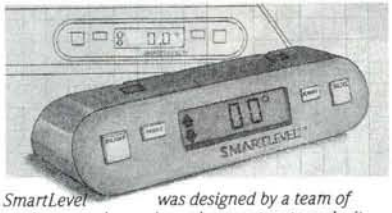
So you can quickly measure roof pitch; drainage, landscape or deck slopes; stairway rise; level and plumb. Plus, because SmartLevel displays *direct measurements,* you *don't have to do any other calculations* to figure pitch or slope.

SmartLevel helps reduce costly re-work

SmartLevel helps you avoid re-work because—unlike a bubble level—you can always be sure your SmartLevel measures true. Just press the "Reset" button and your SmartLevel is easily recalibrated to reliable accuracy.

Just press the Mode button to directly measure rise over run (pitch) Δ, degree of slope °, percent of slope %, or level and plumb with, if you prefer, a simulated bubble (: |||). Arrow shows direction to true level/plumb.

Plus, SmartLevel provides an exact digital display of the measurements you make, so there's no guessing. The display



SmartLevel was designed by a team of engineers and experienced carpenters to make it easy to use and to last a long time.

can be read from as far away as 10 feet, overhead or below-shoulder level, in bright or dim light. The display even "flips over" so you can still *read it when it's upside-down.*

Made of sturdy, high-quality materials for durability

The heart and brains of SmartLevel is a rugged, solid-state sensor sealed inside a weather-resistant polycarbonate module. You can use it alone as a torpedo level or lock it quickly into the hand-holds in our 2-, 4-, or 6-foot rails.

The hand-crafted rails are made of strong, aircraft-grade aluminum, through-bolted to solid teak centers that absorb shock and resist warping. The triangular shape provides a low center of gravity to make SmartLevel more stable than I-beam levels.

100% guaranteed

Every SmartLevel is backed by a 100% satisfaction guarantee. If for any reason you are not happy with your SmartLevel, you may return it within 30 days for a full refund. But we're sure you'll want to keep it—and it's backed by a one-year warranty against defects in materials and workmanship.

One sensor module will fit interchangeably into any of the 2-, 4-, & 6-ft. rails. The sensor module can also be used alone as a torpedo level.

So order yours today. Then you can stop second-guessing your old bubble level or replacing it year after year. Because you'll have SmartLevel—the most accurate, versatile and durable "carpenter's level" you'll ever own.

Order by mail, or phone toll-free 1-800-SMARTLEVEL

1-800 762-7853
Please mention Code F0PW
Mon.-Fri.: 7:30 AM-5 PM Pacific Time

WEDGE INNOVATIONS

In some areas, SmartLevel is available at select stores. Call Wedge Innovations for the name of the authorized SmartLevel dealer nearest you.

SmartLevel Order Form

Mail to: Wedge Innovations, 532 Mercury Dr., Sunnyvale, CA 94086

Description	Item #	Qty.	Price	Total
Sensor Module (fits in any rail)	SM		$89.95	
2 ft. Rail (without module)	TR2		$30.00	
4 ft. Rail (without module)	TR4		$60.00	
6 ft. Rail (without module)	TR6		$90.00	

Sub total: _____

Calif. residents add local sales tax: _____

Shipping (add $6.50 for each rail ordered; Alaska & Hawaii $10 per rail): _____*

Total: _____

Payment method: ☐ Check ☐ VISA ☐ MasterCard

Card #: _____ Exp. Date: _____

Authorized card signature _____

Ship to: (No P.O. boxes please.)
Name _____

Address _____

City/State/Zip _____

Daytime phone ( ) _____

*Mail orders, please allow 3 weeks for delivery. For faster service, credit card orders may be placed by phone. For overnight or second-day delivery service, call Wedge Innovations for delivery charge quote. Foreign orders please write, or FAX to 1-408-739-3353. F0PW

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 $25.70; 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.

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.

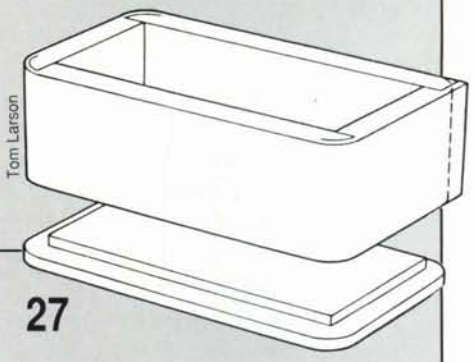
Contents

On the Cover

Tom Ocampo of Engel/Ocampo & Co. in Carmel Valley, California protects his lungs while belt sanding by wearing a Racal Airstream air helmet. This new type of respirator keeps sawdust out while providing the user with filtered fresh air. Alan Marks takes a look at seven air helmets on page 22 and explains why you should consider this new way of dealing with dust.


Alan Marks

Issue 55, July 1990 Volume 10, Number 1



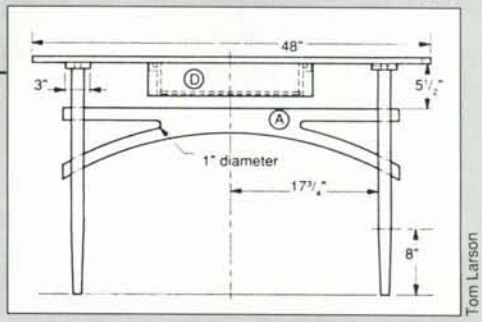
Tom Larson

27

Howard V. French

56

64



Tom Larson

Columns

Departments

Clear Cuts

Until recently, my shop at home has been pretty chaotic. We jumped right into remodeling our home before I really got the chance to set up a proper workspace. I had a little table with a vise attached and some pegboard tacked up behind it in a corner of the garage. I slapped up a quick shelf for some portable power tools, but most of my gear has been in well rummaged boxes. Lumber leaned precariously against any available wall.

Working in the shop was primarily a task of moving things around—getting them out of the way, getting to what I needed. Finding a tool was often a tougher job than doing the operation I needed the tool for.

I guess that's why, now that I have the time to put my shop together, I'm kind of obsessing on efficiency. I'm finding lots of clever ways to get the most use of the long narrow garage I've got to work with. It's one car wide by two cars long, and of course, it's got the laundry facilities in it. I decided to wall–off the last eight feet of the garage and make it a laundry room. I can't tell you how happy this has made My Beloved—having the washer and dryer away from my sawdust. I was just glad to be rid of two machines that couldn't in any way cut wood.

Lumber storage was my next big challenge. I didn't want wood leaning against a wall. Suspending it from the ceiling (the floor joists of the second story) was an option, but I didn't like the claustrophobic feeling of having heavy boards over my head all the time. Besides, it would preclude adequate lighting and still didn't address the storage of sheet stock. So I opened up a hole in the side wall that separates the garage from the crawl space and built a lumber rack under the house. By removing several studs and replacing them with a header rated to carry the load, I was able to make a three–foot high by six–foot wide opening that extends eighteen feet under the house. All of my wood is completely out of the way.

Now I'm working on tool storage. I want it so that whatever I need is within arm's reach or just a few footsteps away. I want my tools to be like prosthetic limbs connected to my brain. When I need to bore a hole, a drill materializes in my hand; the right bit is in a drawer only inches away from my other hand. To cut a piece to length, I take a few lateral steps and I'm at my radial arm saw. I pivot my torso and I can rip the piece to width on the table saw. It's not quite t*hat* efficient yet, but that's my dream, anyway.

I bought a used radial arm saw and set it up along one wall, with extension tables running most of the length of the wall. The saw is set a little bit higher than most because I need to be able to roll my other machines out of the way under the extension tables. This is essential, you see, because I've got to be able to store one more large piece of machinery—even though it, like the washing machine, can't be used to cut wood; I've still got to fit the car in.

David M. Camp

Letters

Popular Woodworking *welcomes 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.*

Plane Plans

I loved your article in Issue #52 (January 1990) about rebate planes ("Tried and True: Rebate Planes"); I found it very informative.

I would, however, like to see plans for building these wooden planes and other hand tools in future issues. This is the first of your magazine that I have read, and I'm impressed by what I've seen. Keep up the good work.

Kevin Hansen
Clayton, GA

Stay tuned, Kevin; we're working on plans for a wooden chamfer plane, and we hope to have more articles along those lines in the months to come. You might also want to order back issues #44 and #47 ($2.95 and $3.75 respectively, plus $2.00 postage and handling; send to PW Back Issues, 1320 Galaxy Way, Concord, CA 94520) where you'll find "Making Chisels and Gouges" by M. M. Lishinski (#44) and "Making a Marking Gauge" by Joe Petrovich (#47). Incidentally, Joe has just published a whole book along those lines, Custom Tools For Woodworkers: Designing and Making Your Own *(Stackpole Books, PO Box 1831, Harrisburg, PA 17105).*

Editor

Pricing Guidelines

I subscribe to *Popular Woodworking* and enjoy it very much—especially the PullOut™ Plans.

People have asked me to make the butterfly figures you had in Issue #52. I have made quite a few, but I have no idea what to charge for them.

What would be a fair price for a finished butterfly? Also would it be possible for you to give a suggested price for future plans?

Reino Luoma
Bovey, MN

Here's how to figure a fair price for the

butterflies (or anything else you make for that matter). You need to figure out how much each unit costs you in terms of materials and labor. Even if you're cutting out the wings from scraps of plywood laying around the shop, calculate how many you could get from a full sheet of plywood and divide the price of the plywood by that number. Do the same for the other materials you use including paint, glue, hardware, etc.

Next calculate how much time you spend making them. If you're doing a batch run, time yourself. You then have to decide how much your time is worth, and give yourself an hourly wage. Divide this number by the number of units you made, and add it to your cost per unit for materials.

If you were to make this into a business you should also factor in overhead and a profit (separate from your hourly wage). For more information on this subject refer to "The Business End: Pricing Your Work" in PW #45 (October 1988).

Editor

The Search is Over

I have just finished reading my first issue cover–to–cover. I expect to be one of your long–term subscribers in addition to ordering several back issues.

My reason for this letters concerns the article in Issue #53 (March 1990) by Ken Sadler ("Be an Artist in Wood: Design Your own Furniture"). The photograph on page 35 of Mr. Sadler's chair ends my search for "The Chair" for my dining room. Is there a set of plans available?

Ken Sadler is hard at work on articles about making many of the pieces shown in that article as well as designs for pieces that weren't included; see the writing desk project on page 64 of this issue, for example.

If you can hold out for a little while, we will be publishing plans and instructions for a simpler version of that chair (with a higher back and no arms) later this year, and then in the early part of next year, he'll share the procedures for that low back version with the armrests. The seat and leg construction for both chairs is the same, but he warns me that joining the armrests to the back rail is pretty tricky.

Editor

More Than a Great Review

Thanks for the great review of my video *How to Build a Solid Body Guitar*. I couldn't have said it better myself.

I enjoy your magazine, and the recent article by David Peck on "Photographing Your Work" (*PW*#53) was a big help to me in illustrating a book on guitar set–up and repair that I am writing.

Dan Erlewine, Technical Director
Stewart–MacDonald's
Guitar Shop Supply
Athens, OH

Don't Mess with Mesquite

Don Kinnaman's letter about substitute species ("Letters," *PW*#53) was fascinating until he got to honey mesquite. Since I operate a sawmill that cuts mesquite and I craft numerous items from mesquite, I am familiar with its characteristics and odor—which is pleasant. Apparently many others agree, since mesquite flavoring (liquid smoke, barbecue chips, etc.) is currently the fastest–growing portion of the food flavor market. Would 20 million Americans use outhouse flavoring on their food?

The only reasons I can think of that his wood stank are: he did not have honey mesquite, or his mesquite was contaminated after it was harvested.

As far as allergies are concerned, some people are allergic to mesquite dust. I am prone to allergies; however, green–cut mesquite does not bother me, even after it is kiln–dried. Dust from dead–and–down mesquite trees affects me, if I do not operate my dust–collection system. This may indicate that I am allergic to the residue of powder post beetles that attack dead–and–down mesquite, but then, who harvests dead–and–down timber. Cedar affects me even with the dust collection system and a dust mask. Would Mr. Kinnaman consider outlawing cedar?

Mr. Kinnaman implies that dust protection is only necessary with some woods. Any time fine dust (wood or otherwise) is stirred up, dust protection is required, since breathable particles (five microns or less) can be deposited in the lungs and cause damage. This has nothing to do with allergies.

Mesquite woodworkers and others interested in mesquite have banded together and formed an organization—Los Amigos del Mesquite (how many wood species have their own fan club?). We believe that while mesquite may not be the best thing since sliced bread, it is a close runner–up. Before putting mesquite down, try it.

Herb Nordmeyer
Knippa, TX

In response to Don Kinnaman's letter about harvesting trees from "your own backyard," I must state that his comments about mesquite are in error.

As a manufacturer of mesquite lumber, flooring and crafts, I am familiar with its properties. If, indeed, it was mesquite that he used, if it smelled like an outhouse, it must have come from a septic tank. Mesquite has a good smell, and its qualities of hardness, beauty of grain and color, ease of working and sanding outweigh most other hardwoods.

As further testimonial to its pleasant odor, it is most popular in fine restaurants throughout the country as wood for the grille.

I do agree that a good dust collection system should be used, as well as a dust mask when working with any wood.

Walter Wilson, President
Algaroba of Texas, Inc.
(Algaroba Means Mesquite)
Brady, TX

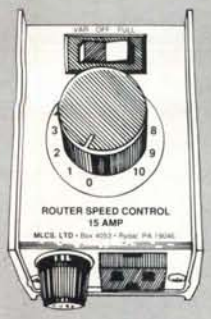
Mesquite is most beautiful (always two, three, or even four colors) and the grain is as independent as a pig on ice. It is very variegated, and as hard as oak.

Howard V. French
Abeline, TX

Correction

In the PullOut™ Plans for L. M. Kueck's "Cutlery Box" in *PW*#54 (May 1990) Part (B) was inadvertently drawn as being 5-3/4" wide. The dimensions given in the cutting list are correct; it should measure 5" wide.

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 3¼ 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		1¼" **Classical**	3/16" R	1¼"	5/8"	¼"	$22.50
#491		1½" Classical	¼" R	1½"	¾"	¼"	$25.00
#792		1½" Classical	¼" R	1½"	⅞"	½"	$25.00
#231		5/32" **Roman Ogee**	5/32" R	1¼"	15/32"	¼"	$17.00
#232		¼" Roman Ogee	¼" R	1½"	¾"	¼"	$18.00
#661		¼" Roman Ogee	¼" R	1½"	¾"	½"	$21.00
#340		⅛" **Cove**	⅛" R	5/8"	3/8"	¼"	$12.00
#341		¼" Cove	¼" R	1"	½"	¼"	$13.00
#342		3/8" Cove	3/8" R	1¼"	9/16"	¼"	$14.00
#343		½" Cove	½" R	1½"	5/8"	¼"	$15.00
#644		¾" Cove	¾" R	1⅞"	¾"	½"	$28.00
#350		1/16" **Round Over**	1/16" R	¾"	3/8"	¼"	$11.00
#351		3/16" Round Over	3/16" R	⅞"	½"	¼"	$11.00
#230		¼" Round Over	¼" R	1"	½"	¼"	$12.00
#353		5/16" Round Over	5/16" R	1⅛"	½"	¼"	$14.00
#354		3/8" Round Over	3/8" R	1¼"	5/8"	¼"	$15.50
#355		½" Round Over	½" R	1½"	¾"	¼"	$17.00
#656		¾" Round Over	¾" R	2"	⅞"	½"	$21.00
#370		3/8" **Rabbeting**	3/8" Deep	1¼"	½"	¼"	$14.00
#670		3/8" Rabbeting	3/8" Deep	1¼"	½"	½"	$14.00
#366		⅛" **Slot Cutter**	3/8" Deep	1¼"	⅛"	¼"	$14.00
#368		¼" Slot Cutter	3/8" Deep	1¼"	¼"	¼"	$14.00
#403		3/8" **Dovetail**	9 degree	3/8"	3/8"	¼"	$ 7.50
#405		½" Dovetail	14 degree	½"	½"	¼"	$ 8.50
#409		¾" Dovetail	14 degree	¾"	⅞"	¼"	$10.50
#709		¾" Dovetail	14 degree	¾"	⅞"	½"	$10.50
#402		3/8" Dovetail	8 degree For	3/8"	½"	¼"	$12.00
#404		½" Dovetail	8 degree Leigh	½"	13/16"	¼"	$12.00
#708		11/16" Dovetail	8 degree Jigs	11/16"	1"	½"	$14.00

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

ITEM NO.	BEST CUT BEST PRICE	DESCRIPTION	ANGLE/DEPTH/RADIUS CIRCLE DIAMETER	LARGE DIA.	CUTTING LENGTH	SHANK SIZE	PRICE
#415		¼" **Core Box**	round nose	¼"	¼"	¼"	$10.00
#416		3/8" Core Box	round nose	3/8"	3/8"	¼"	$11.00
#417		½" Core Box	round nose	½"	11/32"	¼"	$14.00
#418		¾" Core Box	round nose	¾"	5/8"	¼"	$15.00
#719		1" Core Box	round nose	1"	¾"	½"	$18.00
#470		¼" **Straight**	plunge cutting	¼"	¾"	¼"	$ 7.00
#471		5/16" Straight	plunge cutting	5/16"	1"	¼"	$ 7.00
#472		3/8" Straight	plunge cutting	3/8"	1"	¼"	$ 7.00
#473		7/16" Straight	plunge cutting	7/16"	1"	¼"	$ 7.00
#474		½" Straight	plunge cutting	½"	1"	¼"	$ 7.00
#775		½" Straight	plunge cutting	½"	2"	½"	$14.00
#478		5/8" Straight	plunge cutting	5/8"	1"	¼"	$ 8.00
#479		¾" Straight	plunge cutting	¾"	1"	¼"	$10.00
#781		1" Straight	plunge cutting	1"	1½"	½"	$12.00
#500		3/8" **Flush**	**Trimming**	3/8"	½"	¼"	$ 7.00
#502		½" Flush	Trimming	½"	½"	¼"	$ 7.50
#503		½" Flush	Trimming	½"	1"	¼"	$ 8.50
#804		½" Flush	Trimming	½"	13/16"	½"	$ 9.00
#545		**Tongue & Groove**	Straight	1 5/16"	1"	¼"	$29.00
#845		Tongue & Groove	Straight	1 5/16"	1"	½"	$29.00
#546		Tongue & Groove	Wedge	1 3/16"	1"	¼"	$29.00
#846		Tongue & Groove	Wedge	1 5/16"	1"	½"	$29.00
#450		1/16" **Beading**	1/16" R	¾"	3/8"	¼"	$11.00
#451		3/16" Beading	3/16" R	⅞"	½"	¼"	$11.00
#233		¼" Beading	¼" R	1"	½"	¼"	$13.00
#453		5/16" Beading	5/16" R	1⅛"	½"	¼"	$14.00
#454		3/8" Beading	3/8" R	1¼"	5/8"	¼"	$15.50
#455		½" Beading	½" R	1½"	¾"	¼"	$17.00
#375		**45 degree Chamfer**	45 degree	1½"	5/8"	¼"	$15.00
#676		45 degree Chamfer	45 degree	1⅞"	⅞"	½"	$23.00

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.

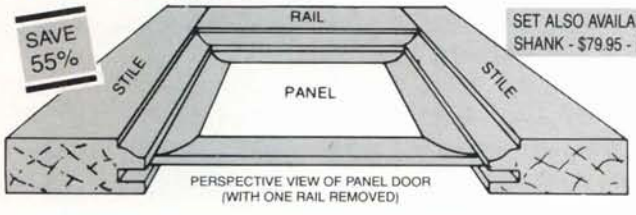
RAIL & STILE SHAPER CUTTER
Item #150 - **$49.95**

SALE PRICE **$69.95** FOR COMPLETE SET

Regular value Over $150.00

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

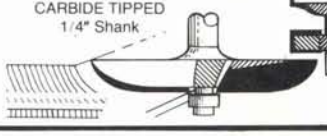
SAVE 55%



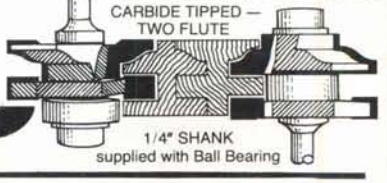
PERSPECTIVE VIEW OF PANEL DOOR (WITH ONE RAIL REMOVED)

SET ALSO AVAILABLE IN ½" SHANK - $79.95 - Item #852

RAISED PANEL BIT
SUPPLIED WITH BALL BEARING



REVERSIBLE COMBINATION RAIL and STILE BIT
(For making matching rails and stiles in raised panel doors, etc.) Works with stock from 11/16" 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 4053P, Rydal, PA 19046**

by Peter Good

Is Mail Order for You?

The idea of running your own business as a mail order operation is kind of like starting a new relationship—it sounds exciting, but risky, too. The unknowns and uncertainties, and the need to make changes in the way you do things are sure to make you dig in your heels in resistance. But don't get too defensive yet; after all, this is just a magazine article, and nobody's trying to push you into anything. The carrot in the notion of mail order is, of course, the possibility of vastly increasing your market. That in itself can be pretty scary when you stop and think about it.

Let's start by discussing all the possible reasons why mail order might be unsuited for a woodworking business. Let's take a worst case scenario. You're in the business of designing and building large, expensive handcarved tables out of temperamental woods that are easily damaged and don't take too well to temperature and humidity changes. These tables also have glass tops with intricate designs etched in them by sandblasting—which you pay someone else a healthy price to do. You'd be wiped out if one broke in shipment. Furthermore, every one of these tables is designed only after numerous meetings with the customer, and you feel that your physical presence is essential to the sales process. The thought of turning this into a mail order operation is out of the question. Or is it?

You reason that mail order isn't your cup of tea because you have to be there personally to promote and sell your product to every customer, you have to show samples of many materials, the wood you're using isn't suited to different climates and would do weird things if shipped, you have no idea who wants your tables outside the local area and you don't know how to find them, shipping is too risky and expensive, you won't be able to provide follow–up service, mail order promotion sounds like a lot of work, you don't have the time, it's too much trouble, and *the whole thing* sounds like a stupid idea!

Now for the rebuttals. You don't have to be there in person because a good brochure can sell your products for you. Samples of materials can be sent in a convenient form, even if they're just being loaned. You can choose woods that are more stable in varying climates, or you can acclimate the wood before construction by adjusting the moisture content to match the conditions of the piece's destination. You promote in new areas to the same kind of people you're reaching locally, and you find them by using demographic maps, charts, atlases, and selective mailing lists. Done properly, shipping is not risky, and if it's expensive, you pass the cost on to the customer. As for follow–up service, it can be eliminated, charged for, subcontracted, or you can teach the customer how to do all or part of it himself. Mail order is not a lot of work or trouble—it will probably take less time than local sales—and its potential profits can't be called stupid.

The main considerations in a mail order operation boil down to three: promotion, processing orders, and shipping. The rest is mostly imagined fears or just lack of knowledge. Let's take a closer look at these three areas.

Since people are essentially the same everywhere, promotion is really an extension of what you're doing now, provided you're using effective means to sell your work. A good commercial atlas can supply you with a wealth of information about people in other areas of the country, as can chambers of commerce, yellow page directories, local newspapers and magazines, and various demographic survey material commonly available in libraries. If you don't want to do the research yourself, you can buy selective mailing lists from direct mail companies or from businesses whose customers you're interested in. Many businesses even sell their mailing list in forms besides a printed list, including self–adhesive labels or computer data disks. You can generate your own list by advertising in the target area through newspapers, magazines, radio and TV, or even get free publicity by sending a press release to local publications. This is generally a short, factual article, typed double–spaced with wide margins, that reads like a news story. Press releases should have a headline, include quotes, and the text should start with a dateline (city and date). Put your name and phone number in the upper right corner.

Once you've determined who you're promoting to, you're next task is to create an appropriate letter, brochure or catalog which will do the actual selling for you. This publication will be your representative in the field, so it should be the best quality you can afford. Letters should be long, friendly, personal and in a conversational style. Brochures and catalogs should be well designed and illustrated; they should contain lots of information, enough so they won't be thrown away. If you use a letter, it should request some action by the reader, such as placing an order or sending for more information.

Order processing is a matter of being organized enough to efficiently handle the business that comes in. This aspect of mail order throws a lot of small businesses—they make a big promotional effort but are unprepared for the business that sometimes pours in. Delays in production and shipping, poor inventory control, and cash flow problems can result. Establish an orderly system for processing orders, being careful not to neglect any part of the operation. Handling orders promptly is of great importance because customers are out there wondering what's being done with the request they sent you. Orders must either be filled and sent or at least acknowledged immediately. Furthermore, if you do something as simple as thank customers for their order, they'll feel reassured and they'll keep coming back.

Shipping will take a little research on your part to determine what companies and methods are available in your area. The shipping method will depend on what you're shipping, but here's a few guidelines. Large items or large quantities of small items that are not too fragile or expensive can be sent by common carrier, that is, truck companies. Selection of a trucker will also depend on where you ship things. The last time I checked, only three companies—Yellow Freight, Pacific Intermountain Express, and Consolidated Freightways—would transport goods nationwide. The smaller, regional firms will take goods for nationwide shipment but will interline them—take them to the limit of their territory and then turn them over to

*As the owner of Grand Openings in Oakland, California, **Peter Good** manufactures doors. He also gives seminars at national woodworking shows on the business aspects of running a small shop.*

another company for further transport. Your shipment could get handled by as many as six different carriers by the time it arrives at its destination. Because of the occasional rough handling by common carriers, the goods must be packed or crated very well. Think twice before sending fragile or costly items this way because claims take notoriously long to settle.

For those items that require more careful handling, moving vans are a workable option, but an expensive one. If you're shipping small items, especially in small quantities, UPS is a good choice.

There are really no great mysteries about running a mail order business; it's just a matter of working out the procedure so that everything runs smoothly. The big advantage is that the size of your market increases far beyond your local area. Not everything, of course, is suited to sale by mail. On the other hand, companies are selling everything from houses and fine art to perishable meat and live tropical fish by mail, so why not woodworking? Think about it. PW

You Saw It On TV's "THIS OLD HOUSE"

LIFTS • PEELS • STRIPS AWAY UP TO 30 COATS OF PAINT AT A TIME!

- **NOW AVAILABLE IN COMMERCIAL PRE-MIX, simply apply—let set—and lift away paint in one single action.**
- **Ends sanding—scraping—spraying—chipping—steel wool virtually FOREVER!**
- **Amazing European discovery turns layers of paint into a single sheet, so it LIFTS AWAY INTACT!**
- **There are NO TOXIC FUMES and NO FLAMMABLE SOLVENTS!**

"PEEL-AWAY" WORKS WONDERS ON WINDOWS, WALLS, BRICKS AND FURNITURE*

You've seen it on TV's "THIS OLD HOUSE." You've read about it in newspapers and magazines. Now here it is, the amazing wonder formula that starts to penetrate old paint (shellac and varnish, too) IN JUST MINUTES! Transforms it into a soft, plastic-like film. Then simply let set . . . lift, roll, strip up to 30 coats of paint away in a single lift-away action! Years of built-up paint, lift away quick and easy.

"PEEL-AWAY" will also remove painted or unpainted wallpaper.

SIMPLY COAT IT ON—LET SET—SEE IT TURN PAINT TO "PAPER"—AND PEEL IT AWAY IN A SINGLE LIFT-OFF ACTION!

And now it's even easier than ever to apply, because easy to use, "PEEL-AWAY" comes in a NEW READY-MIX formula. Ready to use, just coat onto practically any painted surface, (except on factory baked finishes such as cars, washing machines, etc.) press down special "PEEL-AWAY" magic Liftex Strip away cloth . . . let formula set and adhere to surface and lift away old paint. It is as simple and easy as that!

SO ECONOMICAL TOO! REMOVES YEARS OF BUILT-UP PAINT . . . UP TO 30 LAYERS AT A TIME!

"PEEL-AWAY" is every home-owners dream come true. Ideal for indoors on walls, windows, furniture, etc.—Plus 101 outdoor uses too. And it's so economical too. Homeowner's size alone gives enough coverage to strip away as much as 50 to 80 feet of average wall and door trim, window frames, furniture molding, stair railing, patio furniture, edging, roof gutters . . . its uses are almost endless!

SAVES WORK! SAVES TIME! SAVES MONEY! MAKES TAKING OFF PAINT ALMOST AS EASY AS PUTTING IT ON!

So for the new low-cost, super-fast way to lift away old paint . . . lift away old varnish and shellac . . . order your "PEEL-AWAY" today on a full money-back guarantee. REMEMBER: You must be able to simply coat . . . peel . . . lift and strip away up to 30 layers of old paint in a single lift-away action . . . without sanding, scraping, chipping or steel wool . . . or purchase price refunded in full. Order Today!

**For hardwoods, PEEL-AWAY should only be used when surface is to be repainted. Do not use when you wish to reveal the natural color of the wood. Use PEEL-AWAY Hardwood #6, see coupon.*

PROVEN WORLD WIDE:

WASHINGTON MONUMENT, Baltimore, MD LIFTED AWAY **28 coats** of paint in a single application!

GREENWICH PALACE, London, England LIFTED AWAY **32 coats** of paint from ornate plaster ceilings!

CAPITOL BUILDING, Indianapolis, IN LIFTED AWAY **23 coats** of paint in a single application!

BRITISH MUSEUM, London, England LIFTED AWAY **100 years** of paint from the museum's iron railings, in a single application!

PLUS . . .

Texas A&M University, The American Hotel in Amsterdam, Holland, Royal Hospital, Chelsea, England, and other landmarks across the nation, and worldwide!

The Pros no longer chip, scrape, spray, or sand . . . why should you?

MAIL NO RISK COUPON TODAY

DUMOND CHEMICALS, Dept. PHW-18 **1501 Broadway, NY, NY 10036**

Please RUSH the quantity of "PEEL-AWAY" (in commercial pre-mixed formula) checked below. If I am not completely satisfied, I may return for a full refund (less postage and handling, of course).

- ☐ Regular Size (½ Gallon) **only $14.95** plus $3 postage and handling.
- ☐ Homeowner Size (1 Gallon) **only $21.90** plus $5 postage and handling. **YOU SAVE $9.00!**
- ☐ Handyman's Super 5 Gallon Size **only $79.50** plus $15 postage and handling. **YOU SAVE $80.00!**
- ☐ PEEL-AWAY Hardwood #6 (For hardwoods not to be painted after stripping). 1 Gallon **only $49.95** plus $5 postage and handling.
- ☐ **SPECIAL PEEL-AWAY** Hardwood #6 2 Gallons **only $89.90** plus $10 postage and handling. **YOU SAVE $10.00!**

Amt. Enc. $_____ (NY res. add sales tax). No C.O.D.'s.

Name _____

Address _____

City _____ State _____ Zip _____

Book Reviews

by Hugh Foster

Here are three books that are important for vastly different reasons. The first is important as the most thorough discussion a major shop machine tool has ever received. The second tells us how to buy second–hand tools intelligently and condition them for use. And the third is a book of great beauty. As you'll see, each will make a useful addition to your woodworking library.

Band Saw Handbook by Mark Duginske, (©1989 Sterling Publishing Company, 387 Park Avenue South, New York, NY 10016-8810), 319 pages, paperback, $16.95.

With a little adjustment, almost any band saw can be made to perform more sawing operations more accurately and more safely than almost any other tool. Many authors and teachers have told us that the saw needs adjustment, but until now none of them ever told us *how* to make the adjustment. Apparently it was just some ineffable skill that we were supposed to pick up when we needed it—perhaps by osmosis. Finally someone has given us a plain–English guide to "tuning up" the band saw.

Cataloging the book would hardly begin to do it justice. Indeed, such a catalog might scare away those woodworkers who don't care to know their subject in depth. Depth is what we get lots of in this book. Duginske really teaches us the basics of the generic band saw. He fills nearly 180 well–illustrated pages before even making a cut! People who want to saw owe it to themselves to follow the instructions here, for the result will be a saw so well prepared for use, that errors will be fewer and farther between.

While the excellent table of contents permits us to browse in the book rather than read it carefully and consecutively, browsers are sure to wonder why the "tricks" they discover later in the book don't work as well as they appear to work in the book's illustrations. The explanation is simple enough: by skipping the earlier chapters they're trying to do the tricks on a saw that hasn't yet been properly prepared for use.

The chapters about blades and set–ups have been made exceptionally interesting by this master teacher. He helps refine our ideas about what is precision, and how close is "close enough."

While for me the chapters about set–up were the highlight of the book, those who insist on a different kind of practicality will enjoy the last hundred pages or so immensely. In them, Duginske deals with basic cutting techniques, patterns and templates, cutting curves and circles, cutting straight work, advanced techniques, and even some projects. I hope the project section is but a foreshadowing of a *Band Saw Projects* book. Normally, 15-20 pages of projects seems gratuitous, but the projects here are genuinely practical, for they help us develop skills that will be useful in more advanced projects of our own design.

If you don't yet have a band saw in your shop, *Band Saw Handbook* may help you decide which model to buy. Duginske tells which features and specifications are desirable, and he goes on to explain how to tell whether a machine is well made. Then, going one step farther, he tells how to make the best possible saw out of whatever saw you have been able to afford. Apparently one of the main differences between the best band saws and their inferiors is that excellent saws are more powerful and more readily adjustable to the "perfection" the individual band sawyer seeks.

This book will do more than just about any other I know of to help woodworkers at all skill levels increase the accuracy of their work. In short, don't look for a copy of this at the public library; buy it! Even after you've tuned your saw, you'll refer to it time and again. My copy may not stay in the shop forever, but that's where it's going to spend the next several months—now that it's been carefully read, it will serve me nicely there as a reference tool.

Restoring, Tuning & Using Classic Woodworking Tools by Michael Dunbar, (©1990, Sterling Publishing Company, 387 Park Avenue South, New York, NY 10016-8810) 256 pages, paperback, $14.95.

As tools become ever more expensive, we woodworkers have an ever increasing need for this sort of book. Dunbar tells us in the introduction that "classic" is used here to mean "second hand," "pre–owned," or "used." What he hopes to tell us is how to select pre–owned tools and how to prepare them for use.

One of the first issues raised is why buy "classic" tools? Older tools are almost always less expensive, and they're usually more carefully and thoughtfully made from better materials. Side–by–side photos of tools from the early and recent 1900's show subtle differences in design that must surely affect ease of use. In some ways, it almost appears that the goal of most modern hand tool makers is to make us want to buy power tools, despite the fact that many of us enjoy traditional, muscle–powered woodworking.

It is a practical book, carefully written for woodworkers. Dunbar explains that if we are buying the tools for use rather than for their "collectability," we need to be sure that we get all the tool's parts, and that none of them are damaged beyond repair.

After buying the tools, you still have to prepare them for use. This is just as true of new tools, which are often packed in rust–proofing gel and just as out–of–square as their "classic" counterparts. The most useful section of the book treats cleaning and refinishing tools, heat treating techniques, the lapping table, and sharpening techniques. Tips from this section will change the way we store our tools; for example: "I store my planes on a shelf under my bench. I have tacked a thin strip of wood along the back of the shelf and set the toe of the plane on this strip. This raises the cutting edge off the shelf." Nothing profound, you might say, but it is the sort of "nugget" that can improve the way you run your shop.

Subsequent chapters treat bench planes, specialized planes, plane–related tools, chisels and gouges, saws and braces and bits. A pair of excellent appendices list tools for various kinds of workshops and a bibliography for those who want to study the issue in greater depth.

A friend of mine's work is as hand–tool dominated as mine is machine–tool dominated. He's sure to find this the most important woodworking book of the year. While it won't be that for us machine–tool woodworkers, it presents us with far more than a historical perspective on our craft. There are reasons for doing many of the operations described in this book by hand. In short, it deserves your serious attention.

Marquetry: An International Craft Classic by Pierre Ramond, (©1989, The Taunton Press, 63 South Main Street, Newtown, CT 06470), 237 oversize pages, hardcover, $59.95.

When I originally thought of marquetry, what came to mind were the simple

Hugh Foster *is an English-teaching woodworker in Manitowoc, Wisconsin.*

"country–style" plaques—pictures more representational than graphic—that I had seen always overpriced at craft fairs. I was unprepared for marquetry projects like the ones detailed in this fine, expensive volume from the Taunton Press.

The text and illustrations demonstrate that competent marquetry is far more than an exercise in taste and manual dexterity. Marquetry, like the making of this book, has to be a labor of love. Translated from the French by Jacqueline Derenne, Claire Emili, and Brian Considine, the English is never less than idiomatic; were we not told the book is a translation, we'd not know.

Chapter 1 presents the history of marquetry, which began in Roman times as intarsia. By the fifteenth century, wood began to be tinted with penetrating colors boiled in water; soon after, acids and burning were used to add shadows. Words alone can't do justice to this chapter filled with color and black and white photos of work from the periods being discussed. Pages 22-23 show an inlaid floor that was restored in the 1970's—an illustration that this ancient craft is still alive. The first nearly seventy pages are far more an art book than a craft book—if you look at only these pages, you'll understand the book's cost.

Chapter 2 is a short but valuable one for the craftsperson, for it describes a modern marquetry shop. Chapter 3 treats the manufacture of veneer and other marquetry materials: mother–of–pearl, tortoise shell, horn, metals, and, in modern times, plastics. Chapter 4 discusses the tools with which the work is done. These short chapters lead into the real business of the craft section of the book—what to do. The first sentence of chapter 5 reminds us that "The tracing of the drawings and the variety of veneers are the basis of the execution of the marquetry." A non–drawer like myself has little hope of accomplishing advanced marquetry effectively. Yet much marquetry work seems to be in repair of old work, so the drawings can be traced from the originals.

Chapter 6 discusses the preparation of the veneers for cutting. Delicate veneers are often prepared for cutting by gluing newsprint on both sides with glue that has been cooked in a double boiler for about twelve hours! If the wood has been properly prepared, sometimes a dozen or more identical pieces can be cut at once. Chapter 7 discusses the five principal methods of marquetry cutting. This information is presented in condensed but understandable format.

Chapter 8 treats geometric treatment of veneer application, "frisage" and "jeux de fond"—these are the patterns such as "herringbone" that sometimes are the work itself and other times merely the background for the work. Seeing the hundreds of pieces of a herringbone before they are glued up and imagining the patience such an assembly must take is almost mind–boggling.

Chapter 9 tells us about the construction of the cutting tools. Knowing how they work is frequently enough to tell us how to repair them when they stop working perfectly.

For this reader these useful chapters pale by comparison to the art book presented in the first chapter. This book pays great tribute to this little understood aspect of the woodworker's art. While the book's cost will doubtless limit its audience, I hope it is sufficiently popular that the Taunton Press won't hesitate to give us another such volume when the potential arises.

Each of these volumes merits your consideration. The last for its considerable beauty, the first two for their technical expertise. At least one of them is sure to deserve a permanent place in your woodworking library. PW

Flooring

#2 Oak 2-1/4 Strip $.75 BF
15 Species available in Strip or Plank
Harmony Exchange
(704) 264-2314
Materials for Log & Timber const.

INVERTED PIN ROUTER

Duplicate intricate parts precisely with router speed
- plans
- kits
- finished tool

brochure $1.00

WOODCRAFT MFG.
Box 399, Ephrata, WA 98823

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

TRUE VALUE &TRUE QUALITY

JOINTER
12" planing width 13-3/4 x 72" precision ground cast iron table3HP motor. JT-0012...**$1895**

INDUSTRIAL PLANER
7 5/6" max thickness, 1/4" max cut, 3 knives, return roller,mag. switch.
3 HP, 20" max width
WP-1120...**$1990**
5 HP, 24" max width
WP-1124...**$2790**

TILTING ARBOR TABLE SAW
Cast aluminum guide rail. Quick lock fence.
3HP Motor 2Belt drive
HTS0012A.....**$859**
3HP Motor 3Belt drive
TS-1010.....**$1295**

DUST COLLECTOR
1HP Motor
UFO-90.....**$199**
2HP Motor
UFO-101....**$345**
3HP Motor
UFO-102B..**$495**

WIDE BELT SANDER
3 precision bal. contact drums. Full pow. drive sanding & auto infeed. Computerized adj.table.
24" working width
A-2548....**$6450**
36" working width
A-3760....**$9790**

STROKE BELT SANDER
60"x 21-1/4 sliding table,6"sanding belt width, 2HP SK-1500BS....**$1590**
80"x 21-1/4 sliding table,6"sanding belt width, 3 HP SK-2100BS....**$1890**

DRUM SANDER
Double drums.Dust chute.1/4 HP feeding
15" 3 HP
SK-15DS...**$1995**
20" 3 HP
SK-20DS...**$2225**
25" 5 HP
SK-25DS...**$2550**

SPINDLE SHAPER
1" and 3/4" Spindle 3HP
28"x30" table F/R Switch
SK-30SPA..**$849**
SLIDING TABLE
SK-35ST....**$239**

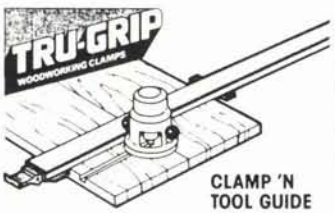
18" BAND SAW 2HP, MBS-018.....**$959**

Clayton Oscillating Spindle Sanders.

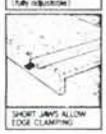
For large or small shops. Ideal for contour sanding. Quick change drums. ½" to 4". Satisfaction guaranteed. Covered by 1 yr. warrantee. 4 models to choose from. For more information write:

Clayton Enterprises
2505 W. Dewey Rd.
Owosso, MI 48867

Made In U.S.A.



CLAMP 'N TOOL GUIDE



ALL-IN-ONE...
- Bar Clamp
- Straight Edge
- Fence
- 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 ½" 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.....$22.95
50" Grip (panel size).....$32.95

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

Building our name...building your dreams. Providing high quality woodworking tools including...
- JOINTERS
- LATHES
- MORTISERS
- PLANERS
- SANDERS
- SAWS & more!

Featuring:

EDGE SANDER
6"x 132" belt, 45° table tilt, 12"x60" table
EGS-132.....**$990**

NEW VIDEO CATALOG $10
Refunded with ($500) order

LOBO POWER TOOLS

Dept 9876, 9034 Bermudez Street
Pico Rivera CA. 90660
(213) 949-3747

All F.O.B. Pico Rivera,CA

Write or call now for
FREE BROCHURE
or $3 **Catalog** ($5 refunded with order)
One year free parts warranty

by Graham Blackburn

Carving Tools

Figure 1 Square Carving Chisel, No. 1

Unless you buy them from a specialty tool catalog, today's woodworking chisels tend to be pretty much all the same design. True, the better quality ones are fitted with high–impact plastic handles while cheap foreign imports still use wood, but the design of the blade is almost always a kind of all–purpose, bevel–edged firmer chisel. If you don't have a small fortune to spend on specialized tools, you're forced to make one design do for all manner of specialized jobs. The same stubby tool must chop mortises, remove substantial amounts of wood, delicately pare finished surfaces, reach into tight corners, and scribe joints. Predictably, the results are unsatisfying, and the amateur assumes it's his skill that's lacking, not realizing that having the proper tool for the job is half the battle.

An Endless Variety

On the surface, it might seem that a chisel is a chisel is a chisel. The definition is, after all, very simple and applicable to all forms of the tool: a length of metal with a transverse cutting edge—as opposed to a knife which has a longitudinal cutting edge. You may be well aware that carving chisels and bench chisels are two different animals, but unless you're an experienced carver you may not realize how immense is the range of those tools loosely categorized as carving chisels. Over the millennia this tool has evolved into more varieties than any other single class of tools.

Non–carving woodworkers, having learned the difference between chisels and gouges, are often surprised to discover that carvers refer to all their cutting tools as chisels regardless of their shape. Those which qualify as chisels by the carpenter's definition are, in fact, the smallest class; most carving tools appear to be varieties of gouges. But such is not carver's usage and, broadly speaking, he is justified—they all have a transverse cutting edge.

Nowadays, carving tools are commonly referred to by number, although in years past many curious names were used. The numbers now commonly used come from the famous Sheffield Illustrated List, a nineteenth century trade catalog published regularly from the 1860's on. They're actually the last two digits of the List's "article number," and were so well worked out that the system proved invaluable and has been almost universally adopted. All tools of the same shape (though not necessarily the same size) share the same number, so that all you need to identify any carving tool is this number preceded by a measurement. Nevertheless, the range of types is so great that broad groups may still be clas-

Graham Blackburn *is a furniture designer/maker in Rio del Mar, California and author of many books on woodworking and home maintenance including* Floors, Walls and Ceilings.

illustrations by the author

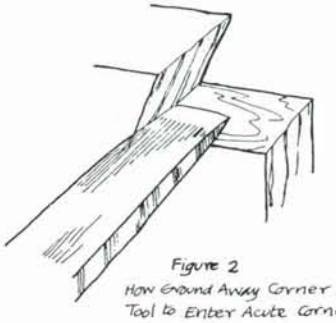


Figure 2
How Ground Away Corner allows Tool to Enter Acute Corner

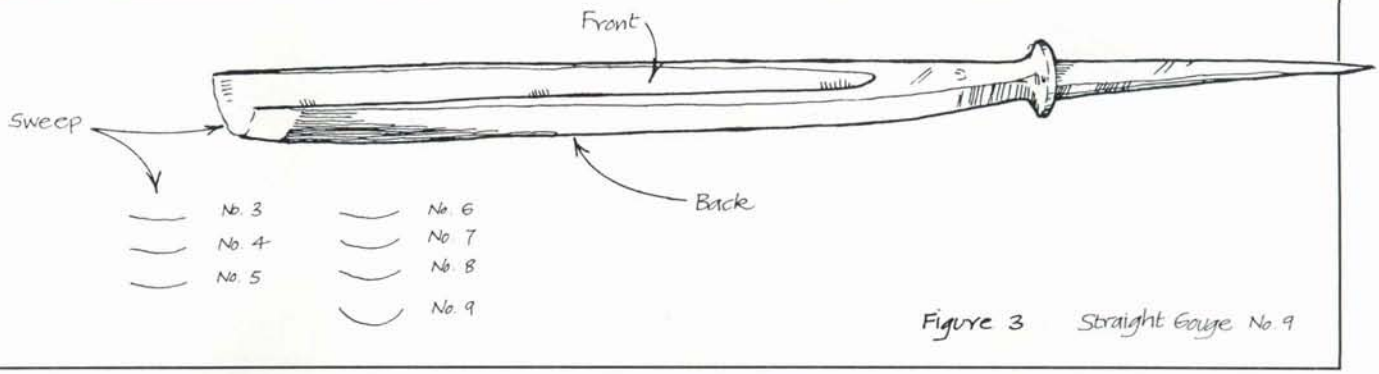


Figure 3 Straight Gouge No. 9

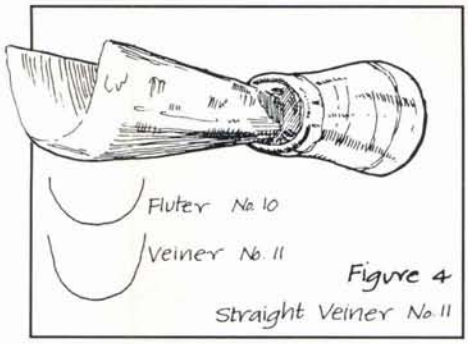


Figure 4
Straight Veiner No. 11

sified according to family names which aren't always self–explanatory. Without the Sheffield List, the confusion in trying to refer to a particular carving tool would be enormous, even though far fewer types are available today than in the past.

According to contemporary reports, descriptions and inventories, medieval woodcarvers had many more types at their disposal than we even know of today—their complete kit consisting of as many as three thousand tools. Considering the amount of carving that covered almost every available surface, especially in the great cathedrals and private houses, this is understandable, though understanding how much of it was accomplished still stretches the imagination. Much of the undercutting, high relief, and apparently tortuous virtuosity would tax today's most highly trained and skilled carvers.

We no longer use all four digits (the first two were 37—for every carving tool) and the Sheffield List is long since defunct, but it's general classification of forty–six different combinations of cross–sections and longitudinal shapes has survived intact. Remembering that each of these forty–six shapes was offered in a range of twelve or more sizes, it's obvious that some sort of scheme for cataloging over five hundred tools was necessary. The list proceeds in numerical order from (37)01 to (37)38, grouping tools according to their longitudinal shape. This may be straight, gently curved, or tightly curved frontwards or backwards. The exception is the parting tool, whose longitudinal varieties are grouped together from (37)39 to (37)46.

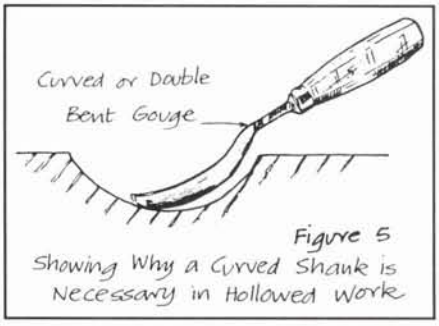


Figure 5
Showing Why a Curved Shank is Necessary in Hollowed Work

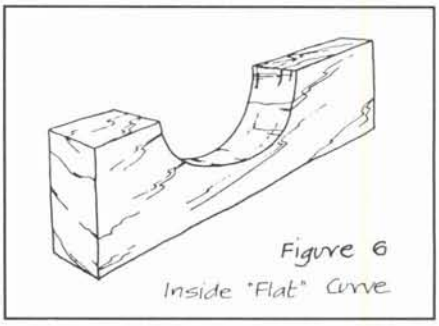


Figure 6
Inside "Flat" Curve

Straights

The first group (1 through 11) are those chisels and other tools with perfectly straight shanks. Carving chisels differ interestingly from bench chisels. They're considerably lighter and are invariably made with a tang and a small bolster (Figure 1); most important, they're sharpened on both side of the blade. Furthermore, unlike a properly sharpened bench chisel with its (ideally) flat bevel, the bevel of the carving chisel may be slightly rounded over and even have one corner ground away to allow easier access in tight corners (Figure 2). Number 1 refers to square chisels, made in a range of sizes from 1/32" to 1" or larger, *and number 2* refers to corner chisels, which come in a similar range of sizes. Since they're given bevels on both sides of their blades, either side can be considered front or back. Consequently a number 2 can be either a left corner or a right corner chisel depending on how you hold it.

You can't mistake the front or back of gouges, however. The concave side is the front whether the tool is sharpened with an inside or an outside bevel. In practice, most gouges—especially when carving hardwoods—are sharpened on both sides, usually with a larger bevel on the outside, although the smaller bevel tends to disappear if the tool is used primarily for carving softwood. Numbers 3 through 9 are gouges proper, each number designating a tighter curve known as the tool's sweep (Figure 3). The sweep is actually part of a circle; the tighter the sweep, the more of a circle's circumference is described by the tool's edge. Thus a number 3 (straight

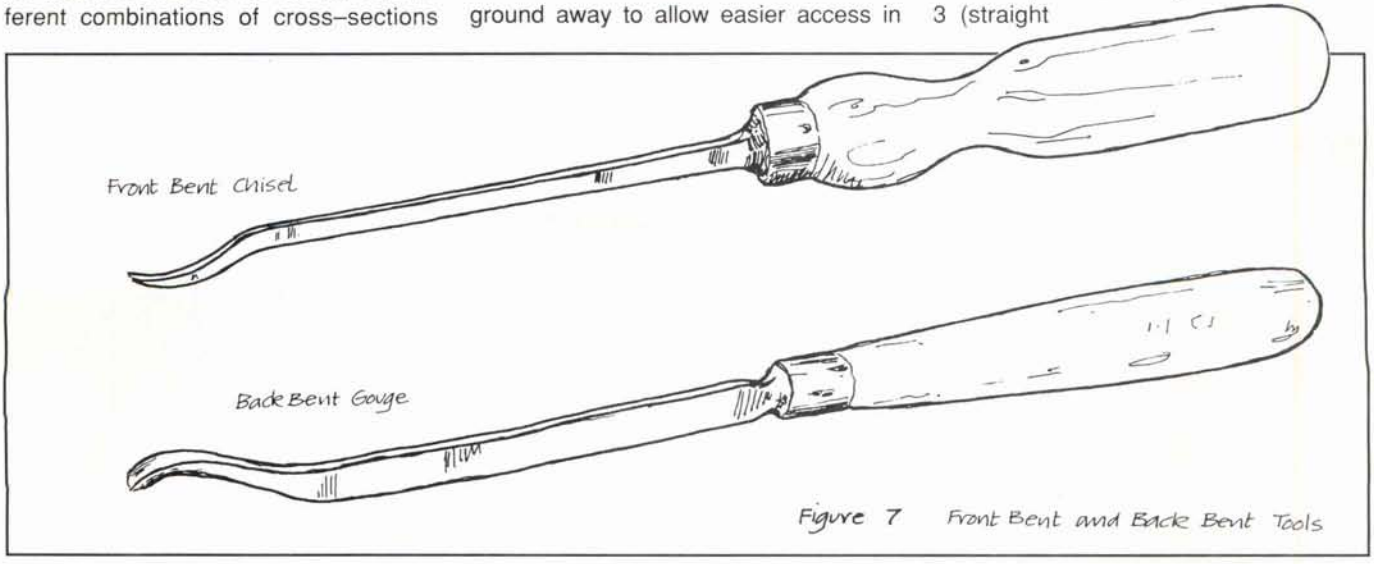


Figure 7 Front Bent and Back Bent Tools

gouge) describes a very flat arc, and would need to repeat its cut many times to form a complete circle, while the higher numbers describe increasingly greater circular sections so that a 9 describes an entire semi–circle. As with the two chisels, each of these sweeps comes in a wide range of sizes so that it's possible to find a gouge that will match almost any size segment of any diameter circle.

The last two numbers used for straight–shanked tools describe gouges known specifically as fluters and veiners. They're very similar to gouges and can easily be mistaken as such, but close examination reveals that their cross–section is more U–shaped than circular. A veiner's sides are distinctly straight and form a channel–like section (Figure 4).

Curved Gouges

As Figure 5 makes clear, a tool with a longitudinal curve (a curved shank) is necessary in hollowed work. Curved chisels are known but are rare and not included on the list. In general, when curved work calls for a flat section (such as the inside of the shape in Figure 6), a number 12 gouge will be adequate. As with straights, 12 through 20 represent tools with increasingly tight sweeps, 19 and 20 being curved fluters and veiners. Should any of these tools be ground other than straight across, they are known as skew or corner tools; this modification is typically done by the user and does not change the tool's number or definition.

Front Bent and Back Bent Tools

In sharper distinction to front bent and back bent tools, the curved gouges mentioned above are sometimes known as double bent tools. This is not to imply that they are bent twice (in two directions), but that their bent section is twice as long as that of tools bent only at the end of their shanks (Figure 7). The first three members of the front bent group, 21 through 23, are all chisels—straight, right corner and left corner—and are often called entering chisels. Numbers 24 through 32, comprise the front bent gouges, fluters and veiners, which are often called spoon bit gouges by virtue of the shorter length of the curved cross–section of the blade. These tools are more commonly used than the back bent varieties and are espe-

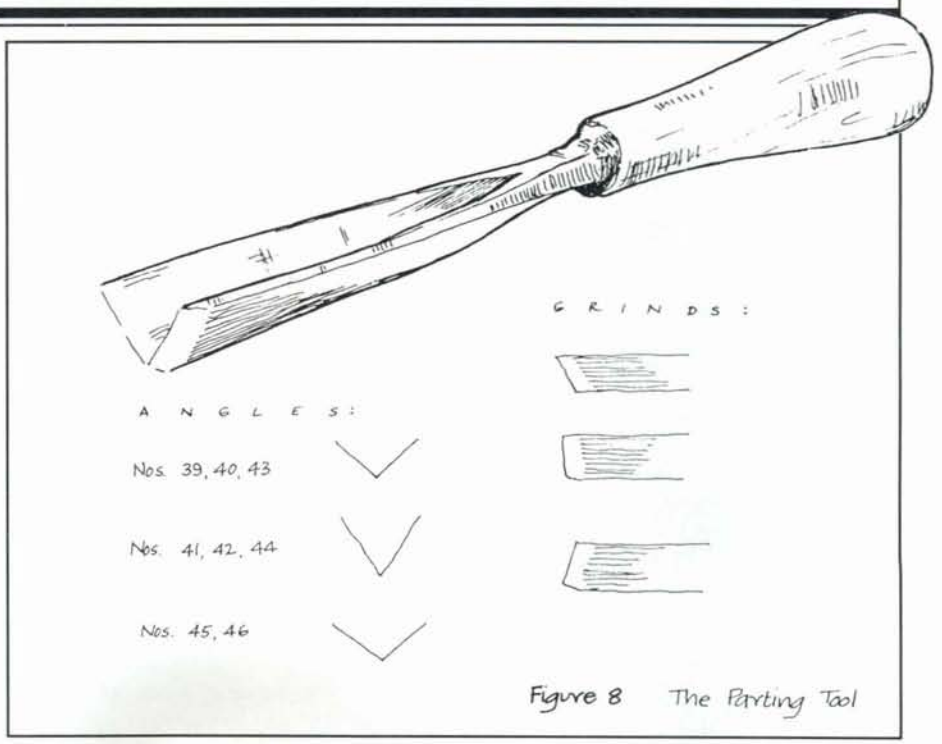


Figure 8 The Parting Tool

illustrations by the author

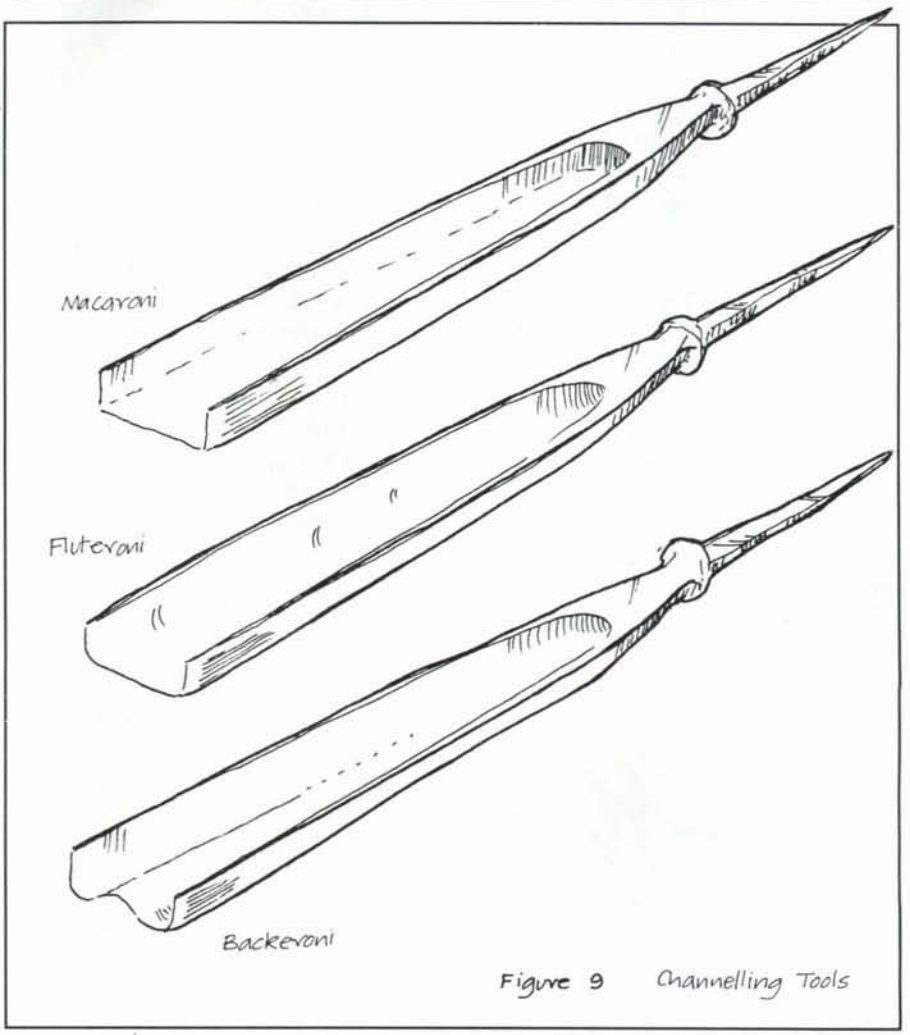


Figure 9 Channelling Tools

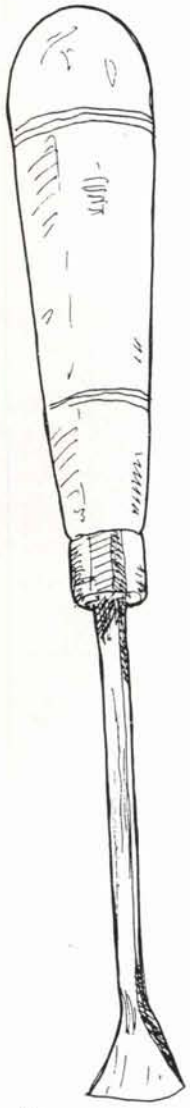


Figure 10
Front Bent Fishtail Gouge

cially useful for cutting hollows in rounded shapes.

Tools 31 through 38 are bent the other way from front bent tools, and are known as back bent (or spoon bit) gouges. Back bent (entering) chisels are as redundant as left and right corner straight chisels for the same reason—since their blades are bevelled on both sides, all that's needed to obtain the alternate tool is to reverse the way it's held.

Parting Tools and Beyond

The last numbered group includes tools with varying longitudinal shapes but all sharing a V–shaped cross–section. The angle formed by the V may be 40°, 45° or 90°, and although most start out with a vertical grind, this angle is often changed to suit the carver's needs, as shown in Figure 8.

There are several types of tool in common use, and untold numbers existing as survivors from an earlier time or as custom–made examples, that aren't included in the Sheffield List. Three stand out as unusual—the macaroni, the fluteroni, and the backeroni (Figure 9). These tools were developed mainly for finishing the sides of recesses—such as the channels between carved leafage—and exist in both straight and curved versions.

Fishtail tools comprise another popular group. The reason for the name is obvious (see Figure 10). They're very useful for finish lettering. Dog leg tools, similar to Japanese (and patternmakers') cranked chisels, are also used for finishing work, especially recessed sections (Figure 11). For really hard to reach areas, there's even a side chisel (Figure 12). The last main group are the allongees (Figure 12). This curious word loses much of its mystery when you discover it's simply French for elongated. Used mainly by sculptors for efficient removal of large amounts of material, allongee chisels and gouges can also find a useful place in the carver's kit.

A Kit to Start With

Don't think that all the tools described here are indispensable! Of the five hundred to a thousand different tools that might be collected today, perhaps sixty or seventy might comprise a very professional kit, and only twenty to thirty are sufficient for a great deal of quality work. The guiding principal in building a set of carving tools should be to obtain only what you need as you need it.

Such advice may be hard to follow in a culture that values having "sets" of things. But in truth there is no definitive set of carving tools. In fact, starting out with such a set can be a serious disadvantage since it's likely to be made up of tools all made by the same manufacturer and sold with identically matching handles. When you work with many tools spread out before you, being able to recognize quickly the tool you want is a great help, and this is best accomplished when every tool has a unique handle made with a different wood, color, or shape.

Handles vary considerably from very plain to elaborately turned (Figure 13). Octagonal or hexagonal handles, hand cut with draw knife or spokeshave and with a graceful curve to them, have been used for centuries. Usually unferruled, they have the great benefit of not rolling around when put on the bench. Another

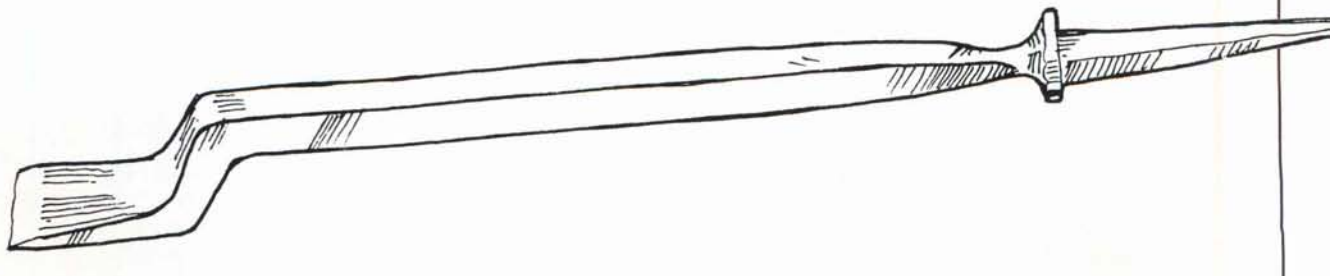


Figure 11 Dog Leg Chisel

common pattern is the South Kensington pattern which became popular in British trade schools around the turn of the century. This and many other types are made to accept a ferrule, although if a tool is properly handled, it's not absolutely necessary. Proper handling refers to fitting the tool with a handle in perfect alignment with the direction in which you apply force. The actual wood used for the handle may be almost anything, but hardwoods such as mahogany, rosewood, boxwood, beech, ash, and other relatively close–grained woods are ideal.

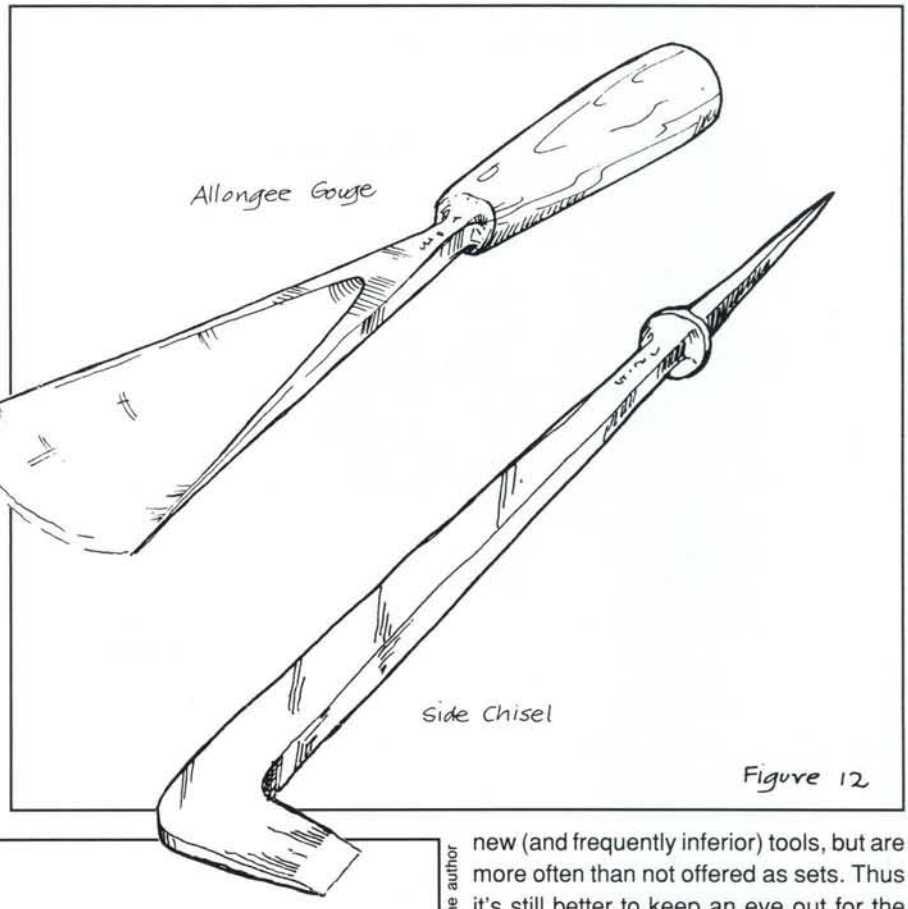


Figure 12

Makers

Since the 1850's the carving tool world has been dominated by the English name of Addis. Less carving is done today than before, but Addis chisels are still the most highly prized. Other names worth remembering are Herring, Henry Taylor (user of the well known acorn logo), W. Harrington, and the famous Scottish firm of toolmakers, Alexander Mathieson. Many second–hand carving tools appear at auctions, often for far less than the cost of new (and frequently inferior) tools, but are more often than not offered as sets. Thus it's still better to keep an eye out for the individual carving tool at fleamarkets and antique stores. These may be rusty and unhandled but can be a tremendous buy. Don't begrudge the time needed to resharpen them since even brand new tools are often sold only ground to shape and require a lot of work before they can be used profitably.

illustrations by the author

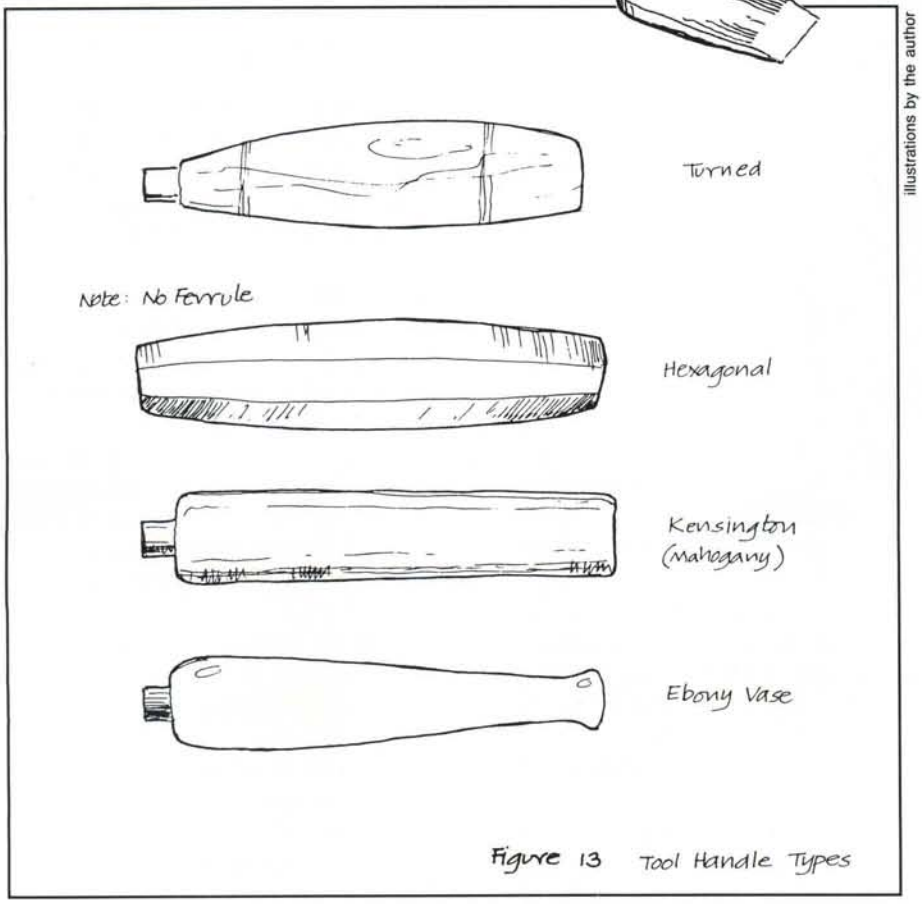


Figure 13 Tool Handle Types

The fact that initial sharpening is tediously time–consuming is another good reason to obtain your tools as you need them. It's far easier to sharpen tools one at a time than be faced with the repetitive chore of conditioning a set of a dozen or so all at once. This invariably leads to many tools going unused, or worse, being used in less than perfect condition.

You can find many other carving tools and accessories—files, rifflers, mallets, clamps, holdfasts, and of course the moto–tool—but by starting out with a good overview of the available range of chisels and gouges, you'll be ready to pick your way through the enormous jungle of tools without feeling totally overwhelmed. PW

Air Helmets: Dealing with Dust

photo by the author

by Alan Marks

So you haven't gotten around to spending the couple of thousand dollars it would take to equip your shop with a complete dust collection system? No room for running ducts to each machine with a central filtration system and blast gates at each station? I don't blame you; a broom or a shop vac can do a pretty good job of clean–up at the end of the day...

But what about your lungs?

In the sidebar on page 23, I discuss the reasons why it's a good idea to avoid inhaling sawdust. Even with the best dust collectors, your respiratory system can still be in danger without some form of protection. Previously there were only a couple of ways to obtain this protection; I'm going to tell you about a more recent, more sophisticated method.

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

You've seen the canister–type half– or full–face masks available from American Optical, MSA, Sellstrom, Willson, North, and others. Maybe these work for most people, but I have not found them comfortable—no matter what the ads say. They give me a distinct feeling of claustrophobia. More often than not, I find myself gasping for each breath rather than breathing naturally; I think it's because of the resistance the filter medium presents to the flow of air. Then too, I have to deal with condensation inside the mask, problems with harness adjustment, and an eventual loss of elasticity in the straps.

And there are other potential problems. Woodworkers who wear glasses find that full–face masks do not seal properly around the temples. Others have beards and neither full–face masks (which shield the eyes as well) or half–face masks (which cover nose and mouth) form an air–tight seal against beards. Equipped with both glasses and a beard, and suffering day after day from sneezing attacks and sinus headache, it became necessary for me to find a better solution or stop woodworking. What headgear does a wise woodworker wear in the war against wood dust? The correct answer is an air helmet–a "supplied air device."

There are two types of air helmets. One involves wearing a hood or a helmet with a long hose hooked to an air compressor with a filter, or one located in a clean environment. This doesn't give much freedom of movement and it complicates walking from machine to machine in the shop. It is not the method of choice.

The other type is the Powered Air Purifying Respirator (PAPR). PAPR's are entirely self–contained, portable units worn on the user's person. When you use a Powered Air Purifying Respirator you are surrounded by purified air that is yours for the breathing. This air is under a slight positive pressure; your head is bathed in a curtain of clean air that continuously exits through available openings—supplied vents or gaps left in the seal.

This article covers seven air helmets which I examined and used. They were produced by four different manufacturers. I'll be taking a look at two helmets from 3M, two each from Racal and Kasco, and one from Neoterik.

Neoterik and 3M are American companies; Racal is British, while Kasco is Italian. To the best of my knowlege, these companies are the only ones who manufacture air helmets which are available in the United States.

In addition to helmets, there are also PAPR face masks which are fed air from belt–worn fans and filters; they're fine for agricultural and other applications, but I did not consider them suitable for woodworking. When air hoses enter at the front of the face masks, they interfere with machinery operation. With hel-

mets, the air hoses all attach at the rear, out of the way.

Moreover, the helmet units I considered were selected because they had visors. It is not necessary to remove them when taking a break, as with a face mask. One merely lifts the visor.

Evaluation

Some helmet respirators are sealed more efficiently than others, and under certain conditions, some dust can enter when contaminated air exerts a counter–pressure. This can happen, for example, when you turn your head quickly, breaking the seal, and contaminated air forces its way into the cavity. The ability to form a good seal was an important consideration. For test purposes, I cut Western red cedar, which has a particularly pungent odor. The smallest whiff of it can be immediately detected. The seal broke frequently when I used the Racal Airstream and on occasion when I used the 3M Airhat.

I think a helmet should be comfortable to wear for extended periods of time. The Kasco Kompat S, has everything in the helmet, a fan which supplies air, a filter, and rechargeable batteries to power the unit. The Racal Airstream and the 3M Airhat have fan and filter in the helmet, and a battery pack that clips to your belt or your pocket and connects with a wire. The remaining units reviewed here consist of helmet assemblies supplied by an air hose that connects to a belt–worn fan/filter unit powered by a clip–on battery pack. These helmets are, of course, the lightest and most comfortable in general because they contain the fewest guts.

I spent some time trying to understand how the Kompat S from Kasco can be worn comfortably by anyone with a normally shaped skull. My head banged against the fan on the inside rear of the helmet until I discovered that the fan unit can be extruded backwards, out of the way, through a sealing collar. My head size is 6–3/4 and I have to cinch the adjustable strap all the way to stabilize the helmet on my head. Except for this, the Kompat S is ideal; it seals perfectly, it does not *feel* heavy—despite being the heaviest unit tested, and it is the easiest to put on and remove of any of the units I tested.

The 3M Airhat is a substantial, heavy unit, but it has a point–of–balance adjustment for the head strap to make it easier to bear. I really liked the thing, despite the fact that it did not have a perfect seal; some Western red cedar and some redwood dust leaked in—two substances which wreak havoc on my sinus cavities.

The Mini–Breezer was delightfully lightweight. It sealed perfectly, but it, too, had a major shortcoming. In the version sent to me, one with a soft Tyvek® hood with a drawstring, the hood front can pivot upward on a ratcheting adjustable headband. In theory, its clear plastic faceplate ought to to flip up out of the way, but in actual use, it can't. The way the air hose attaches doesn't allow for it.

Visibility is another consideration. The Racal Airstream has a molded visor with some complex curves in it Because I wear bifocals and have to look at close objects at a downward angle,

The Health Hazards of Dust

For some woodworkers, dust protection is absolutely indispensable. Richard Raffan, a well–known woodturner who lives in Australia, uses his Racal Airstream at the lathe. I understand that he recently had to cancel an appearance at a seminar in Oregon because either he neglected to put it on prior to turning, or he did not check that it was operating properly. He suffers from serious allergic reactions to the dusts of certain woods.

Some woodworkers have allergies right from the start. Others get them through exposure. Nobody ever warned me that sensitization to an allergen could occur after years of exposure.

Originally, the only wood I had problems with was redwood. Since redwood is a species which lots of people have a reaction to, I didn't think much of it. I had no dust collection system, and for years I just endured the dust problem in my shop. I had some protection, because all the machinery was in one room and I did assembly work and fine–tuning in the bench room. When things got absolutely unbearable, I fled to the clean air there. And so it went on for years until I gradually developed a problem with oak dust, too. Then after a time I couldn't stand the dust from plywood. I'd get headaches and nasal congestion, and felt generally rotten when exposed to these. Then, even that most benign species—Douglas fir—got added to the list of woods I was allergic to.

Cancer Risk

There is an even more compelling reason for keeping the air you breath sawdust–free. OSHA recently set more stringent limits for wood dust because researchers have come up with irrefutable evidence that prolonged exposure to wood dust causes nasal cancer and respiratory ailments. Whereas previously wood dust was considered a "nuisance" contaminant, it is now labelled "toxic." Actual limits are 5 milligrams per cubic meter of air for hardwood and softwood dust, and 2.5 milligrams per cubic meter for Western red cedar because it is considered an allergenic species. My own, unqualified opinion is that any species of dust is bad for human beings, and among the particularly nasty ones are those produced when working with MDF, plywood, and particle board, since most of these materials contain urea–formaldehyde.

If you have ten employees or more, you are on the list for OSHA inspection, but even if you have only one or two, you may still incur a shakedown if an employee complains about conditions, or if there is a work–related injury or fatality. Employers had until the first of September 1989 to comply with the new dust standard through the use of ventilation, dust collection systems, or respirators and protective equipment. However, on December 31, 1992, unless other methods are not feasible to implement, respirators and protective equipment will no longer be enough.

What does this mean for you if you are an employer who does not have the immediate funds to upgrade your dust collection system? You will have to supply interim respirator protection. If you work alone in your shop, and do not have a dust collection system, it seems essential to invest in a good respirator to protect your health. PW

this presented a problem. The curves induced distortion. All other units were problem–free in this respect.

Getting It On

It shouldn't be difficult to put on a respirator; I have found that the temptation to neglect wearing the respirator increases directly in proportion to the difficulty of putting it on.

The 3M Whitecap is a well–made, comfortable, reliable piece of equipment, but I found it cumbersome to put on. I had trouble putting my head into the harness, and it was necessary to use the chin strap to stabilize it—yet another inconvenience. The version I used came with two shoulder shrouds—an inner shroud of cotton and a heavier outer shroud of some material stiffened with flexible plastic. Like most of the other units, its belt attached with a Fastex® buckle, and on the belt were mounted the battery and the fan/filter unit. It did, however, have a feature none of the others have: when airflow gets below an acceptable level, it sets off an audible alarm as well as a flashing light on the fan/filter unit. The sound of the alarm travels through the air tube so there is no danger of not hearing it. If a filter clogs up, you are immediately apprised of it. It was so cumbersome to take off and put on, however, that I didn't find it suitable for small shop situations. It is more of an industrial unit.

Two Applications

I hoped to test a unit from each manufacturer that could also be used in the spray booth for filtering out organic vapors. Kasco's K80s has this capability. The K80s has a helmet shaped almost exactly the same as the Kompat S, but unlike the Kompat S, it does not feature an integral fan/filter and built–in battery. (These attach separately to a belt, and the air is supplied through a flex hose.) Consequently the helmet feels extremely comfortable and lightweight. Donning the outfit is a bit awkward, mostly because of the heavy lead–acid battery attached to it. The K80s was the only unit that had a lead–acid battery; all the others had NiCads. There are advantages to both types, but I'll touch on this later.

photo courtesy of Kasco

The Kasco Kompat S has everything—fan, filter, and rechargeable batteries built into the helmet.

The 3M Airhat is a quieter unit because it doesn't cover your ears. A point–of–balance adjustment in the head strap helps balance the load of the built–in fan and filter.

photo courtesy of 3M Occupational Health and Environmental Safety Division

Racal's Breathe–Easy can be used for either dust or organic vapor filtration; it uses three filters in order to satisfy OSHA requirements for organic vapor filtration. The Kasco K80s-T5 will accept a single organic vapor filter, which makes it less expensive. The filter works, but it does not satisfy this OSHA requirement. The version in the K80s series that will, the K80s–T5N, has three filters like the Racal Breath–Easy, but I didn't test that unit.

If you want to use the Neoterik Mini–Breezer in the spray booth, you can get a special mini–compressor and a fifty–foot hose that attaches, via an adaptor, to its rubber air supply hose. An optional filter attaches to the compressor, which can be located somewhere in a non–contaminated part of the shop, or even outside. The cost of adding this capability: $345. If you don't mind trailing a hose behind you in the shop, you could simply buy a compressor–supplied unit for about $480.

Battery Packs

Batteries are a tricky topic. It is claimed that due to the design of the Kompat S battery charger, the capacity of its batteries is not diminished if you charge them before they are fully discharged. But I have always read that NiCads need to be completely drained before they are charged; otherwise they lose some of their capacity. It is not always possible to follow this rule since frequently the air helmet does not see full eight–hour use during the working day. Five or six hours might be common, leaving two to three hours' capacity still unused. If you start the next day with only two hours' worth, you may well get caught short. One answer is to have a spare, fully–charged NiCad battery on hand to replace it and to put the exhausted battery in the charger

photo courtesy of Racal Health & Safety, Inc.

The Racal Airstream has the fan and filter built into the helmet, and is operated by a battery pack that attaches to your belt.

photo by the author

The fan, filter and batteries of the Neoterik Mini–Breezer are worn on the belt and connect to the Tyvek® hood via an air hose.

immediately for the usual 14–hour or so charge.

The other answer is to use a Kasco K80s with a lead–acid battery which does not require a full discharge before recharging. Furthermore, the lead–acid battery takes only six hours to fully recharge, compared to 14 to 16 for most of the NiCads.

However, lead batteries have certain weaknesses as well. For one thing, they cannot be left in a discharged state for any length of time without becoming totally useless. Such treatment doesn't usually affect a NiCad. Lead–acid batteries are heavy and can be recharged only about half the number of times a NiCad can before losing their usefulness.

Of all the units I tested, only the Kasco Kompat S had everything, including NiCad batteries, integrated into the helmet. On the one hand, this appeared to me to be a distinct plus; it made putting on the apparatus a breeze, (no pun intended). On the negative side, if your batteries run down in the middle of work, you are simply out of luck. With other units which use a separate battery pack to power the fan, it is easy enough to have a fully–charged battery pack on standby at all times. The Kasco

photo by the author

The Kasco K80s–T5 is powered by lead–acid batteries which can be recharged without being completely discharged.

Air Helmet Comparison Chart

Unit	Weight	Cost (U.S.)	Battery Pack				Motor		Filter Expense	
			Charge Time	Charge Life	Exp. Life	Cost	Exp. Life	Cost	Dust	Org. Vapor
3M Airhat W316	3.5 lbs	$519	14-16 hours	8-10 hours	400-1000 cycles	$165	1000 hours	$168	$8.50	N/A
3M Whitecap II w. Whitecap PAPR	3.4 lbs	$656	14-16 hours	7 hours	400-1000 cycles	$165	1000 hours	$110	$21	N/A
Kasco K80s–T5	1.75 lbs	$429	6 hours	4 hours	200-1000 cycles	$98	1000 hours	$90	$26	$35
Kasco Kompat S	3.75 lbs	$359	3 hours	4 hours	300-2500 cycles	$116	400 hours	$75	$2.60	N/A
Neoterik Mini–Breezer	1 lb	$375	14-16 hours	5 hours 8 hours	800 cycles	$128 $158	2500 hours	$200	$45	N/A
Racal Airstream AH-5	1.9 lbs	$482	14-16 hours	7-8 hours	2 years	$122	1-2 years	$230	$11	N/A
Racal Breath–Easy I	1.7 lbs	$650	14-16 hours	7-8 hours	2 years	$143	1-2 years	$130	3 @ $10	3 @ $13

photo courtesy of Racal Health & Safety, Inc.

The three–filter system of the Racal Breath–Easy satisfies OSHA requirements for organic vapor filtration, so it can be used when spraying wood finishes.

Kompat S's batteries are rated to hold a charge for a maximum of 4 hours–hardly a full day's worth. Then again, under most circumstances, the use of a filtration unit is intermittent. The Kompat S's batteries are owner–replaceable, and they should last the longest of all its replaceable components. The expected life of its fan motor is 400 hours and it will be the second most frequent item to need replacement—next in line after the filter.

You can consider this breakdown fairly typical of all the units under review, so I recommend taking a look at how much it costs to replace a fan motor on any unit considered for purchase, how long it may be expected to last, and how much filters cost (see the chart on the previous page).

The Down Side to Air Helmets

As with most congenial solutions to problems, they introduce a few new problems into the picture.

For one thing, fans and airflow make a racket which blocks out a lot of machinery noise. At first, this might seem like a plus, but often the sound of a machine in operation gives vital clues as to how well it is performing, whether the material being worked might be splintering or kicking back or binding, or whatever. To be out of contact with what the machine is doing can be dangerous. Additionally, fan noise makes it harder to communicate with other people, and you can't hear a telephone ringing.

What's more, because a constant background noise creates worker fatigue, it cannot be tolerated for long periods of time at certain levels. The Kasco K80s-T5 was particularly obnoxious in this respect. Because your ears are not contained within, the hard hat design of both the 3M Airhat and the Racal units don't have this problem. The 3M Whitecap is engineered with a double helmet shell that baffles sound and distributes airflow.

Some PAPR's have drawstrings to seal off a loose–fitting shroud that attaches at the lower part of the helmet and covers your shoulders and neck. I was concerned about drawstrings on the Kompat S and the Neoterik Mini–Breezer catching in revolving cutters, knives, and such.

Still another concern is hearing protection. Some helmets in themselves afford some protection, though perhaps not enough in all situations. The Neoterik Mini–Breezer definitely does not shut out noise. Nor do the 3M Airhat or the Racal units. Fortunately the Mini–Breezer does have ample room for headset hearing protectors. However, some units don't, so you'll need to rely on ear plugs.

A bald contractor friend of mine has a special kind of problem with his air helmet. The one he chose to buy, the Racal Airstream, directs a steady stream of air over his naked scalp; this chills and dehydrates him at the same time. He wonders if wearing a skull cap might spare him this discomfort, but as yet, the solution to this unwanted side–effect hasn't manifested itself. The 3M Whitecap II with its double wall construction directs the air away from the scalp, partly to avoid this. Nevertheless, dehydration does occur under any circumstances. Despite the fact that I am not bald, I got quite thirsty while using these respirators. Having something to drink on hand seems essential, particularly in dry climates.

Such problems seem minor, however, compared to the benefits to be realized from using one of these units. Consider me a confirmed convert. My recommendation: wake up, and put on a helmet—even if you can't smell the coffee, you'll like the clean air. My personal favorite: the Kasco K80s. PW

Manufacturers and Distributors

Neoterik Health Technologies, Inc.
401 Main Street
Woodsboro, Maryland 21798
(301) 845-2777

Racal Airstream Division
7309 Grove Road
Frederick, MD 21701
(800) 682-9500

3M Occupational Health
and Environmental Safety Division
Building 220-3E-04, 3M Center
St. Paul, MN 55144-1000
(800) 666-6477

Kasco
Via Romania , 12
42100 Reggio Emilia, Italy

distributed by:
Leinbach Machinery
5000 Reynolda Rd.
Winston–Salem, NC 27106
(919) 924-4115

The St. George Company Limited
206 McPherson School Road
St. George, Ontario
CANADA NOE 1NO
(519) 442-2046

Sharp & Son, Inc.
900 Lind Ave. SW
Renton, WA 98055
(206) 235-4510

A Popular Woodworking Project

Bent Wood Indian Boxes

by Warren Asa

Blessed with a benevolent climate, fertile soil, ready sources of food, and some of the finest timber trees in the world, the native American tribes of the northwest coast produced a unique array of arts and crafts. The Tlingit, Tshimian, Haida, Bella Coola, Kwakiutl, Coast Salish, and Nootka not only made marvelous dugout canoes, but created the totem pole, the planked house with decorative walls, the dance screen, the Chilkat blanket, *and the bent* wood box.

If you get a thrill when all the parts of a complex piece of furniture fit perfectly together, you'll really enjoy making a bent wood box. When you steam and bend the grooved plank, it forms four sides right before your eyes. And after you've been carving and painting the box for a while, the intricate animal designs seem almost to come to life.

Although I have great respect for the native American craftsmen, I haven't tried to duplicate their boxes in every detail. Theirs were generally large; I keep mine smaller. They used Western yellow and red cedar, woods I don't have. They decorated the entire surface of their boxes while I just use a few of their choice designs. I have, however, tried to stay close to their methods. There is no one right way to make a northwest coast box, as you'll realize when you visit a museum and see the many variations. What I've outlined here is a fairly authentic approach to a fascinating old art form.

The Indian approach differs from traditional European ideas of woodworking (see "Making Bent Wood Boxes," *Popular Woodworking* # 40, December/January 1988). Viewed from the top, the Indian boxes are square or rectangular—and all four sides are made from one plank. Three of the corners are formed by grooving and bending, and the fourth is rabbeted and either pegged or sewn with spruce root.

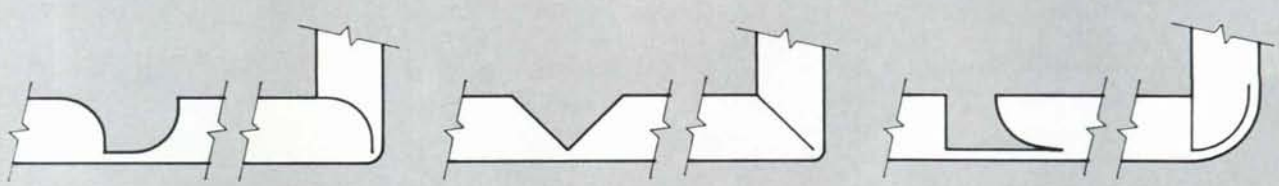
Figure 1 illustrates three methods of shaping the bending grooves. The first is an ancient method; the next is sometimes used on commercially produced boxes but is not authentic, and the third, or some variation of it, is favored by most contemporary Indian artists. The ancient groove design could have been carved with stone and antler tools, but it must have been a lot easier with steel tools which these tribes acquired long before their first contact with the Europeans. Perhaps they bartered for steel with the Aleuts, who got it from Asian traders, or maybe they salvaged it from wrecked Oriental ships carried to their shores by the Japanese current. The top and bottom are rabbeted to fit, and the box is covered with carvings and painted. They held food and belongings, and were tight enough to hold water for cooking, which was accomplished by adding hot rocks to the food and water in the box.

photos by the author

The finished boxes above include a holly box with fish designs, oak with mammals, ash with birds, and a killer whale wall hanging.

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

Fig. 1. Bending the Box Corners



a. Ancient Indian Method **b. Commercial Production** **c. Contemporary Method**

illustrations by Tom Larson

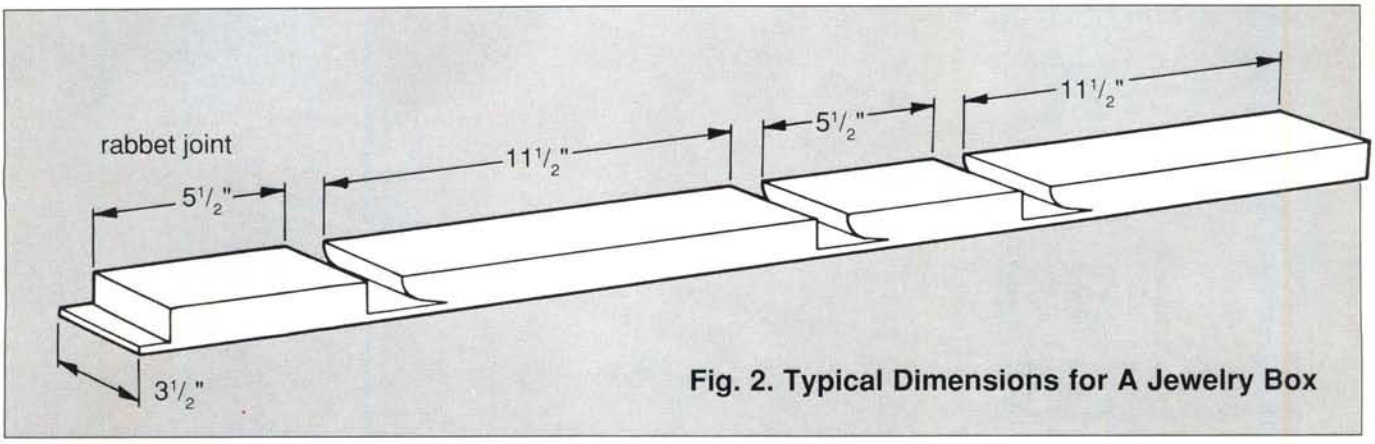
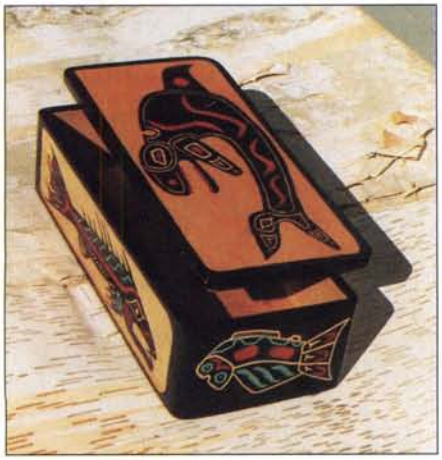


Fig. 2. Typical Dimensions for A Jewelry Box

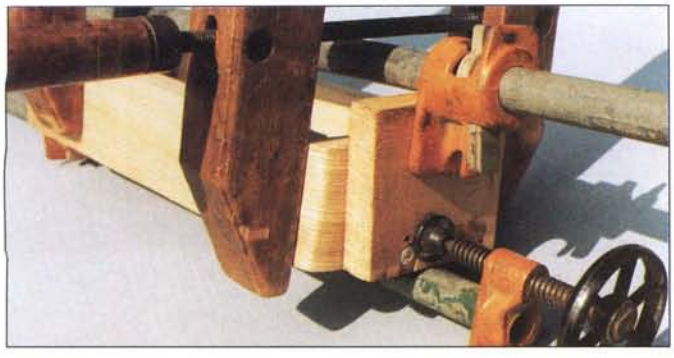


They used red and yellow cedar, but you can use maple, elm, hackberry, alder or any wood you've bent successfully. My favorites are white oak, ash and holly, and the photos show boxes made from each. Be sure to select a quarter–sawn board with straight grain and no flaws. Don't try to make a box from green wood. For jewelry boxes, 1/2" to 3/4" stock is ideal; larger boxes need 1" to 1-1/2". All of the boxes pictured here are for jewelry, but they can be made larger and used as toy boxes or blanket chests. One about 17" high and carved with a glass top would make a colorful and imposing coffee table. The native American boxes varied from bread box size to about the dimensions of a steamer trunk.

The first step is deciding on the size and laying out the board (Figure 2). Dimensions are tricky; you won't know exactly how they will work out until you make one. If you're using 3/4" stock and cutting as shown in Figure 1c, 5/8" will be lost from each side because each tucks into a corner when it's bent (and the fourth side tucks 3/4" into the rabbet). You must also take into account how completely the wood hinge wraps around the corner. This can vary with the wood used, the thickness of the hinge, and how you shape the "fishtail" section of the groove.

After laying out your plank, cut it to length and cut the rabbet on one end. You'll round it later to match the bent corners. The next step—and it's the big one—is to cut the grooves. Note that the contemporary Indian method (Figure 1c) makes the thin wood hinge extend 1" or more. The flexibility of this long, thin hinge makes box construction much easier than it was in the past. A purely handtool approach would involve backsaw and chisels for the main cut, and a coping saw and chisels for what I call the *fishtail cut*. The Indian craftsmen use a knife with a bent blade here; Woodcraft Supply Corp. (41 Atlantic Ave., Box 4000, Woburn, MA 01888) sells them as curved end knives. Or you can cut the main groove with a dado and do the fishtail with a combination of router bits. This is the fastest way and lends itself to production work. I cut the outside edges of the main groove with two passes over the table saw, and then chisel out the core. I saw out the fishtail with either a coping or band saw, and finish up with chisels and a bent knife.

The photo above left gives a closer look at the holly box. The author uses a curved knife to finish a fishtail cut. Below, an ash box has been bent and clamped. To the right, are ash and holly boxes with the bottoms glued on. The oak box in the center wasn't steamed sufficiently and became firewood.



The secret of fine bent box making is to cut grooves of uniform depth and width. To avoid corners that are out of kilter or angular rather than rounded, strive for accuracy in laying out and cutting the grooves. If you use the band saw, be sure to keep the board absolutely vertical. On jewelry boxes I like to make the wood hinge 1/8" thick, and 3/16" thick on larger boxes. Many of the ancient Indian boxes show a concave shape carved on the side opposite the groove, but I don't recommend this method for your first box as it's too easy to fray the wood fibers during bending. The Indians used this method to thin down the wood for easier bending and to yield a greater curved surface for decorating.

The native Americans steamed their boxes on the beach with hot rocks and seaweed, which sounds like fun if you live along the coast. Since you must turn a 1" length of wood 90°, you will need steam. I made a primitive steamer by placing a clean metal drum over a hot fire. With a few bricks inside so the wood doesn't rest directly in the boiling water and a sheet metal lid on top, I bent three boxes after an hour of steaming. The wood had been soaking in water for two days before. If your wood remains stiff after the same amount of soaking and steaming, it may not be suitable for bending, or the hinges may be too thick. If the wood bends slightly but not the full 90°, flex it as far as possible without causing undue strain, tie it in this position, and steam it some more.

A few errant fibers may break loose during bending and stick out like an unruly moustache. They can be sanded off later. The ancient Indians had this problem, too. If you use wood that's cross-grained, you'll have major fiber breakout.

Bending the box is an exciting experience—you'll get quite a thrill when the hinges bend, the fishtail cuts close and suddenly you have a three-dimensional rectangle instead of a flat board. After bending, hold the four sides in place with a combination of straps, clamps and ropes—but not too tightly. The wood hinge can squash and distort. Let the box dry for a few days before proceeding.

illustrations by Tom Larson

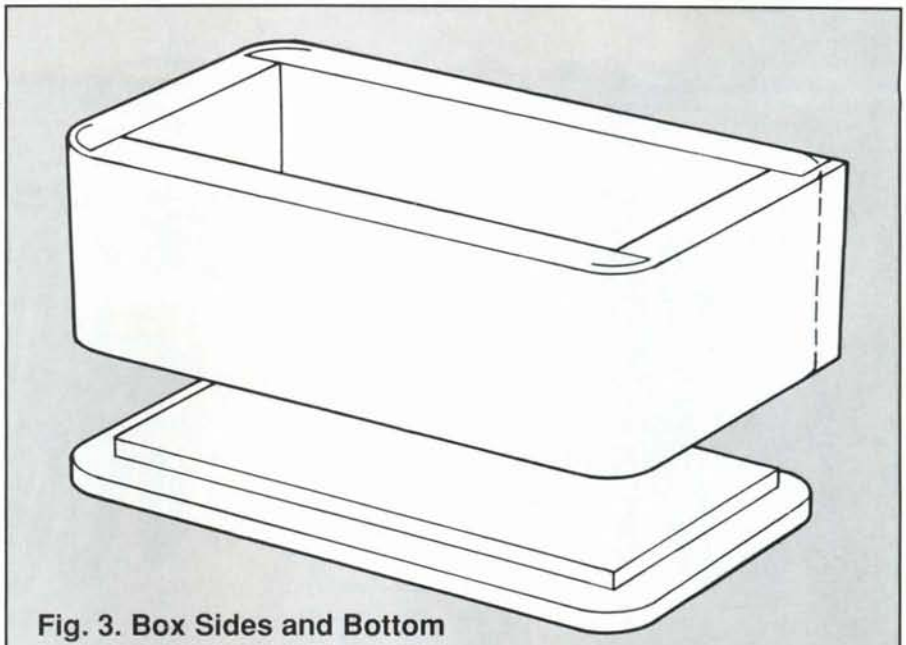


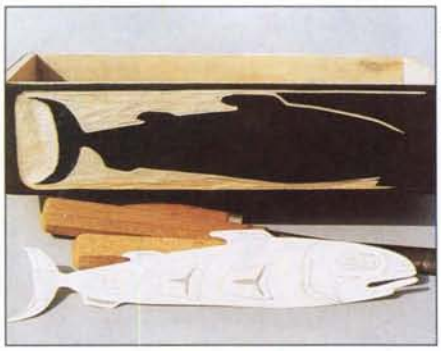
Fig. 3. Box Sides and Bottom

The next step is fitting the bottom. I rabbet this piece on the table saw. Before attaching it, sand all inside surfaces. Glue all four corners of the box together at the same time you glue on the bottom. Clamp and let dry. Then sand the outside and bottom. A disc sander is ideal for rounding the rabbeted corner to match the bent ones. Be sure the upper surface of the sides is level and square with the rest of the box or the lid won't sit properly. If you like, make a removeable tray to fit inside.

Decorating is another fun part of this project. The motifs of the northwest coast tribes are highly stylized, whimsical, and often humorous. Most of the basic elements are animals real or imagined, although at first glance their identity is not always apparent. With a bit of study, head and eye, beak or mouth begin to show, but the body often appears covered with odd, repeated designs, and then there are those "eyes" all over the place. Anthropologists say the designs may represent feathers and even internal organs, while the "eyes" may indicate joints. The ancient native Americans apparently abhorred empty surfaces, for they did their best to fill every square inch of the animal body. Figures 4 and 5 show some commonly used design elements.

Authentic northwest coast carvings are black and red but with much of the natural wood showing. Occasionally a greenish turquoise and more rarely a light yellow can be found. This limited number of colors might seem restrictive, but it gave them all they needed to create powerful, visually striking decorative effects. The best way to get design ideas is to visit a museum or check out some books on Indian crafts and culture. The largest

The boxes in the two photos below left were painted black before the author started carving out the designs. The designs on the oak box to the right are just painted on.



photos by the autho.

Figure 4

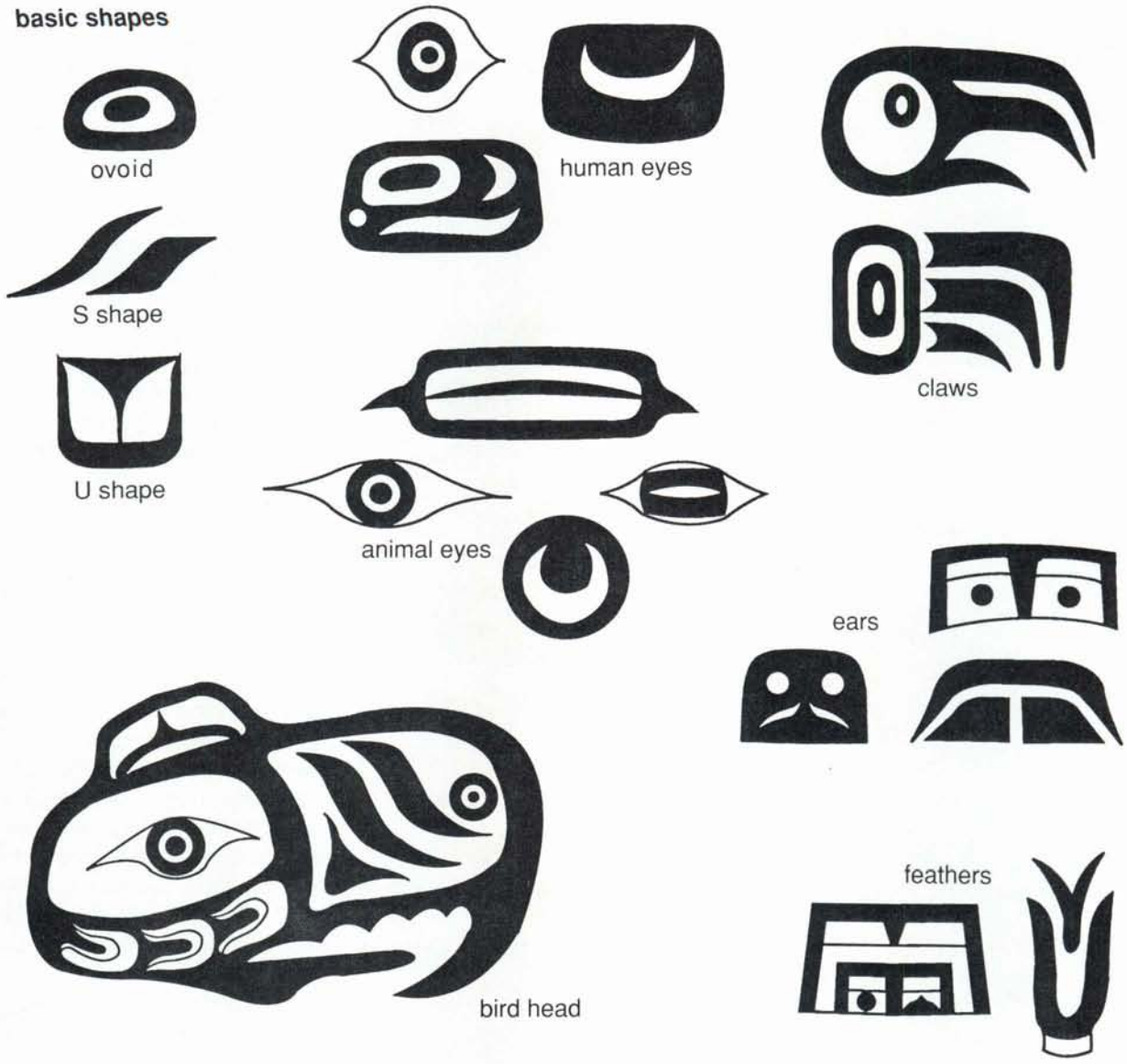


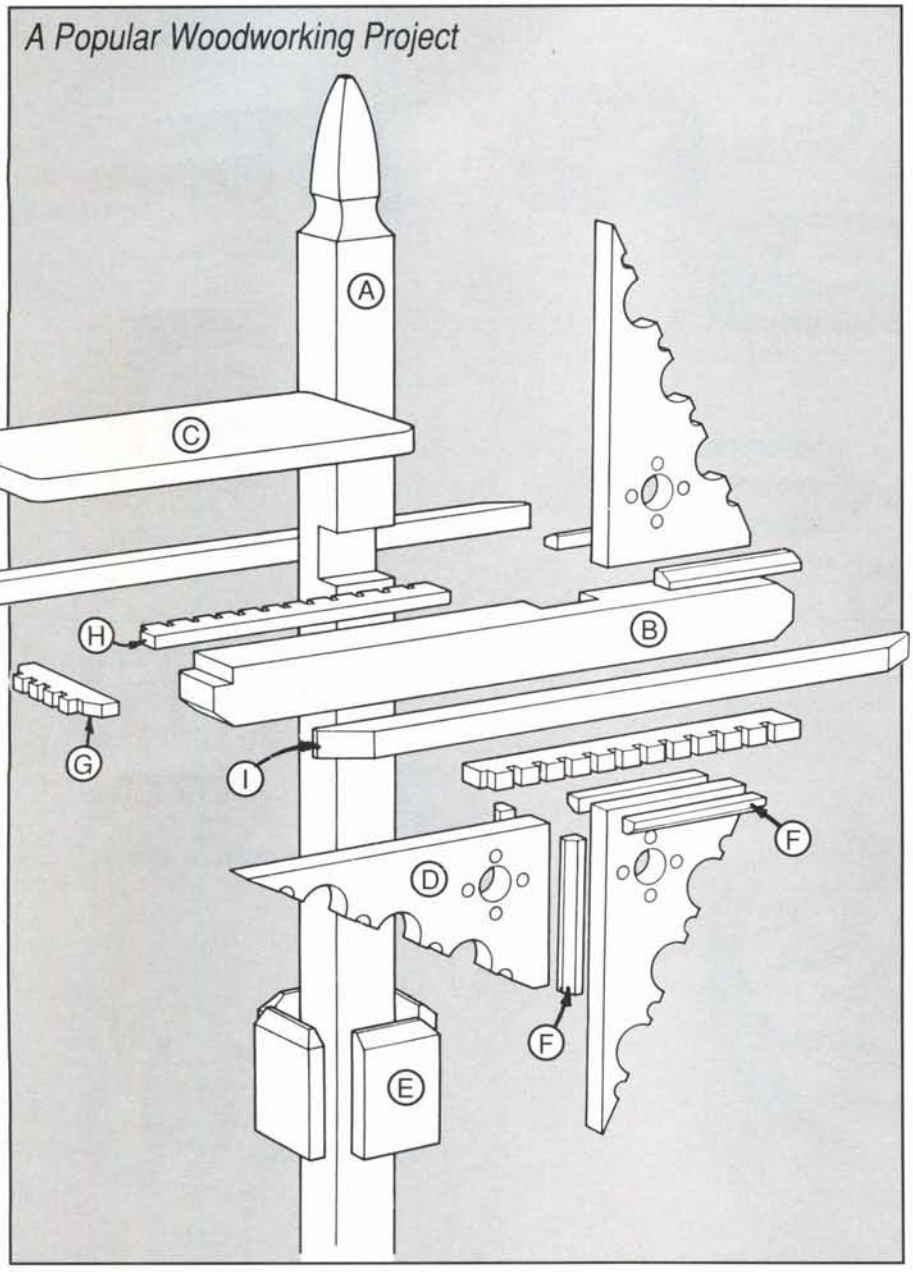
Figure 5

design usually goes on the lid, with smaller ones on the four sides. Wherever you get your ideas, I suggest that you never copy them exactly. It's easy to give these beautiful designs a personal interpretation, and this will make your boxes as unique and individual as those made by the ancients.

My usual approach is to paint the entire surface black, or at least the border and the body of the animal. To transfer the design onto the black surface, first rub the back of the paper with white chalk, then place the design overlay in position and trace over the lines as if you were using carbon paper. The design will come out in white. I then carve all the black paint from around the design, leaving it to stand out forcefully. You don't have to carve deeply, and you can suit yourself as to whether to leave tool marks in the background. I then carve out the various design elements and fill in some of the previously carved areas with red. Lastly, I put in any black details. Some surfaces can be decorated with paint alone as, for example, the lid of the oak chest in the photo on page 27. Another approach is to carve out only the outline of the figure in the black background, and then add red or other colors. This technique was used on the ends of the small holly box in the photo (page 27).

Carving out the painted areas gives sharp lines, which I like. The Indians work in the reverse manner—first carving and then painting. I use good quality oil enamel for most of the painting, but sometimes artist oils for details. My carvings are of the shallow relief type; on larger expanses I use shallow rounded cuts, while details are usually done with angular cuts. When all carving and painting are done, give the inside and outside a coat of polyurethane. If you like, cover the inside with felt.

The box you've just made could sell for up to $400, but much more satisfying is the feeling that you've created something useful and beautiful in a tradition that goes back many centuries. PW



Victorian Mailbox Post

by Phil Keller

Looking for a mailbox post more imaginative than those available at hardware stores and home centers? Here's a real eye–catcher that makes an attractive decoration for your driveway entrance. Fabrication of the parts is simple, it's sturdier than the commercial models, and you can probably build it for less. It can handle number 1, 1-1/2, and 2 size rural boxes, and will look great with the country mailbox project coming up in the September issue of *Popular Woodworking*.

The post pictured was made from No. 2 southern yellow pine. Use a decay–resistant wood such as redwood, cedar, cypress, or pressure–treated lumber. If you choose the latter, handle it with care. Most pressure treating is done with chromated–copper–arsenate (CCA) which is toxic. Use gloves when handling and a mask when cutting. The parts are joined together with rust resistant fasteners. You can use nails, but exterior deck or drywall screws hold better.

Begin by cutting all pieces to size on the table saw as indicated in the Cutting List and in Figure 1. Cut the post itself (A) and the cross–piece (B) from 4 X 4 stock. You'll need a 6' length of 2 X 10 for the mounting board (C) and the three brackets (D), but save the diagonal cuts that separate the bracket pairs for later. The base trim pieces (E), bracket cleats (F), and the dentil bands (G and H) can all be cut from a 6' length of 2 X 6 stock. First rip one long 3/4" wide strip for the cleats, turn it, and rip it again to produce a 3/4" square strip, but don't cut it apart just yet. Next, plane the remaining stock down to 1-1/8" and cut the base trim pieces. Then plane down to 1" and cut the dentil bands. Finally, cut the side bands (I) to length from 2 X 2 stock.

If you like, simplify making the post (A) by using a 4 X 4 X 8' decorative fence post, available with a pre–shaped top from most lumberyards. Or buy a post cap and fasten it to the top of a 4 X 4. To make the cap shown in the photo on page 35, cut out the full–size pattern from the PullOut™ Plans in the center of the magazine. Transfer it directly to two adjoining sides of the post at one end. Turn one patterned surface face up and carefully saw out the shape on the band saw. Then tape the scrap pieces back in place, turn the second patterned surface up, and repeat the cuts.

If you don't have a band saw, you can shape the alternate design shown in Figure 2 on the table saw. Angle the blade to

A fly–cutter cuts the large holes in the brackets.

***Phil Keller** is a woodworker and writer in Pompton Plains, NJ.*

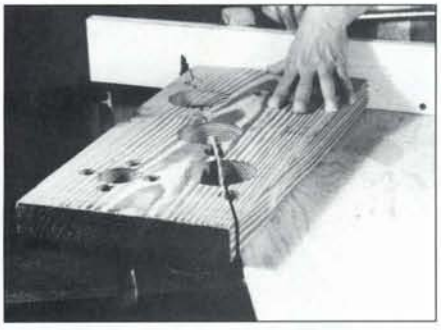
45°, set the miter gauge fence perpendicular to the blade, and try to make the cuts on each of the four surfaces line up precisely.

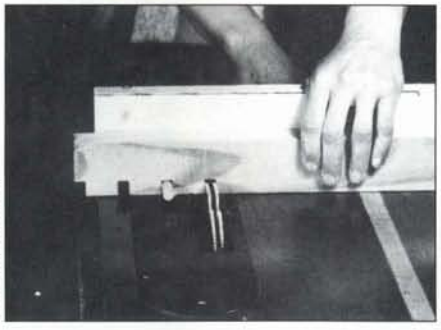
With the table saw blade still at 45°, crosscut bevels on three end edges of the cross–piece (B) as shown in Figure 2. Then bevel one top edge of each base trim piece (E) so that 1/8" of the end surface remains next to the bevel, as shown in Figure 3.

Now reset the blade to 30° and cut the bevel in the long strip you cut for the bracket cleats (F). Later you'll attach the cleats to the brackets with screws, so leave enough surface area on one of the edges adjoining the bevel to accommodate the screws, and you'll have the bevel positioned correctly (Figure 3). Reposition the saw blade to 90° and cut the bracket cleats apart. Next, set the miter gauge at 60° and cut the 30° bevel across the ends of the side bands (I). Leave 1/8" of the end surface remaining, as you did when you beveled the base trim pieces.

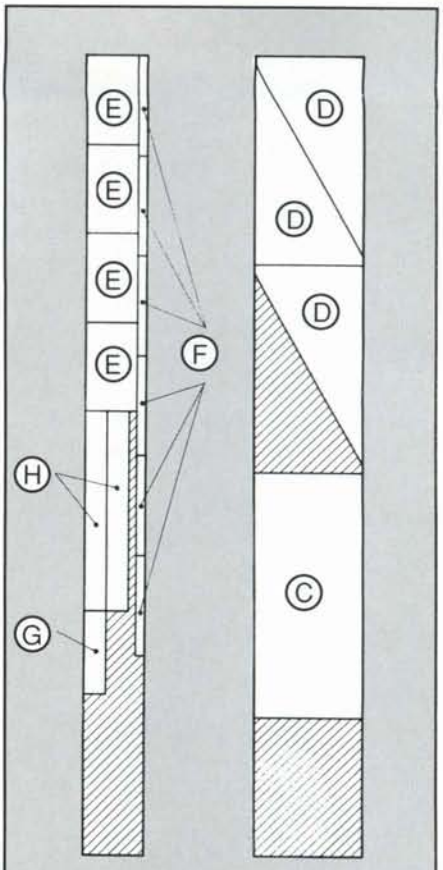
The pattern in the PullOut™ Plans shows the hole center locations on the bracket pairs (D). Transfer the layout to the stock and use a drill press and spade bits to make the smaller holes, and a fly–cutter for the 2" and 3" diameters. Center the holes precisely on the diagonal lines or the decorative edging will look irregular. You're now ready to cut the brackets apart on the table saw using the miter jig described on page 74. Round the

To construct this sliding miter table for your table saw, see the Project for the Shop on page 74. The jig for cutting the dentil bands is described in the Jig Journal on page 38.





photos by the author



illustrations by Tom Larson

Figure 1. Cutting Diagram

Victorian Mailbox Post					
Cutting List					
		Finished Size			
Qty	**Part**	**T**	**W**	**L**	**Piece**
1	A	3 1/2"	3 1/2"	96"	post
1	B	3 1/2"	3 1/2"	36"	cross–piece
1	C	1 1/2"	9 1/4"	22"	mounting board
3	D	1 1/2"	9 1/4"	18 3/4"	brackets
4	E	1 1/8"	4 5/8"	8"	post base trim pieces
6	F	3/4"	3/4"	9"	bracket cleats
1	G	1"	2"	7 1/2"	front dentil band
2	H	1"	2"	18"	side dentil bands
2	I	1 1/2"	1 1/2"	36"	side bands
Supplies					
30	#8 X 1 5/8" decking or drywall screws				
24	#8 X 2" decking or drywall screws				
18	#10 X 3" decking or drywall screws				

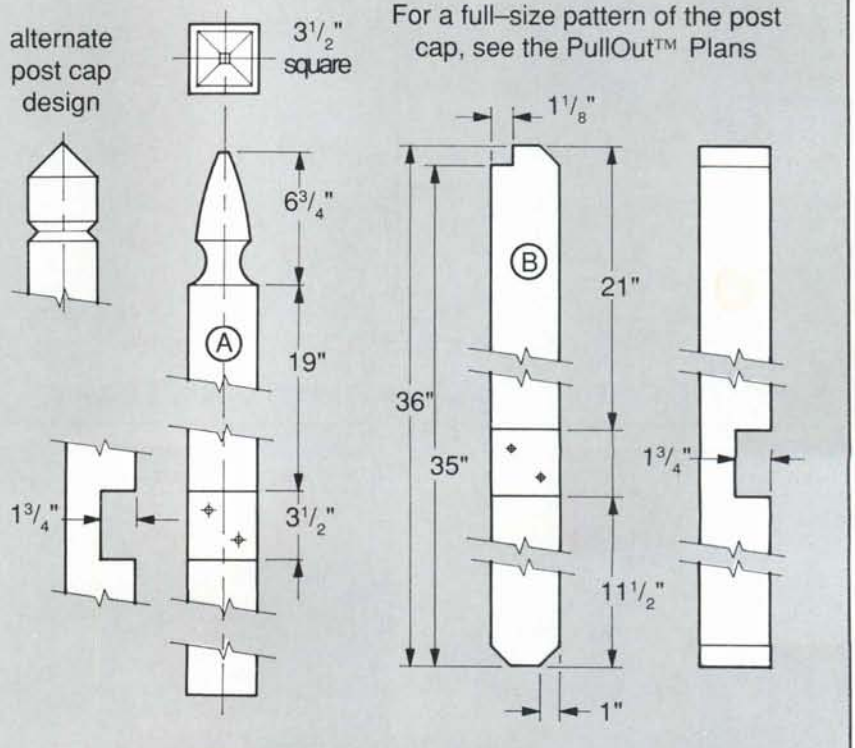


Figure 2. Post and Cross–Piece

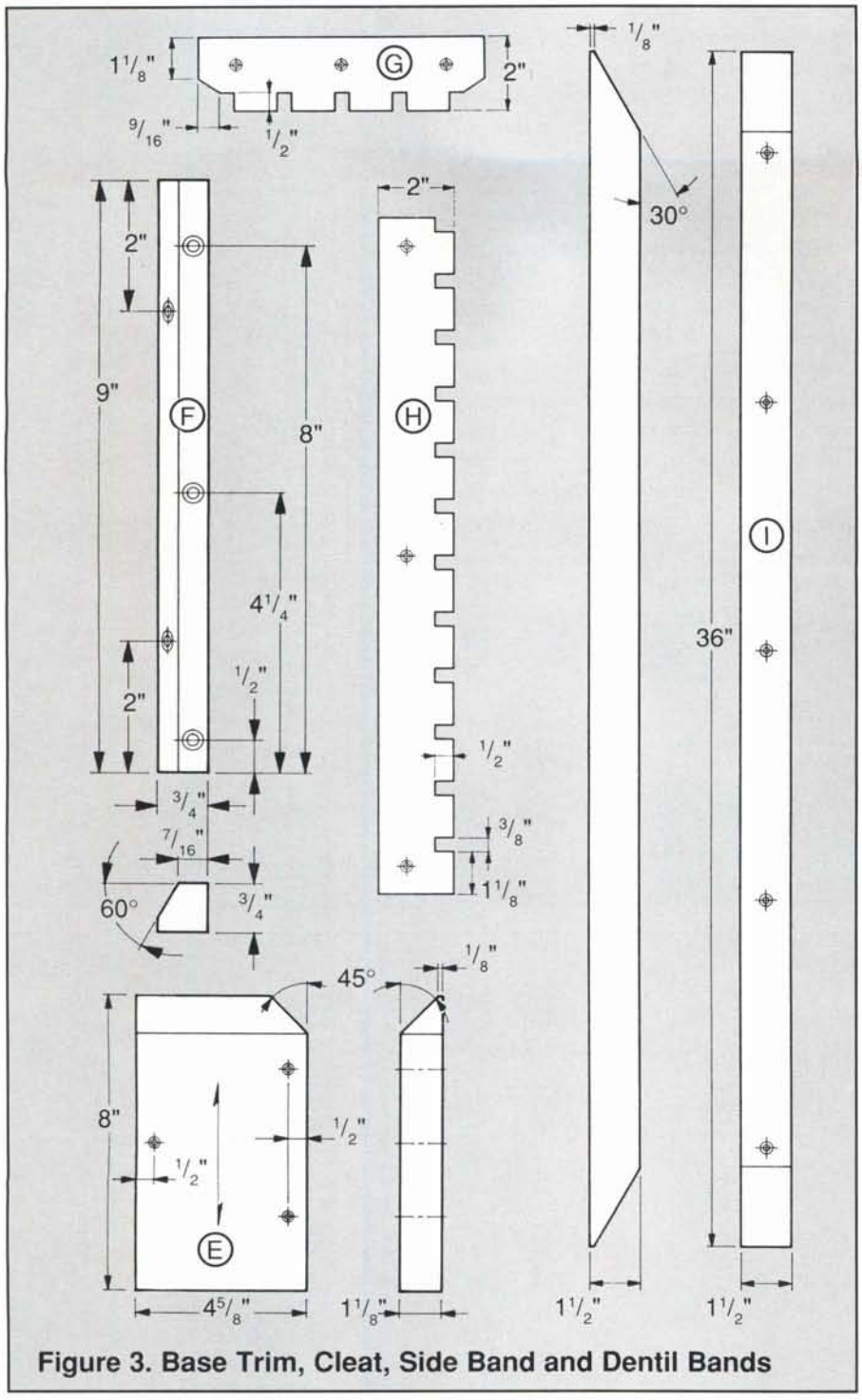
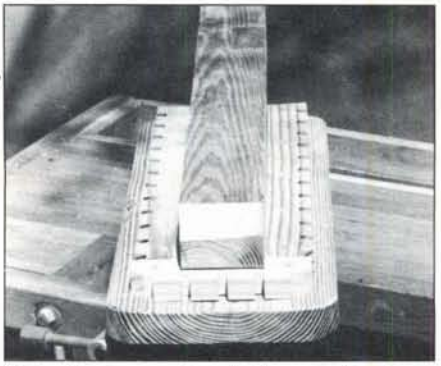
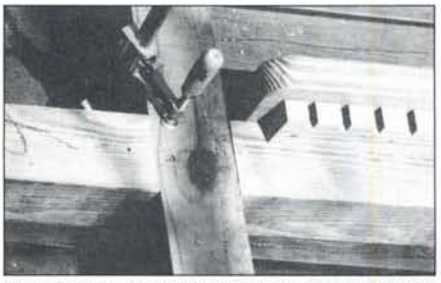


Figure 3. Base Trim, Cleat, Side Band and Dentil Bands

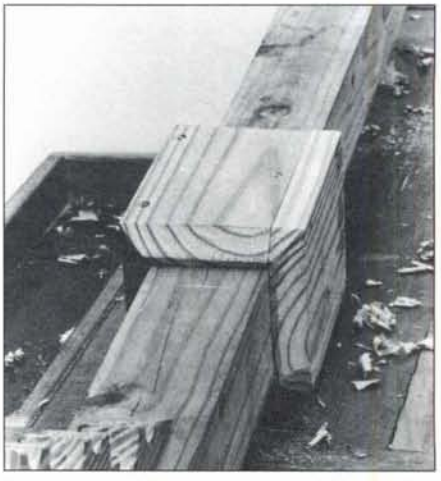
illustrations by Tom Larson



Screw the cross–piece to the mounting board through the side dentil bands. Note that the screw holes are hidden in the tooth spaces.

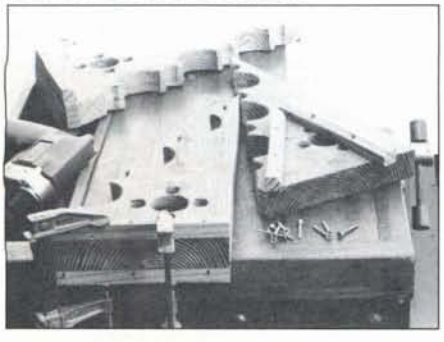


Use a cross–lap joint and screws to secure the cross–piece to the post.

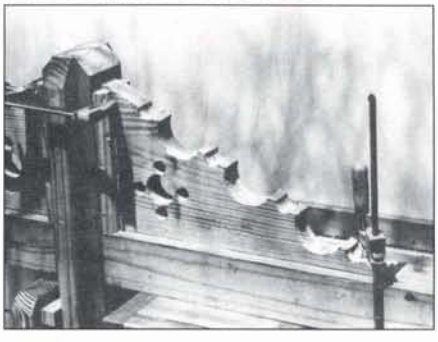


Base trim attaches to the post with simple butt joints that appear to be mitered. This design eliminates miter corners that open.

Clamp the cleats in position while you screw them to the decorative brackets.



Then clamp the brackets in place and screw them to the post and cross–piece.



hole edges and the diagonal line on three of the brackets (the fourth won't be used) with a router and a 1/4" corner rounding bit.

Round the corners of the mounting board (C) to a 1" radius on the band saw. Then round its top surface edges using the router and the same bit you used on the bracket edges.

Next, mount a 3/8" wide dado blade in the saw, set it to cut 1/2" deep, and cut the teeth in the front and side dentil bands (G and H). Saw a series of evenly spaced kerfs along one edge of each band—a jig similar to the one described on page 38 makes short, precise work of this task. Don't forget to bevel the front dentil band

as shown in Figure 3.

With the dado blade still in the saw, cut a 1" X 1-1/8" rabbet in the cross–piece (B) as shown in Figure 2. Then saw a 3-1/2" wide, 1-3/4" deep dado for the cross–lap joint with the post. Make a corresponding dado in the post for a snug fit with the cross–piece, and you're ready to put it all together.

Assembly

If you pre–drill all the screw holes in the locations indicated in the Figures, all you need do now is get your screwdriver or screw gun and some clamps ready. Begin by screwing the front dentil band and one side dentil band to the bottom surface of the mounting board (see the photos to the left). Place the cross–piece against these parts to locate precisely the position for attaching the remaining dentil band, and screw it in place. Then join the cross–piece to the mounting board. Position it between the dentil bands and drive six #10 X 3" screws through holes in the side dentil bands (these should be hidden between the teeth) and into the cross–piece.

Now join the cross–piece to the post. If the cross–lap joint is slightly loose, use a try square to position the parts accurately. Fasten them together with two screws through the post into the cross–piece. Position the side bands on the cross–piece and attach each with five screws.

Join two bracket cleats to each bracket with six #8 X 2" screws. Beginning with those behind the mounting board, attach the brackets to the post and cross–piece. Center them, clamp, and drive a pair of #8 X 1-5/8" screws through each cleat into the cross–piece. Then drive one #8 X 2" screw through each bracket edge into the post. Locate this screw inside the 3" edge circle nearest the the 30° corner of the bracket. Repeat this procedure to secure the remaining bracket under the mounting board.

photos by the author

Only the base trim remains. Its location on the post should be determined by the height requirement of the mailbox above the surface of the road. Check with your local post office for this dimension. Measure the required height down the post from the top surface of the mounting board; then screw the trim in place so that it projects 4" to 6" above the finished grade. Now you can apply the finish of your choice, or leave the post unfinished to weather naturally.

Installation

Locate an appropriate spot, dig a post hole to a depth that will put your box at the approved height. Be sure that the bottom of the post is below the frost line. If you don't know where the frost line is, check with your local building department. If the frost line is shallow or not a factor, you can cut excess material from the post bottom to reduce the hole depth. The pole should not, however, be set less than 18" below grade

Fill the bottom of the hole with 2" to 4" of gravel. Set the post upright in the hole, plumb it in all directions, and back fill the hole with a bag of ready–mixed concrete. After the concrete sets, attach your mailbox to the mounting board. Once the neighbors see it, don't be surprised if you're asked to build another. PW

A Popular Woodworking Project

Plate Shelf

by Bill Bullington

This shelf will show off your prized plates and display your favorite knick–knacks and small collectibles, while enhancing the decor of almost any room or hallway. They make great gifts or craft sale items, too.

Let's start with the end brackets (A). *Using* the pattern supplied in the Pull-Out™ Plans, lay out the two brackets and locate the dowel pin holes. Keep in mind that you must have a left– and a right–hand piece for each assembly. Cut them out with a scroll or band saw and drill the 3/8" dowel holes 1/2" deep (here's where you need to remember to make right– and left–hand pieces). Sand all edges and surfaces smooth, and break the sharp corners slightly.

Now cut out the shelf (B) according to the dimensions given in the cutting list. The overall length of the assembly can be any length you like, but it should be extended in increments of 1-1/2" so the dentil moulding will look right. Of course, the other parts will have to be cut to the same length as well. Rout the moulding profile on the shelf's front edge, and cut the plate groove on the top surface. Next set up the table saw to cut a 3/8" X 3/8" groove on the lower surface with the furthest edge 3/4" from the back edge of the shelf as shown in Figure 1. This groove is to accept the tongue of the hanger strip (C), and it's a good idea to cut the corresponding rabbet in this strip while you've got the dado blade set up. Simply attach a wooden auxiliary fence to the table saw fence, and position it against the blade.

I used a 1/4" core box router bit to mill the plate groove on the top of the shelf, but a simple dado will suffice. Locate and drill the two dowel pin holes in either end. While your router and Roman ogee bit are set up for the moulding, cut the same design on the lower surface of moulding piece (D); then put in a 1/2" round over bit and set the depth to cut the thumbnail profile on moulding piece (E). Since these pieces are rather narrow, it's best to start with wide stock, rout the edges, and then

Bill Bullington *is a semi–retired building contractor in Dyersburg, Tennessee who designs and builds shop tools.*

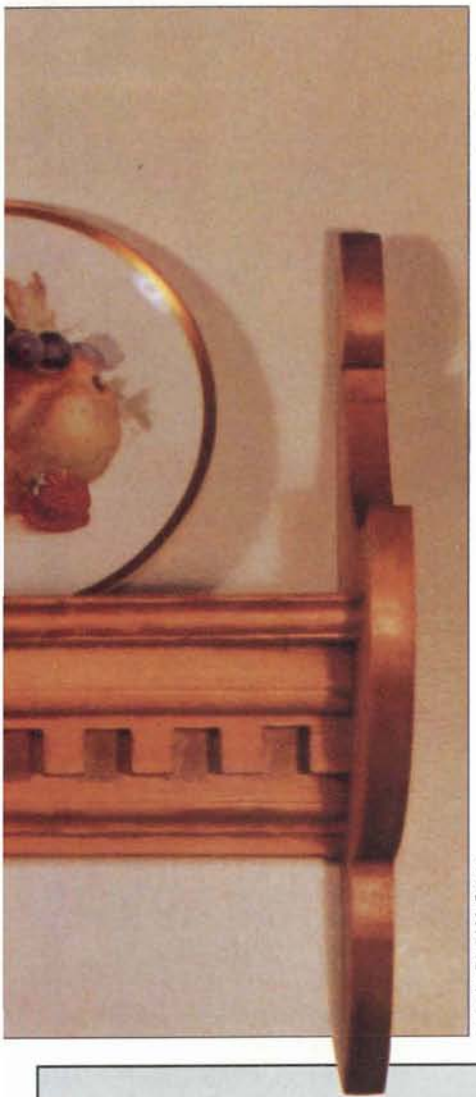


photo by David M. Camp

illustrations by Tom Larson

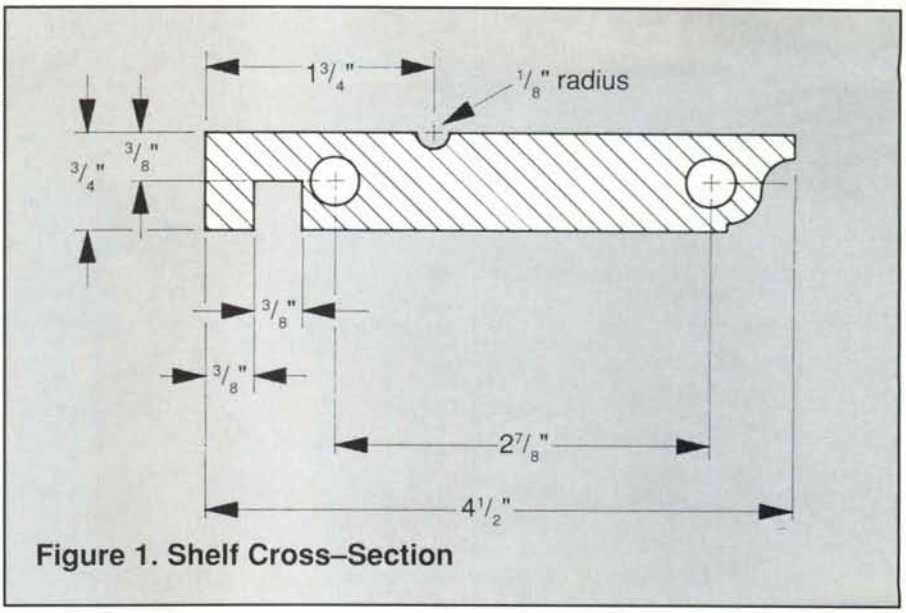


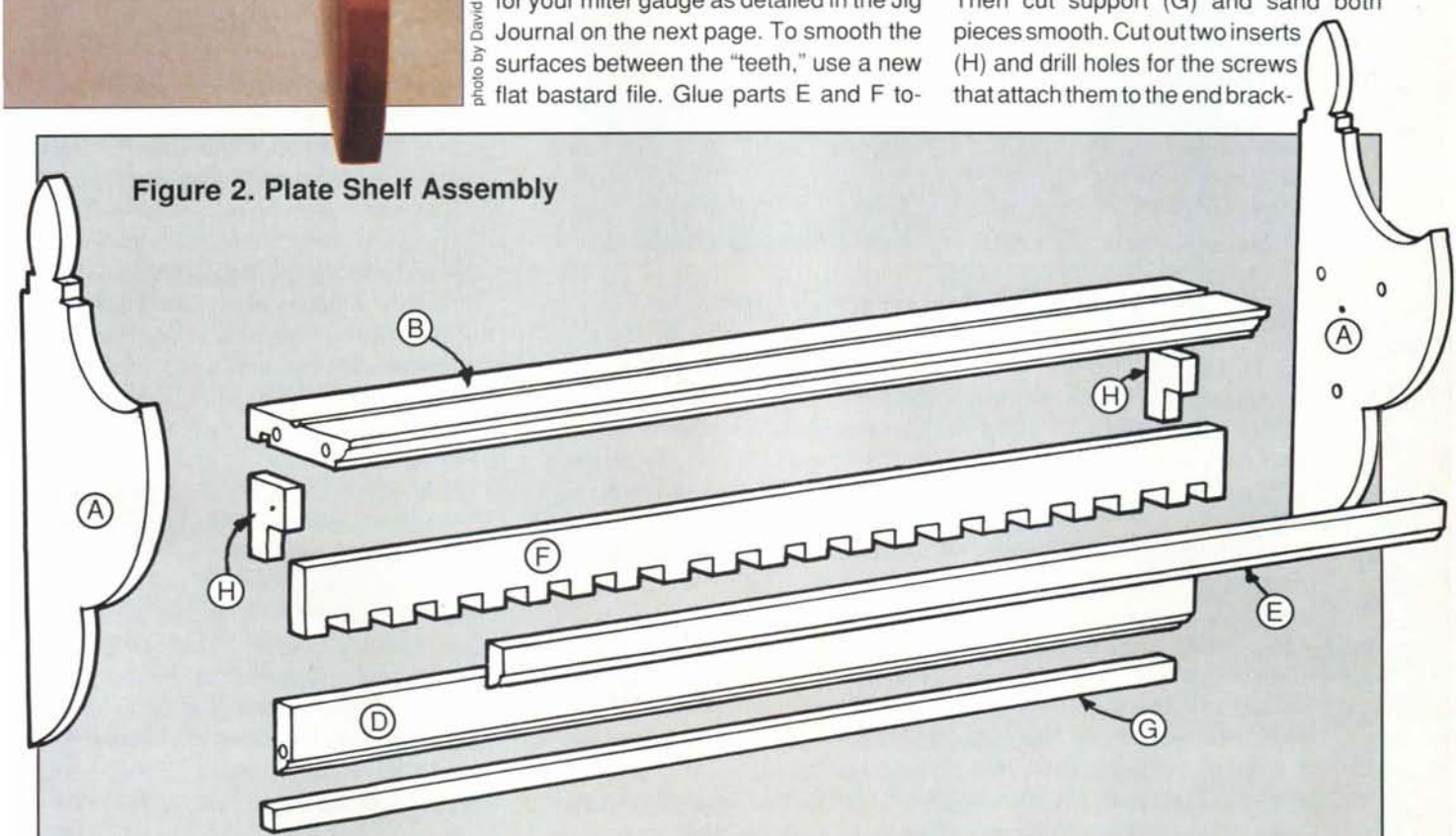
Figure 1. Shelf Cross–Section

rip the pieces to their finished width. When you rout the moulding, cut to within about 1/8" of the finished edge on the first pass. A light final cut will then result in a smoother finish and minimal sanding. This procedure is just good shop practice.

To cut the dentil moulding (F) set up the dado on your table saw to cut 3/4" wide X 3/4" deep and make the referencing jig for your miter gauge as detailed in the Jig Journal on the next page. To smooth the surfaces between the "teeth," use a new flat bastard file. Glue parts E and F together as shown in Figures 2 and 3, being careful not to expel surplus glue onto surfaces that you'll want to finish later. If any glue gets out, wipe it off immediately with a piece of soft cloth dampened in warm water.

Next, take moulding piece (D) which you've already routed, and drill a dowel hole in each end as shown in the Figures. Then cut support (G) and sand both pieces smooth. Cut out two inserts (H) and drill holes for the screws that attach them to the end brack-

Figure 2. Plate Shelf Assembly



see the PullOut™ Plans for a full–size pattern of the end brackets (A)

Plate Rail Shelf					
Cutting List					
		Finished Size			
Qty	Part	T	W	L	Piece
2	A	3/4"	5 3/4"	15 1/8"	brackets
1	B	3/4"	4 1/2"	30 3/4"	shelf
1	C	3/4"	1 1/4"	30"	hanger
1	D	3/4"	1 7/8"	30 3/4"	moulding
1	E	3/4"	1 1/8"	30 3/4"	moulding
1	F	3/4"	2 1/8"	30 3/4"	dentil moulding
2	G	1/2"	1"	30 3/4"	support
1	H	3/4"	1 1/2"	2 1/2"	inserts
Supplies					
6	3/8" diameter X 7/8" dowel pins				
2	1/8" diameter X 1 1/4" wood screws				

Illustration by Tom Larson

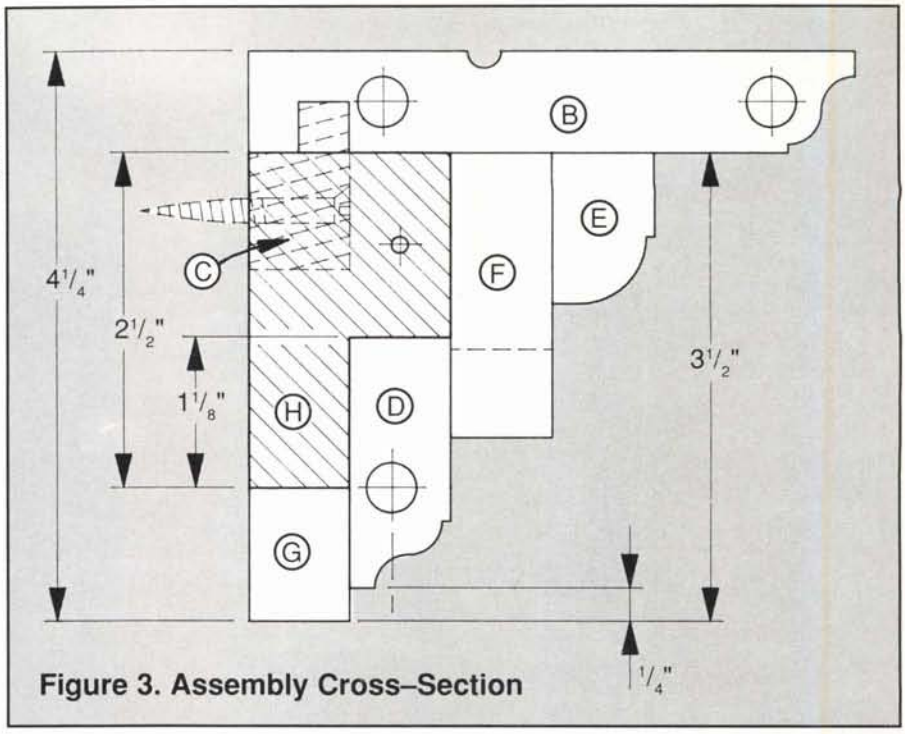


Figure 3. Assembly Cross–Section

Jig Journal

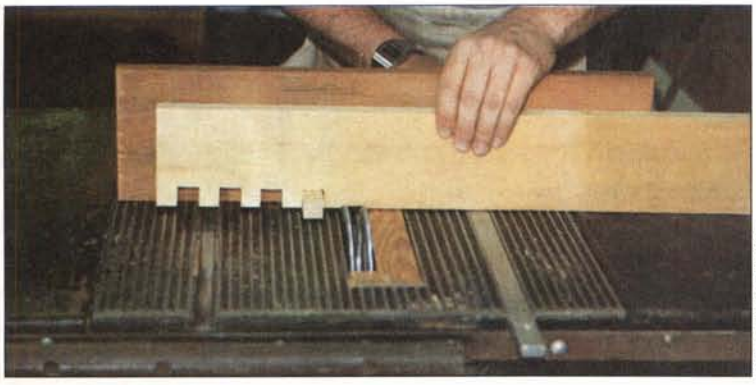


photo by Phil Fischer

Dentil Moulding Jig

by David M. Camp

This jig is similar in principle to jigs for cutting finger joints (see "A Cedar–Lined Pine Chest" in *PW*#52, January 1990). It consists of a wide backup board that has an indexing pin in it, mounted to the miter gauge of the table saw. Size the indexing pin to the width of the space you want between the teeth. In the case of the dentil moulding for this plate shelf project, it should be 3/4". For the trim used on the "Victorian Mailbox Post" on page 32, the dado blade and indexing pin should be 3/8" in width. You can notch the backup board for a square pin using the dado setup you'll use to cut the spaces, or you may find that drilling for a dowel will give you a pin that provides less resistance when sliding the material on and off.

Attach the pin to the backup board with hot–melt glue; then attach the backup board to the miter gauge with the pin located to one side of the blade the distance of the width of the teeth (3/4" for the plate shelf, 1-1/8" for the mailbox post). To use the jig, simply cut the first space at the right point, fit that cut over the pin to reference the next one, and proceed in that manner for the length of the board.

ets (A) as shown in Figure 3. Lay the shelf upside down on a smooth, clean work surface, and align the inserts (H) flush with either end. Position moulding piece (E) and support (F), which you've already glued together, against the shelf and inserts. Check the fit. Apply glue sparingly to the mating surfaces and clamp the parts together. Then fit moulding piece (D) and support (G) into position; glue and clamp them in place. Once the glue has set, lightly sand the entire subassembly.

Finally, dowel and glue the end brackets in place, using six 3/8" X 7/8" (maximum length) dowel pins. Drill pilot holes in the brackets through the screw holes you drilled earlier in the inserts, and draw the brackets together with wood screws inserted from inside.

I finished my shelf with two coats of Minwax® Golden Oak stain and three coats of 3M Wipe–On Poly Finish, followed by a coat of finishing wax. All that remains is to secure the hanger strip to the wall where you want the unit to hang. Screw into the wall studs or use molly anchors if necessary. Then install the shelf assembly over the hanger so that the groove on the underside of the shelf fits down over the tongue on the hanger.

Now you are ready to arrange your best show pieces for display on a fine decorative shelf worthy of their value and interest. PW

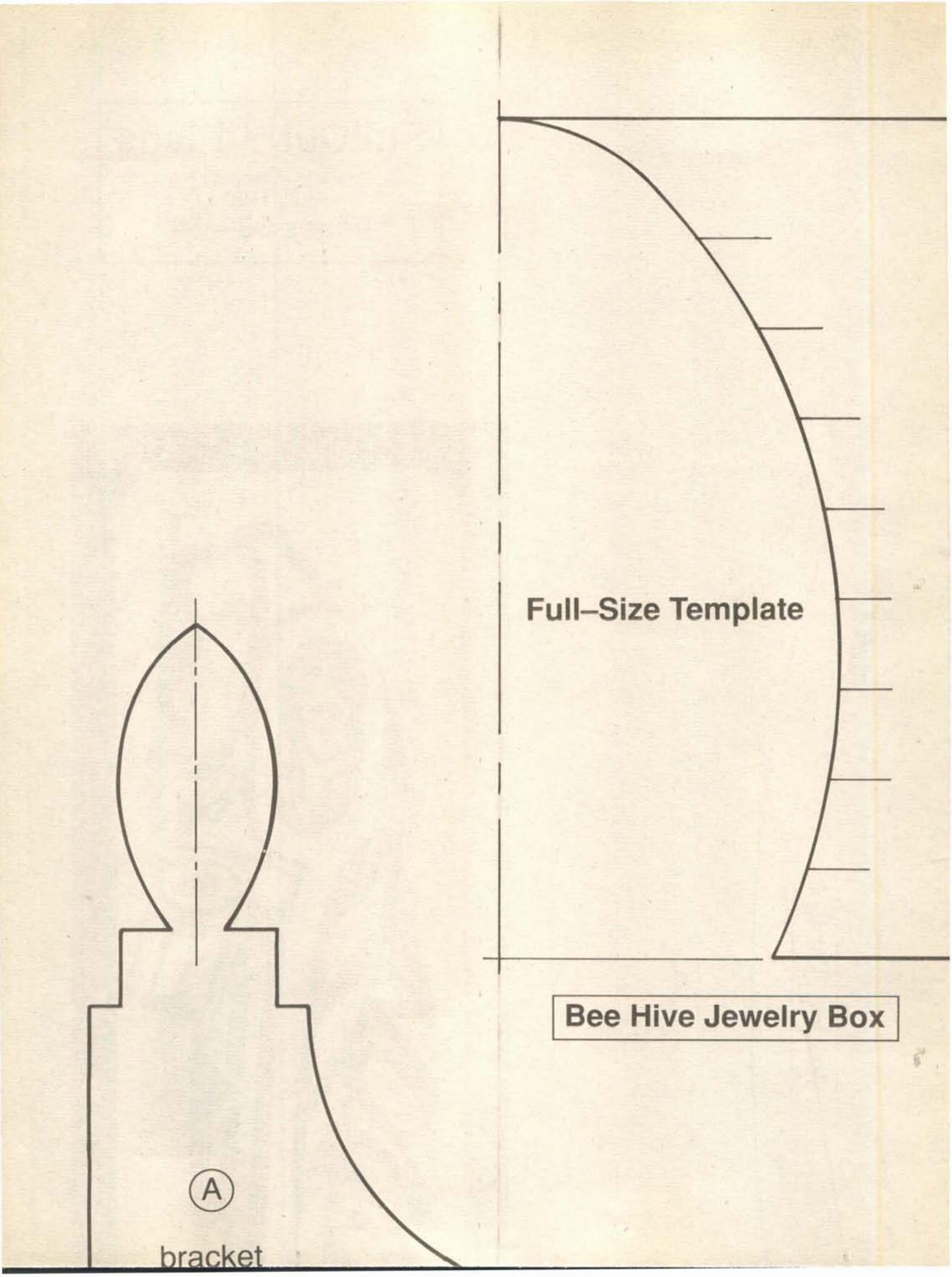
PullOut™ Plans

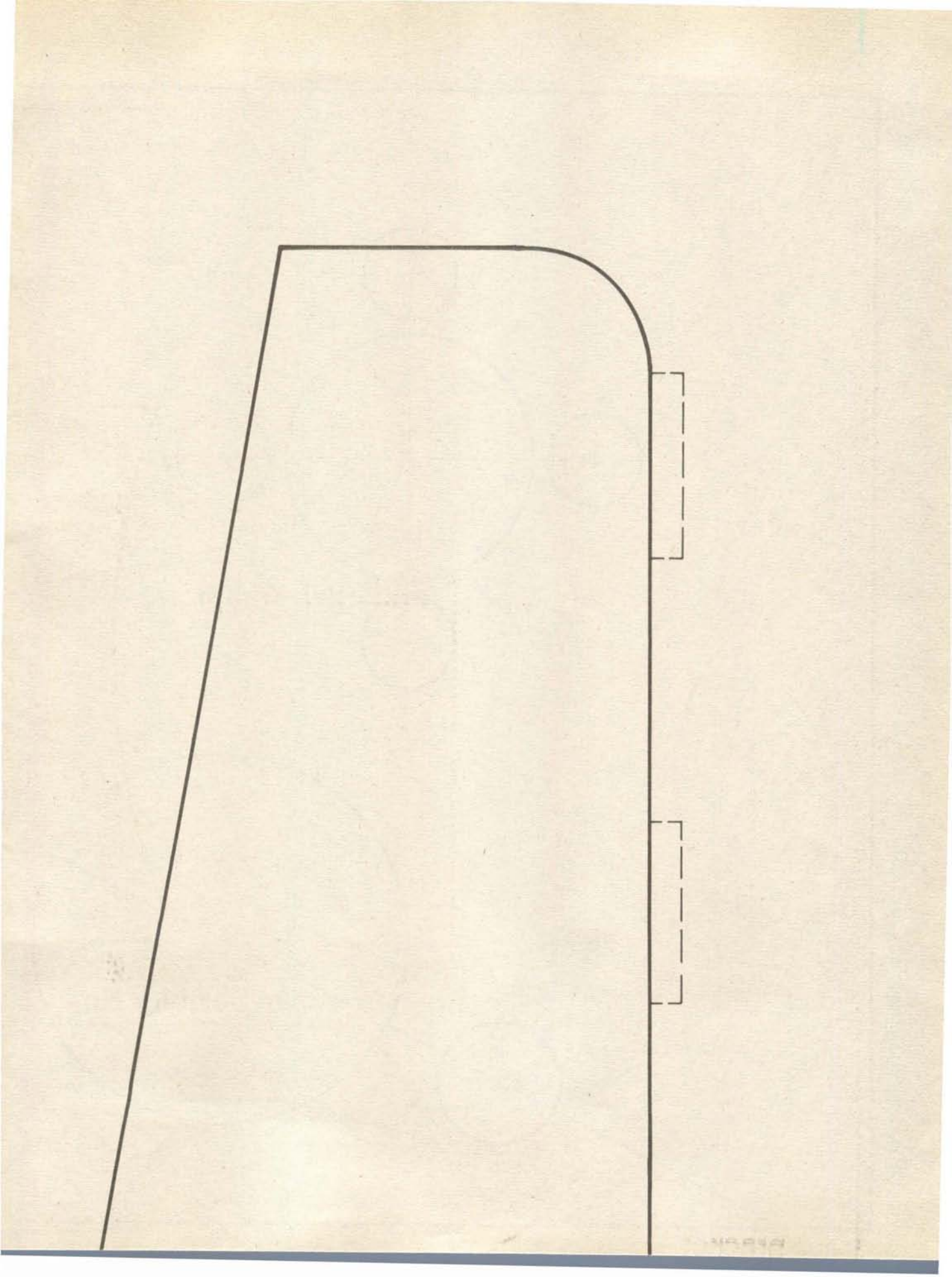
Popular Woodworking #55
July 1990
Pages 39—54

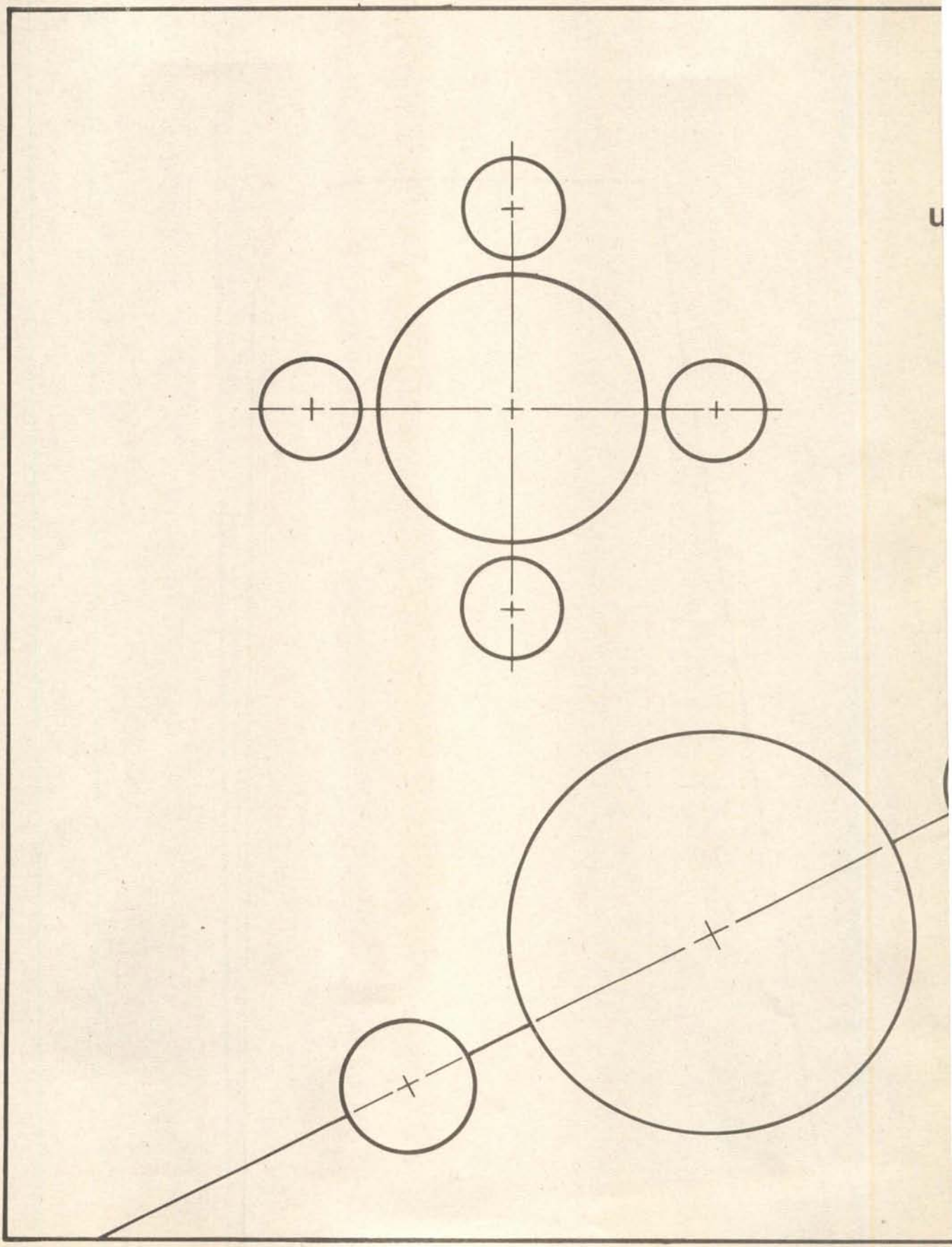
bending jig curved section

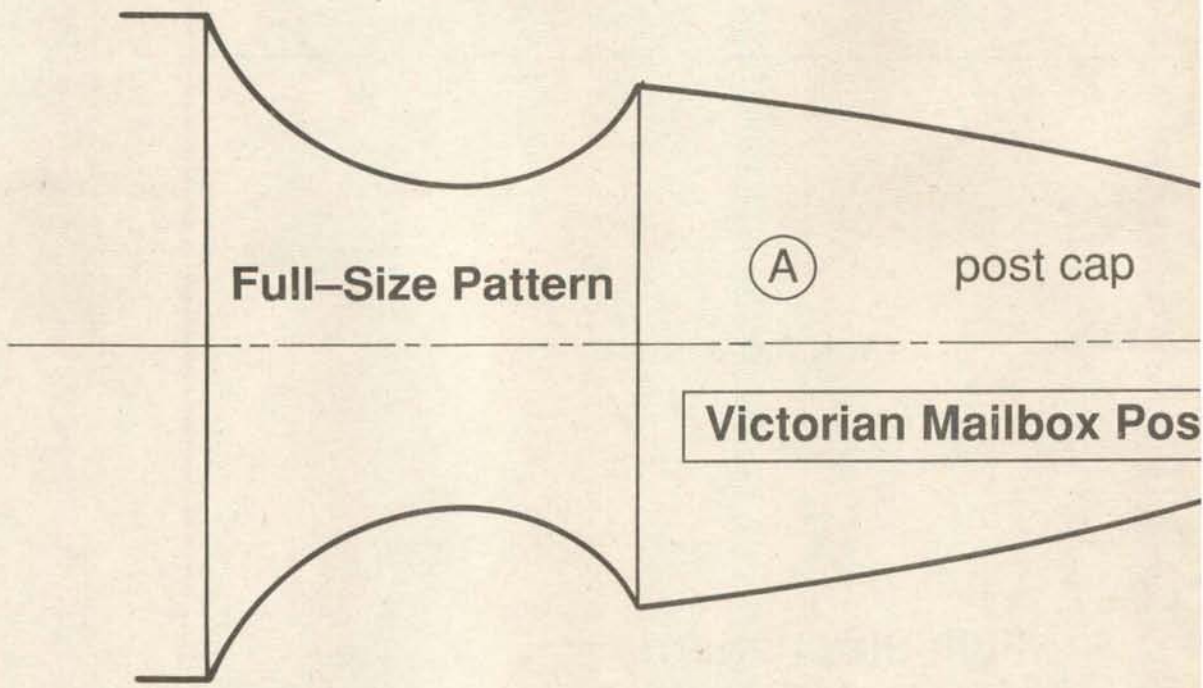
Full–Size Pattern

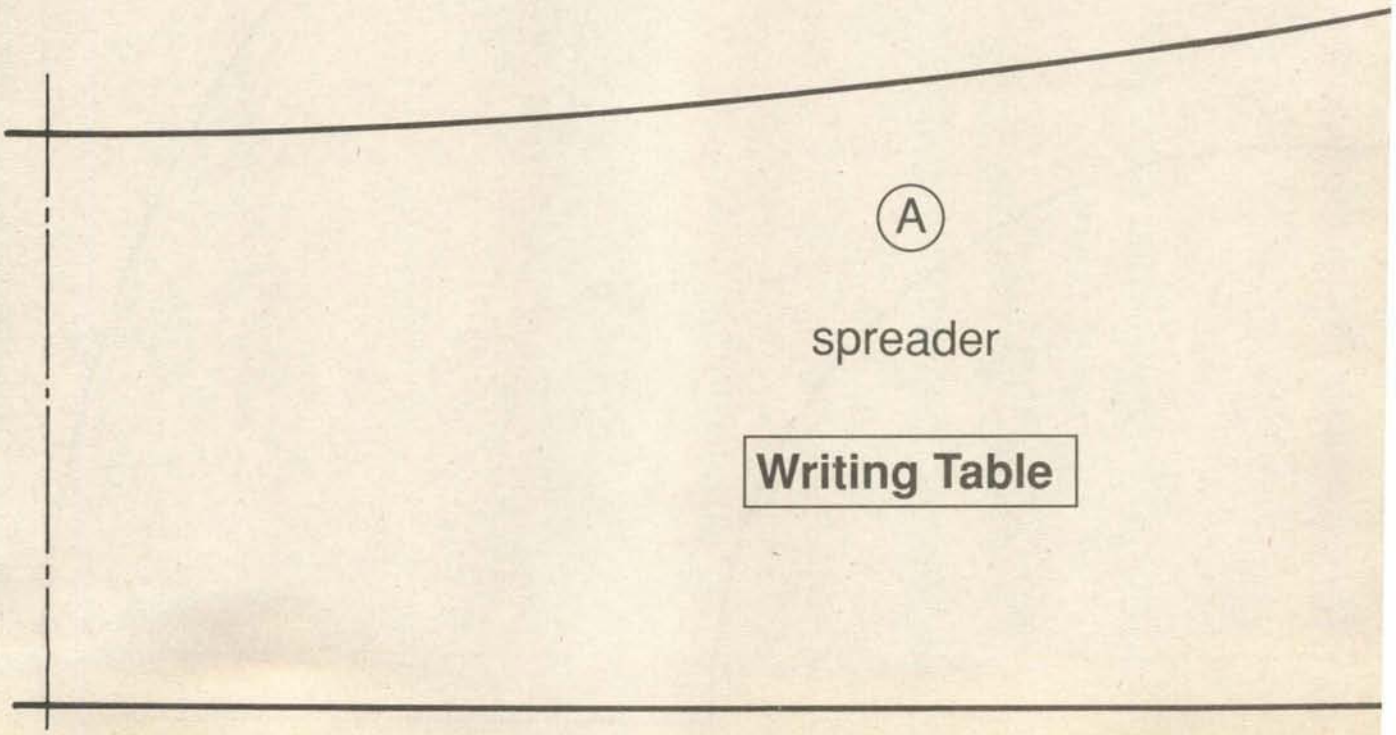
Writing Table


Full–Size Template
Bee Hive Jewelry Box
A
bracket






Full–Size Pattern
A
post cap
Victorian Mailbox Pos


A
spreader
Writing Table

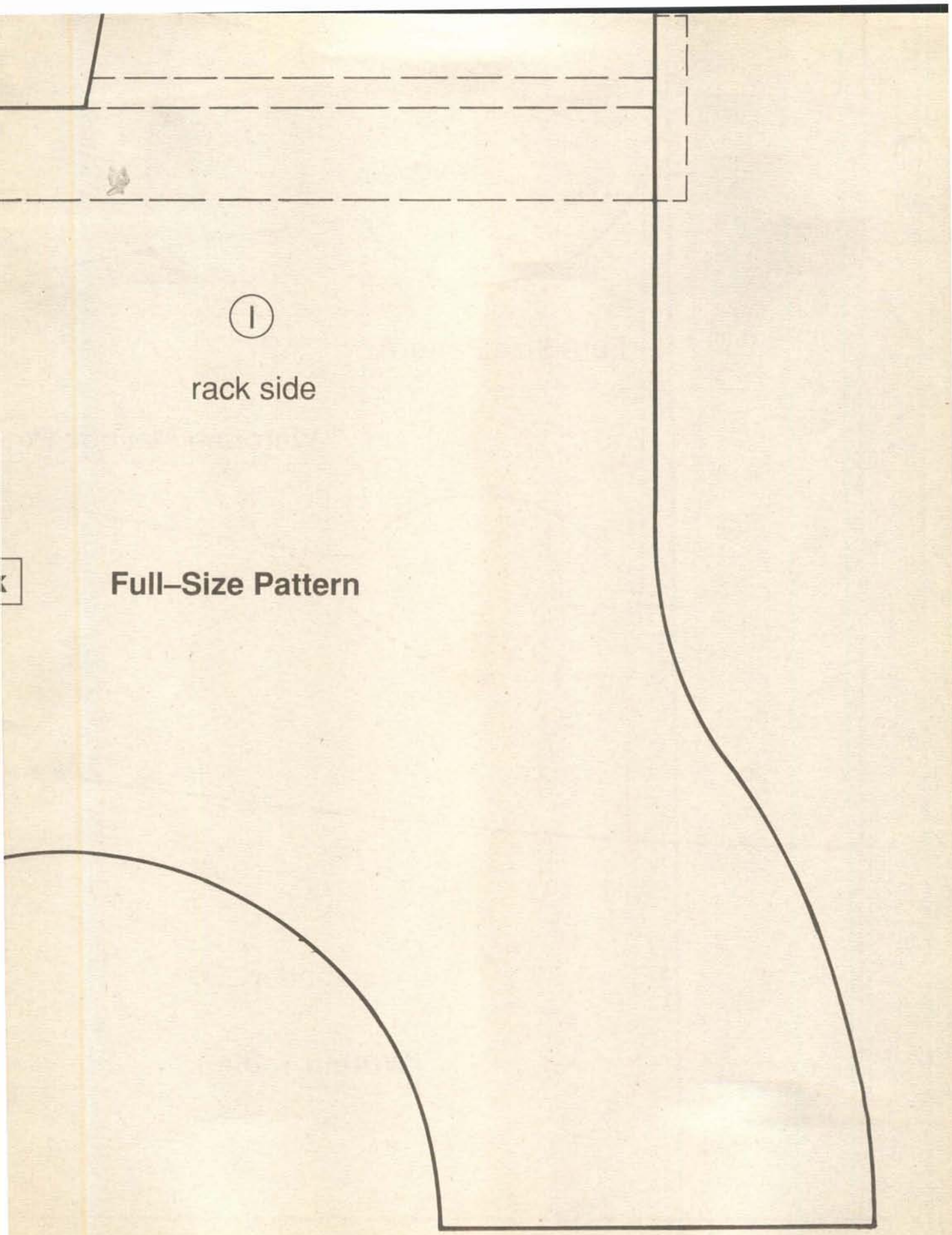
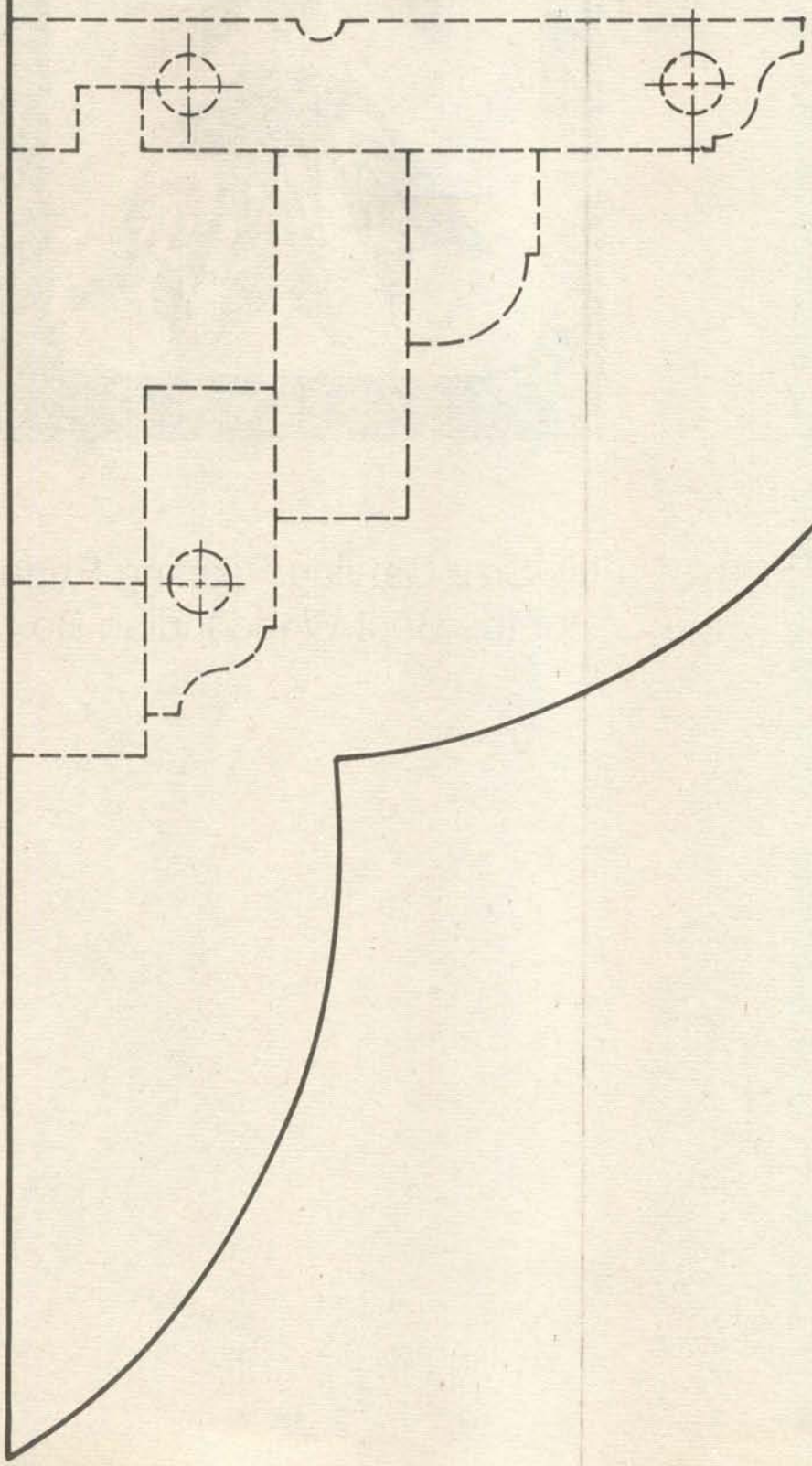

1
rack side
Full–Size Pattern

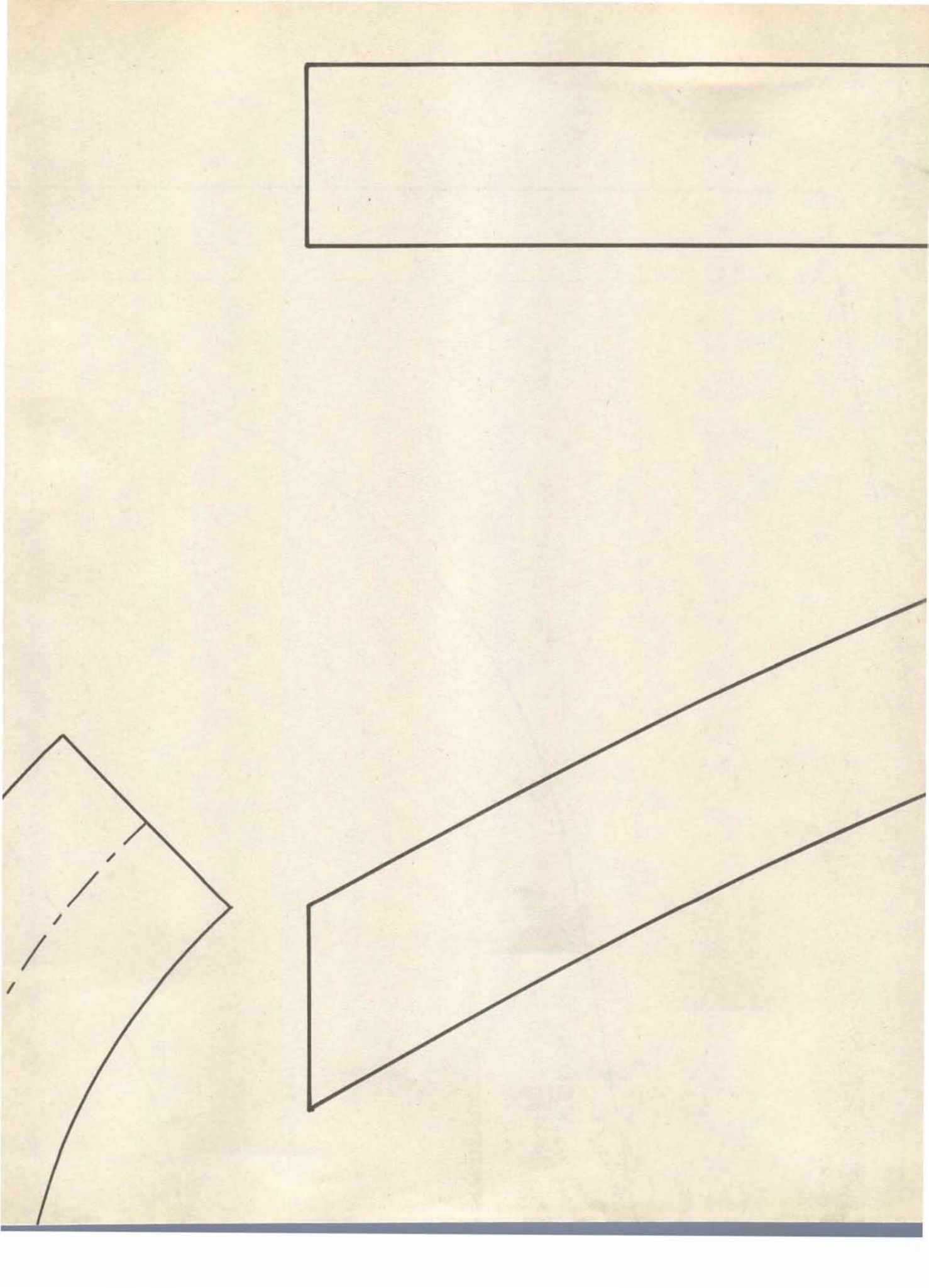
Plate Shelf

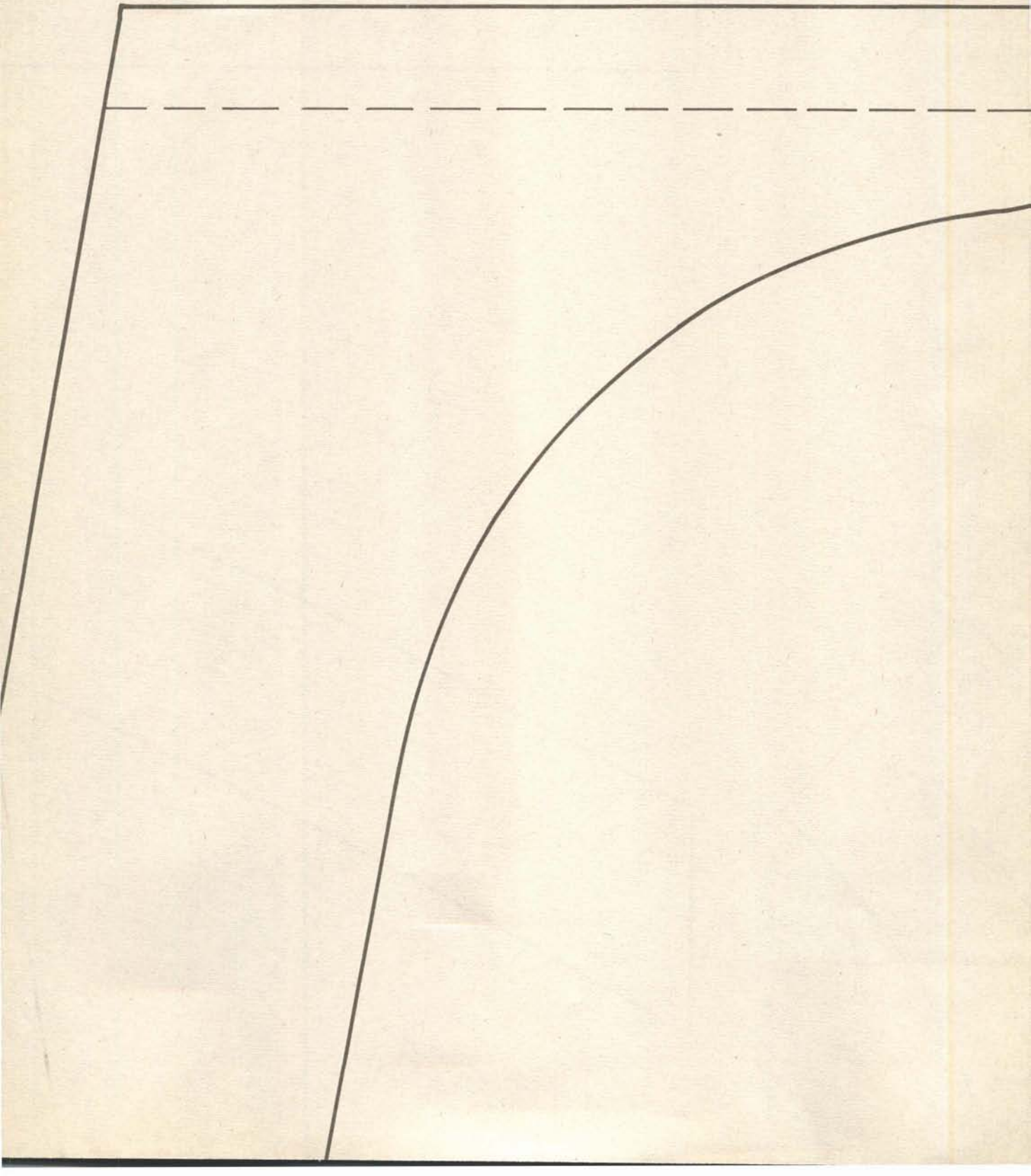
Full–Size Pattern

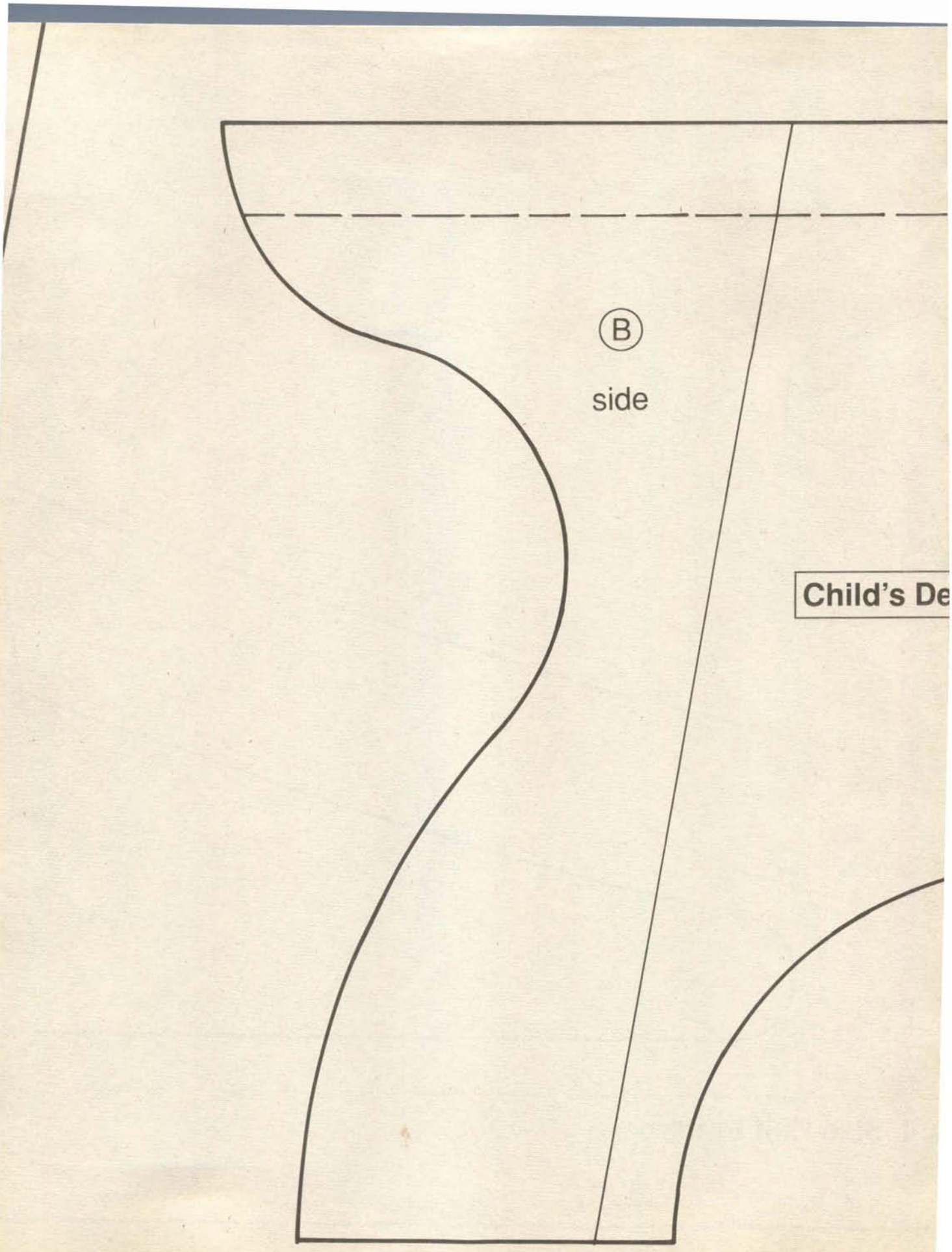


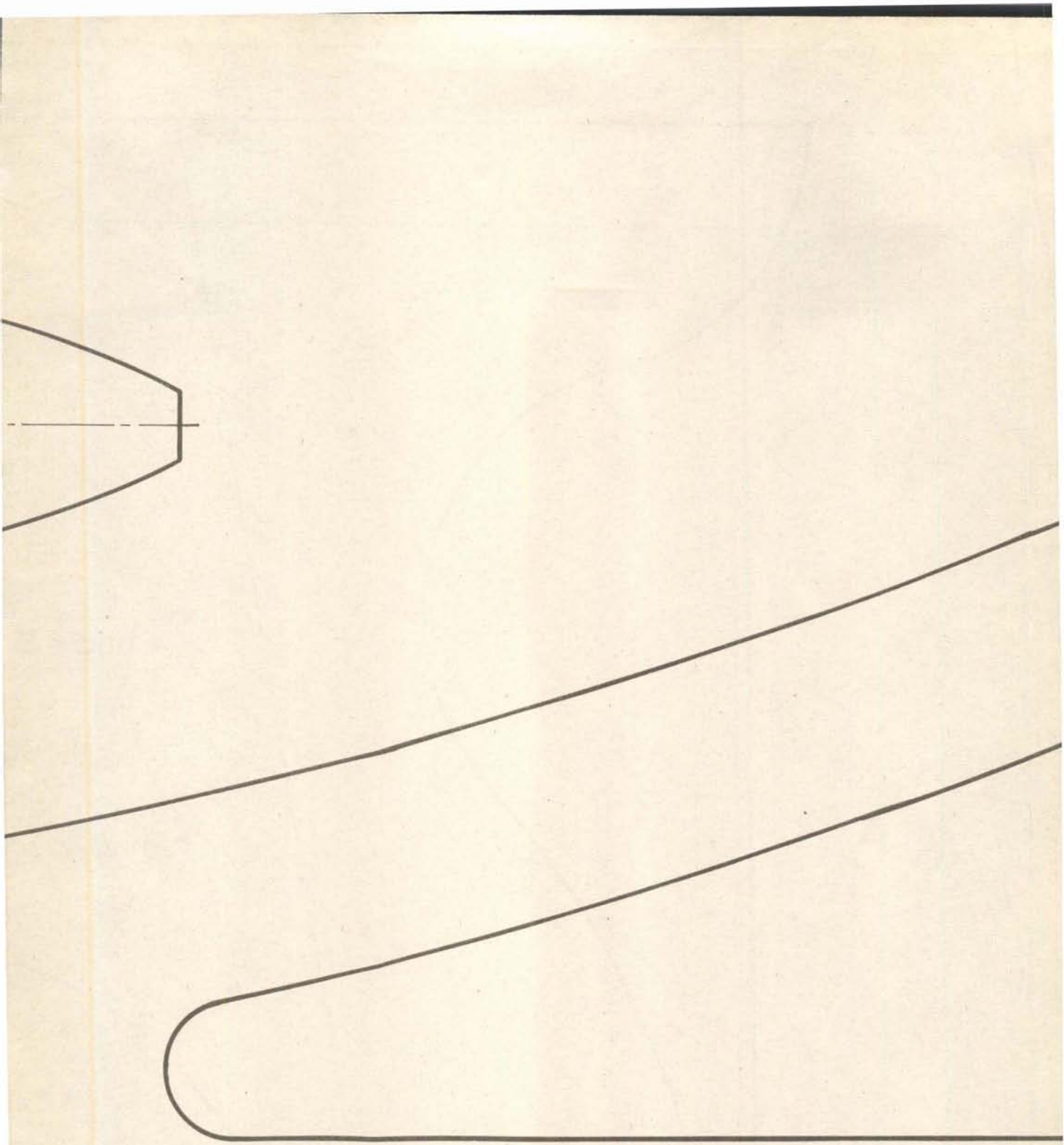
Full–Size Carving/Painting Pattern
for the Bent Wood Indian Box

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





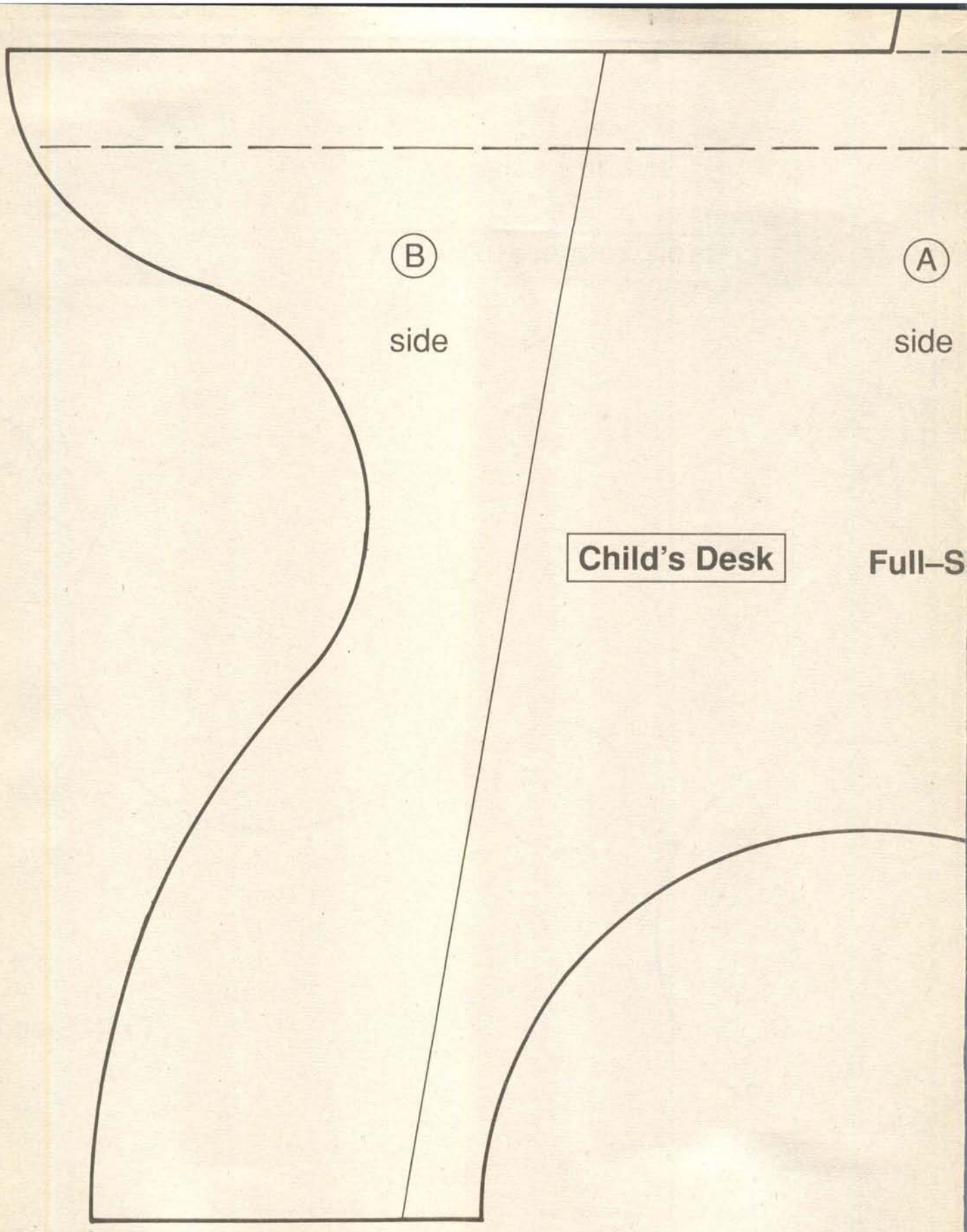

B
side
Child's De

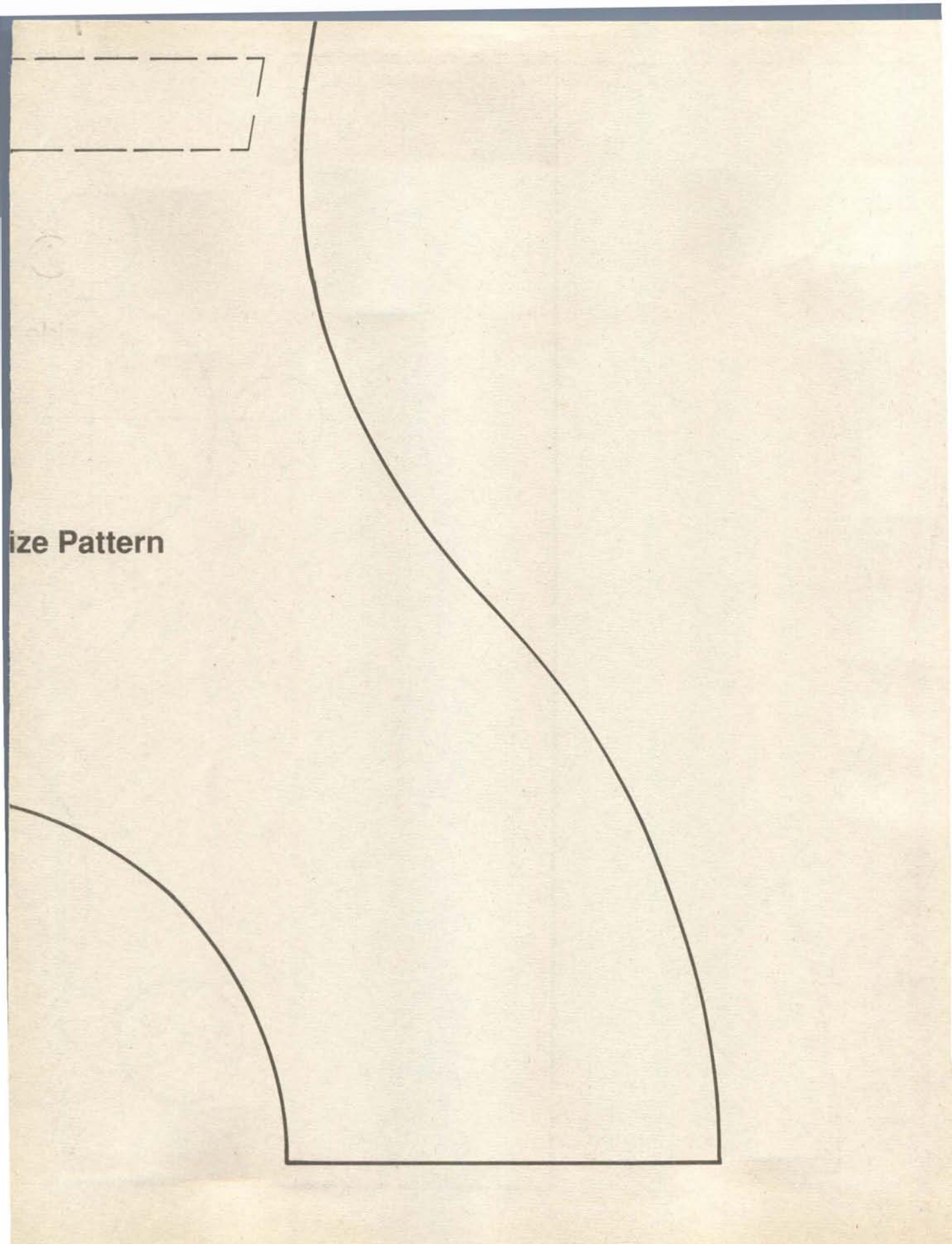


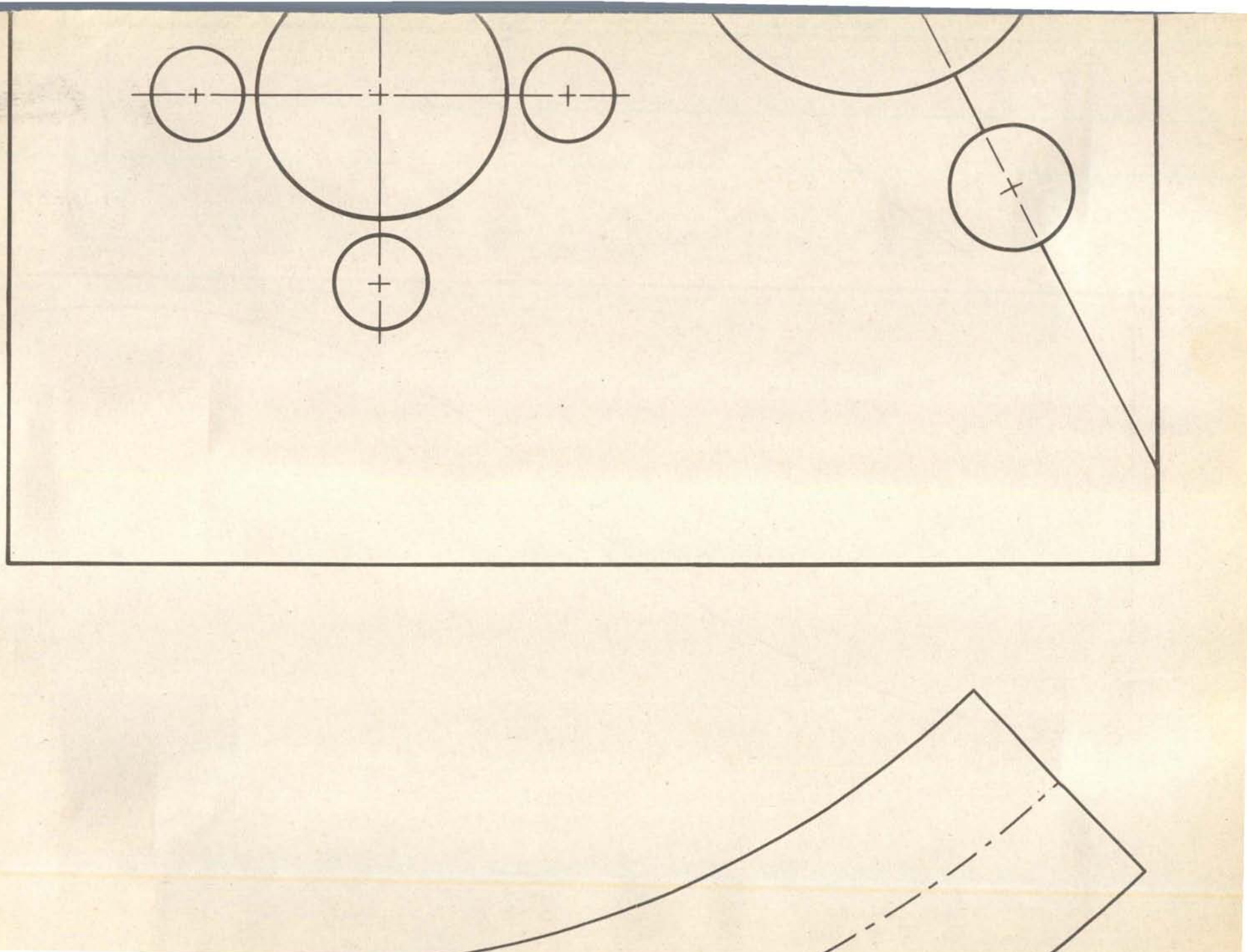
ull–Size Half Pattern

Victorian Mailbox Post

Full–Size Pattern


B
side
A
side
Child's Desk
Full–S


ize Pattern



A Carver's Mallet

by John A. Nelson

Using a regular hammer on your wood chisels will quickly ruin the handles forever. Why take such a chance? This mallet turning project is easy to make and will eliminate the problem.

Your mallet should be made of a very dense hardwood such as maple or oak. The one in the photograph is made of oak because that was the only hardwood blank I had that was large enough at the time I needed a mallet.

Start with a block that is 4" square and about 12" long. The actual mallet will be 9-3/4" long, but you'll need the extra length for mounting between centers. Locate the exact center of each end by drawing a line diagonally across the corners and prick–punch the center with a small nail set. Because of the large size of the block, it is best to trim off the corners with your table saw set at 45°. The resulting octagon will be easier to round to a 3-3/4" diameter.

Mark the 9-3/4" overall length centered in the blank and use a parting tool to cut in about an inch. Now mark off the other diameters shown in the illustration. Turn the mallet to shape, and trim both ends down to a 3/8" diameter nib at each end.

Sand all over and apply a coat of penetrating oil. It's best not to use a hard finish such as polyurethane because it will just chip off as you use your mallet. Remove the mallet from the lathe, and saw off the nibs. Sand the ends and apply another coat of finish.

You will really appreciate your mallet the first time you use it. You might want to make another one with a thinner diameter for lighter work. Make it the same length, but reduce the outside diameter to about 2". PW

John A. Nelson *is a woodworker and drafting instructor from Peterborough, New Hampshire, and the author of* Colonial Classics *(Stackpole Books, Cameron and Kelker Streets, P.O. Box 1831, Harrisburg, PA 17109).*

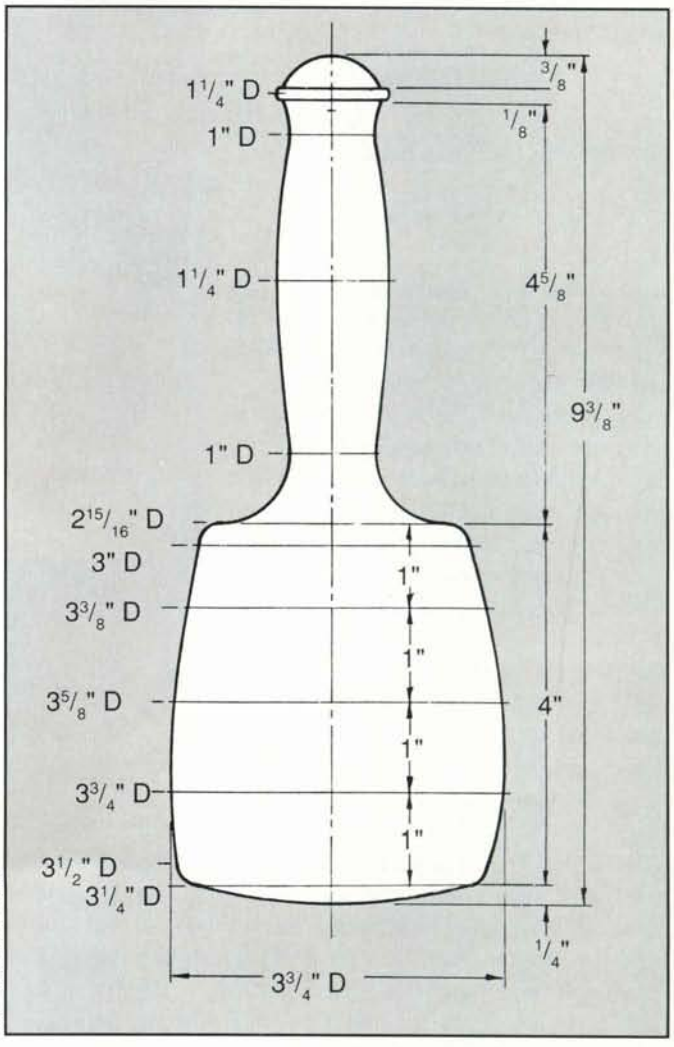


illustration by the author

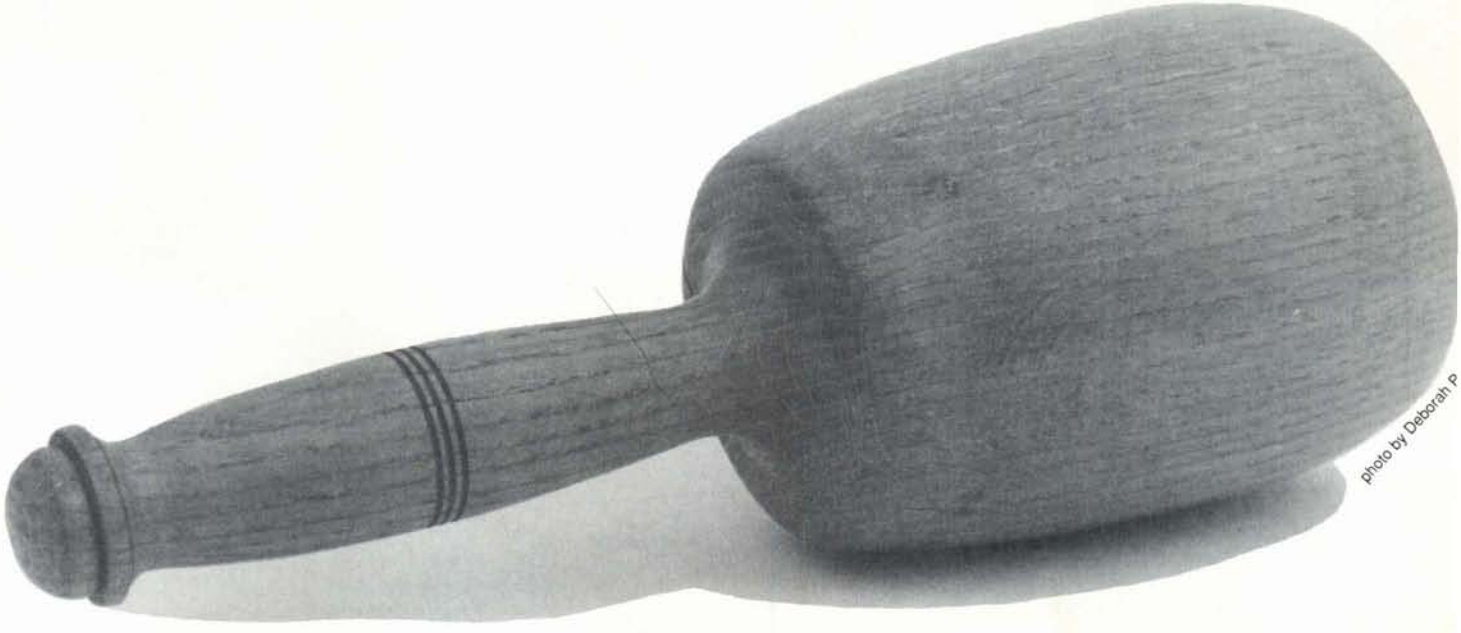


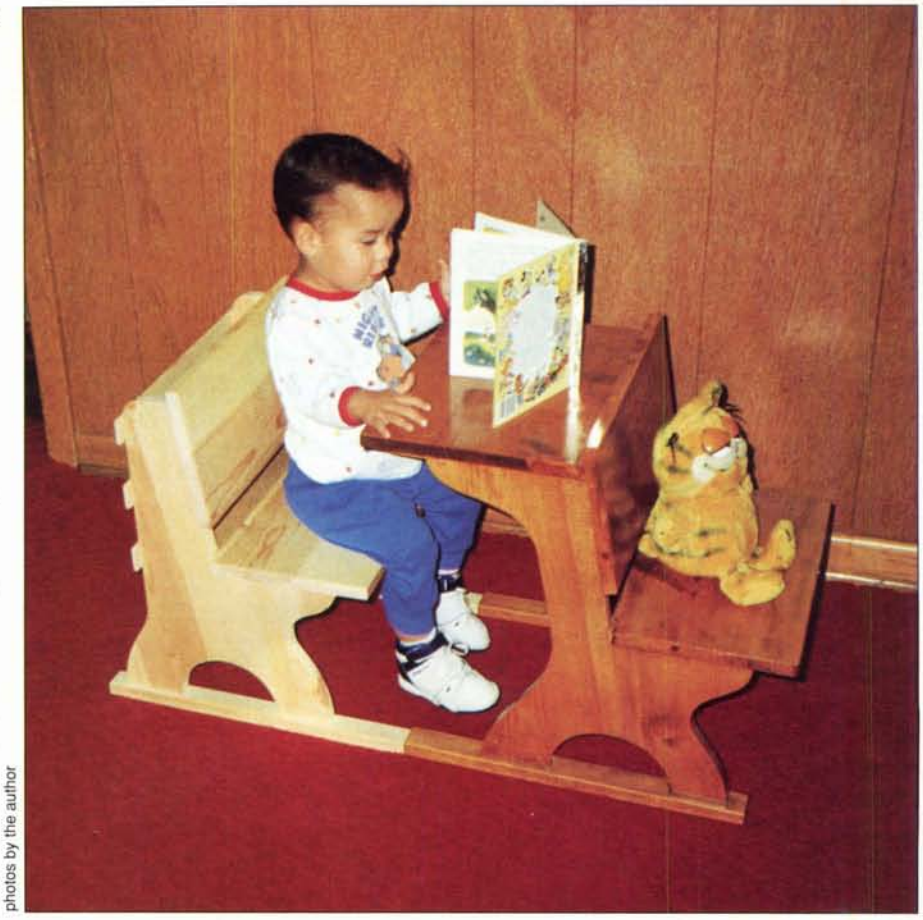
photo by Deborah P

A Popular Woodworking Project

Child's Desk and Magazine Rack

by Howard V. French

These sturdy, versatile desks will fit right in with almost any decor. Children will use them for play, for drawing and reading, and for holding books. They can also serve to display flowers and potted plants. Because the seat of each unit is an integral part of the desk behind it, you can make and link up any number of them. Use the modified seat/magazine rack design to put a "caboose" on your desk "train."



photos by the author

They're made almost entirely from standard 1 X 12 lumber without any special hardware. Begin making the front desk by transferring the pattern for the side pieces (A) and (B) from the PullOut™ Plans (located in the center of the magazine) to 1/8" Masonite®, wall paneling, or even cardboard to make a template. Both parts can then be laid out and cut from the same 20" length of 1 X 12 (Figure 1 and the PullOut™ Plans show how to position them). Cut two of each. Edge glue one A piece and one B piece together along the match lines marked on the PullOut™ Plans to create a complete side piece. Repeat the gluing for the two remaining pieces. Now cut the seat supports (C) and desk top supports (D) as shown in Figure 2. Round and bevel the ends as shown in the Figure, and nail (or screw) and glue them in the positions marked on the PullOut™ Plans.

Cut two base strips (E), center the "legs" of the sides (A–B) on them, and nail and glue them in place. If you want the wood grain to show in the finished assemblies, take care to avoid getting any glue on the exposed exterior surfaces.

While the glue is drying, cut out a desktop (F), a seat back (G), and a seat (H) for each desk you're making. Note that the seat and the desktop each are beveled 10° along one long edge, as shown in Figure 3, in order to meet the angle of the sides and the seat back. Lightly mark a line on the underside of each of these pieces, 3/8" from their ends, to aid in positioning them during assembly.

Begin final assembly of the front desk by placing the seat upside down on the edge of a sturdy, clean work surface. Align a side with the line you drew earlier on the seat. Butt the beveled edge of the seat up against the angled edge of the side (Figure 3) and nail (or screw) and glue it in place. Attach the other side in the same way. Next, place the desktop upside down on the work surface and line it up against the sides as you did with the seat. The beveled edge should be right in line with the same angled side edges now butting against the seat. Finish nail and glue it in place. The unit now assembled will rest steadily upon its base strips.

Finally, fit the seat back in place so that its top edge is 1" above and parallel to the desktop. Pilot drill two finishing nail holes through the upper corners of the seat back into the front edge of the desktop to prevent splitting. You can cut off the head of the nail to be used and chuck it directly in the drill to make the pilot holes. Now temporarily install a nail through each hole and into the top—lightly. Making sure the

Child's Desk & Magazine Rack

Cutting List

Qty	Part	Finished Size T	W	L	Piece
2	A	3/4"	10"	20"	sides
4*	B	3/4"	4 5/8"	10"	sides
2	C	3/4"	1"	11"	seat supports
2	D	3/4"	1"	10 3/4"	desk supports
4*	E	3/4"	1 1/2"	17"†	base strips
1	F	3/4"	11 1/4"	16"	desktop
2*	G	3/4"	8"	16"	seat backs
2*	H	3/4"	9"	16"	seats
2	I	3/4"	10"	20"	rack sides
2	J	3/4"	1"	13"	rack supports
1	K	1/4"	4 11/16"	13 3/4"	rack bottom
3	L	1/4"	1 1/2"	16"	rack slats

*quantity includes parts for both desk and magazine rack assemblies

†length for magazine rack base strips may be extended as indicated in the instructions

Howard V. French *lives in Abilene, Texas, where he spends his time dreaming up woodworking project ideas.*

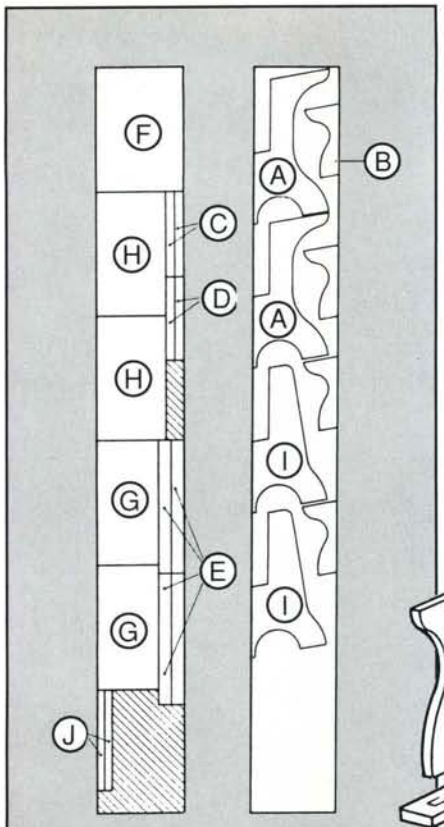


Figure 1. Cutting Diagram

illustrations by Tom Larson

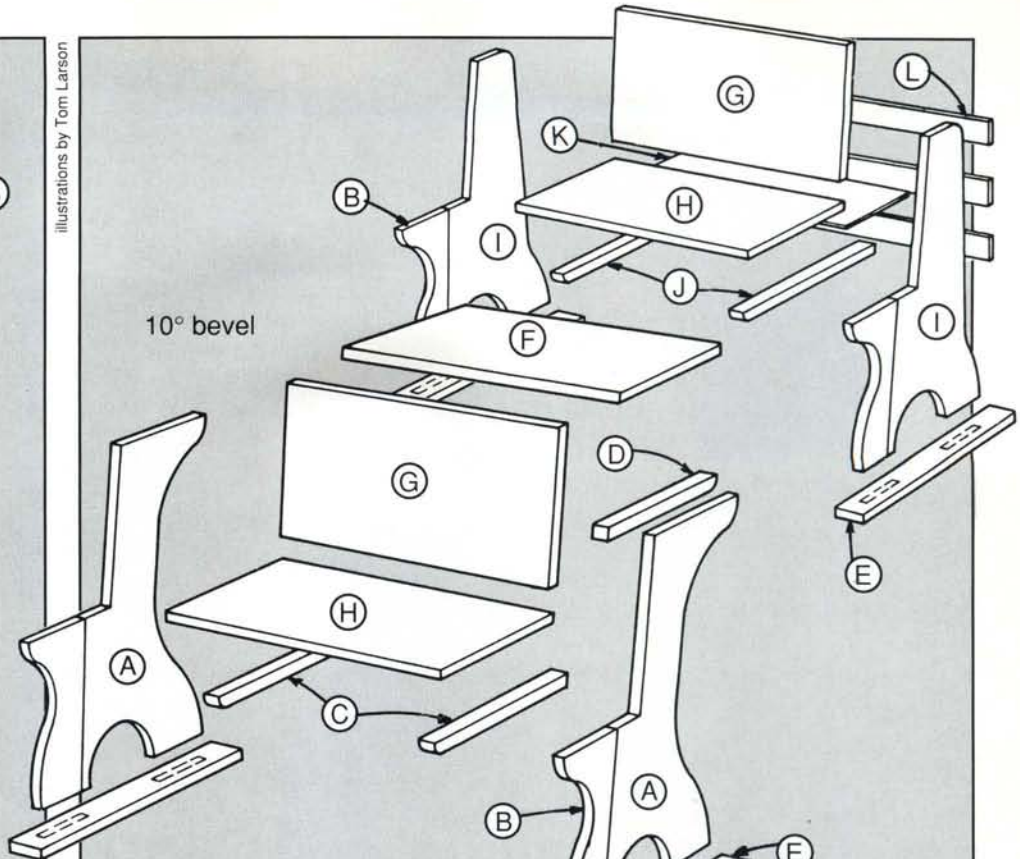


Figure 3. Assembly

seat back is properly positioned, drill two more pilot holes near the lower corners and into the edges of the sides (A). Remove the seat back, spread glue on the mating surfaces, nail it back in position, and set the nails. This final assembly procedure lends great rigidity to the unit.

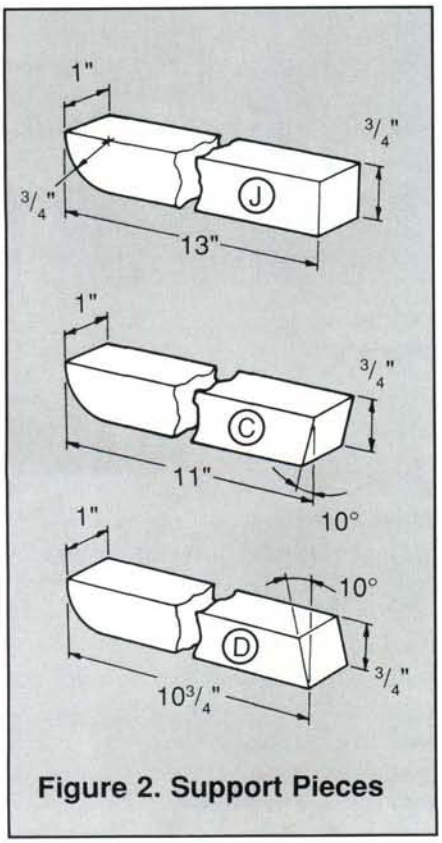


Figure 2. Support Pieces

While you can place two or more of these desk assemblies in tandem, sooner or later the kids will demand a "caboose" on their train. What better way than to utilize the magazine rack design shown in Figure 3? The rack sides (I) are similar to the desk sides (A) except as indicated on the PullOut™ Plan for that piece, while the B side pieces are the same. The assembly procedure is also similar, except for the changes described below.

After gluing together sides (I) and (B), nail (or screw) and glue the seat/rack supports (J) into position so that their back ends are flush with the back surfaces of sides (I) as shown in Figure 3. As you install the supports, be sure to make a left– and a right–hand subassembly. Join these subassemblies by nailing and gluing the seat (H) and seat back (G) in position as described earlier.

Now position the rack bottom (K) so that it rests on supports (J) and its 10° beveled edge butts against the rear beveled edge of the seat. Sprig (nail with a small headless brad) and glue it in place. Next, install the three rack slats (L) in the same way.

If you want the magazine rack configuration to stand alone, attach the two base strips (E) exactly as described for the desk configuration. Or you can extend them so they butt the rear ends of the desk base strips. Just leave sufficient room for children to slide into and out of the seat. Another variation is to make the base pieces on either side continuous, integral units. As you can see in the photo, I used a clear finish on the units to permit the natural beauty of the wood to show. You might want to enamel them brightly, especially if they'll be part of a child's room. PW

David M. Camp

Bee Hive Jewelry Box

by Devore O. Burch

Several years ago my daughter showed me a magazine advertisement for cosmetics in a plastic container shaped like a bee hive. She said, "Daddy, you could make this out of wood and it would make a neat jewelry box." After three or four prototypes, here's what developed. Though it scarcely resembles the original plastic cosmetic container, it has proven very popular with the ladies. Some men even buy them for gifts.

***Devore O. Burch** is a woodworker in Fort Worth, Texas.*

I have made these jewelry boxes from all types of hardwoods—teak, rosewood, walnut, Honduras mahogany, ponderosa pine, and combinations of walnut and vermillion (as in the photo on page 4). Any wood will work, but avoid knots and imperfections. Honduras mahogany is an excellent choice, because it's a stable, straight–grained wood and takes an excellent finish.

A rough block size of 6" X 6" X 10" will make all four components with allowance for saw cuts and excess on the upper end of the top section. A solid block of this size is not necessary—as any woodworker knows, solid blocks of this size are scarce and very expensive. The rough block can be glued up from 1" or 3/4" stock or whatever you have. Here is a chance to use up some remnants. You could get fancy and laminate a blank from mixed species for an interesting color pattern.

After the block is prepared, square up the ends and rip the corners off at 45° to make it octagonal so you'll have less

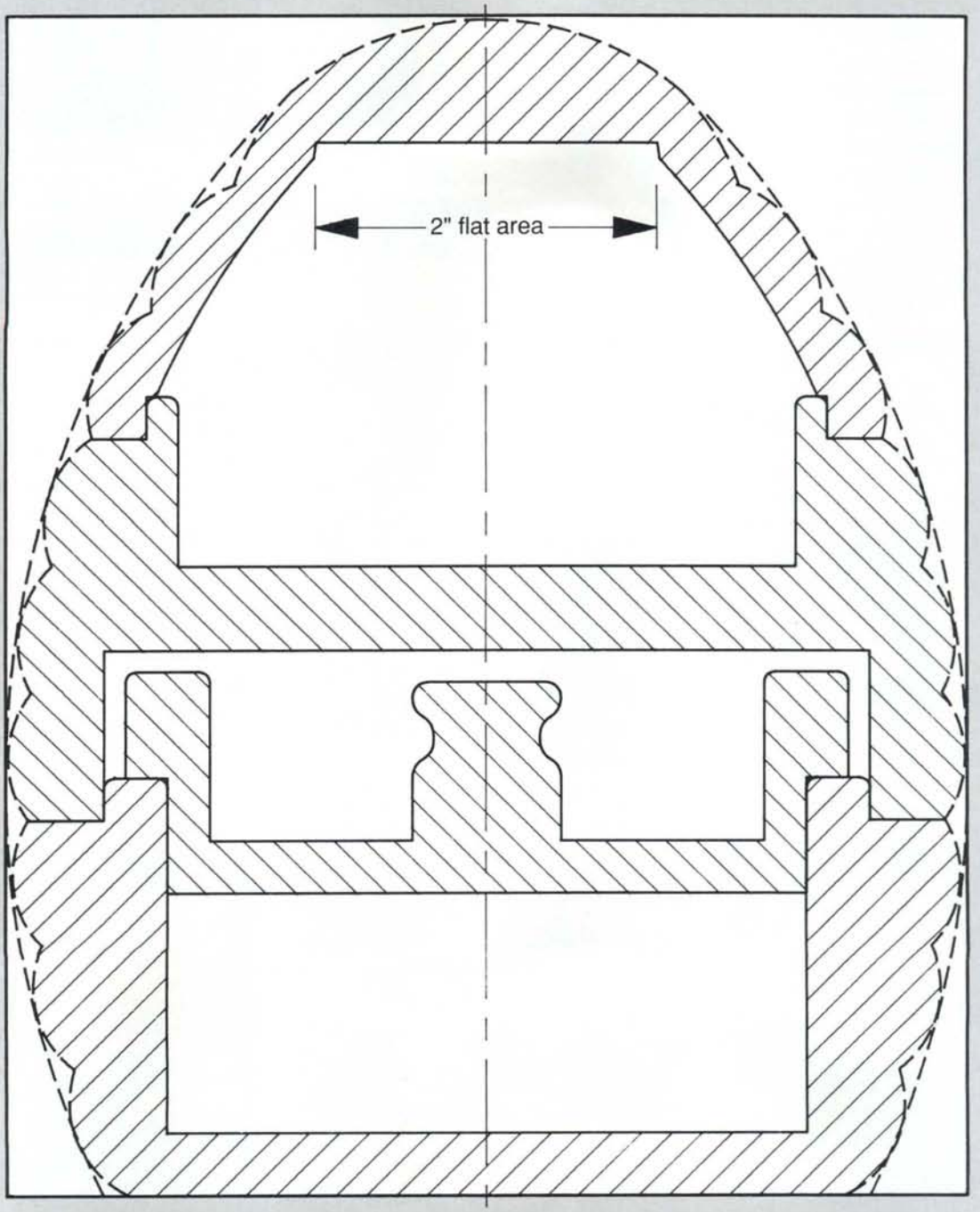
rough turning to do. Mount it in the lathe and turn the block into a 6" diameter cylinder.

The jewel case is composed of four components: base section, mid section, top section and ring tray. After turning the cylinder, the next step is to cut the components to length on the table saw. Since the blade won't raise high enough to cut through it all in one pass, I clamp a stop block to the fence (well back from the blade) to set the length. I screw a wide board to the stock of the miter gauge so I can clamp the cylinder to it (see the photo on the following page). I make one pass, loosen the clamp, rotate the cylinder some, reference it against the stop block, clamp it, and make another pass until I've sliced all the way through. Cut the ring tray section first at 1-1/4" long; then cut the other three sections to a length of 2-1/2".

Start the turning by mounting a face plate on one of the 2-1/2" long pieces. This will be the base. Mount it on the lathe and turn the inside cavity and the lip around the rim only (see Figure 1). Do not turn the outside profile at this point. Figure 1 is drawn full–size, so simply use your dividers, calipers and scale to transfer the dimensions directly from the drawing to

illustrations by Tom Larson

Figure 1. Full–Size Cross–Section

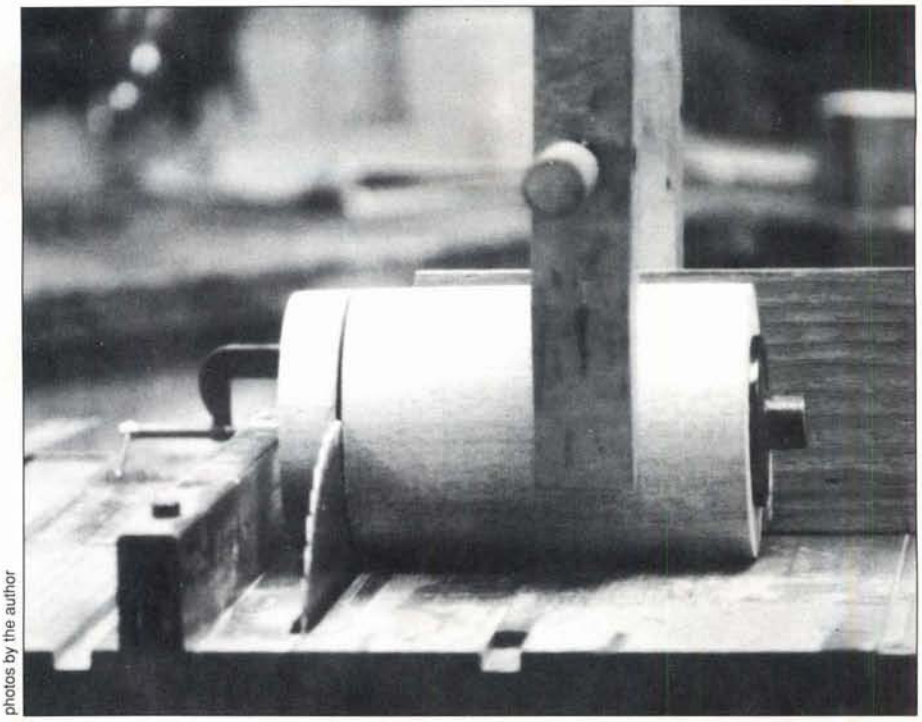


the work being turned.

After the inside cavity of the base is turned, sand it completely and set it aside. Now mount a face plate on another 2-1/2" block and turn one end to fit over the rim you cut on the base section. Cut squarely into this mid section to a depth of about 1". The fit should be a slip fit, not so loose as to be sloppy, but free enough to allow for seasonal expansion of the wood. It is very important that all the components mate together. Dimensions are secondary.

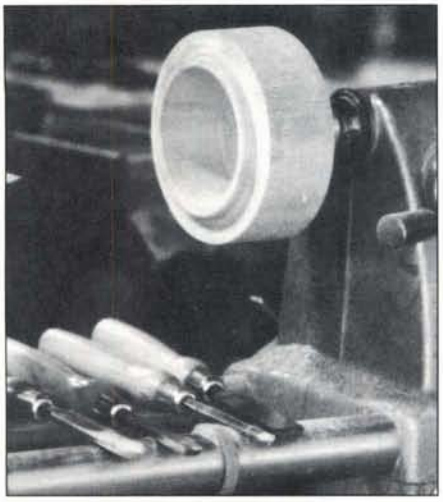
While the part is still on the lathe, bore a 1/8" hole dead center all the way through. This hole is to index the center for turning the upper end of the mid section. This is the trickiest part in making the jewelry box. The cavities on both sides of the mid section must be concentric (see Figure 1). Again, do not turn the outside profile at this point. Sand the inside completely before removing the mid section from the lathe.

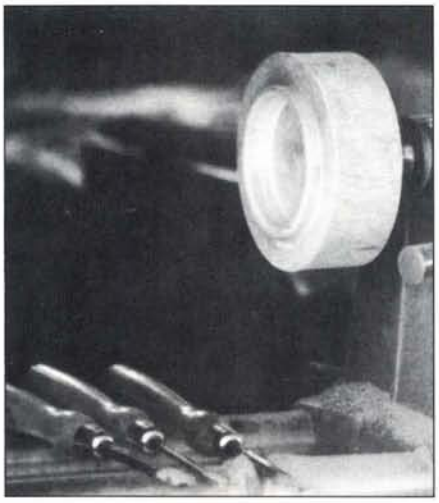
Now mount a face plate on the remaining 2-1/2" block and turn the cavity to fit over the lip on the upper end of the mid section. Hollow down to a 2" diameter flat area inside the top section (see Figure 1), and sand completely.



photos by the author

Use a stop block to reference each pass of the cylinder as you slice it into the various parts of the bee hive.Clamp the cylinder to a wide auxiliary fence on the miter gauge for each pass.

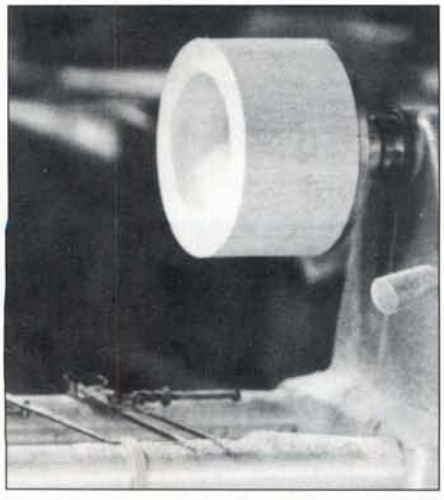


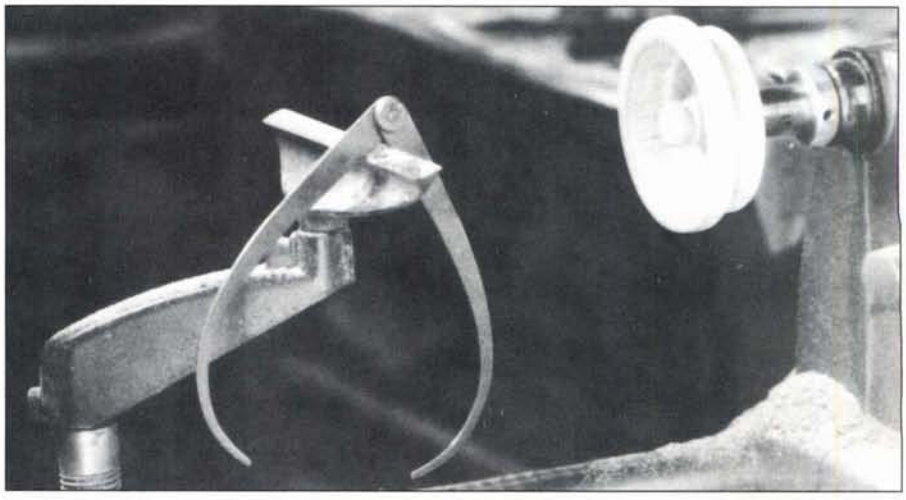


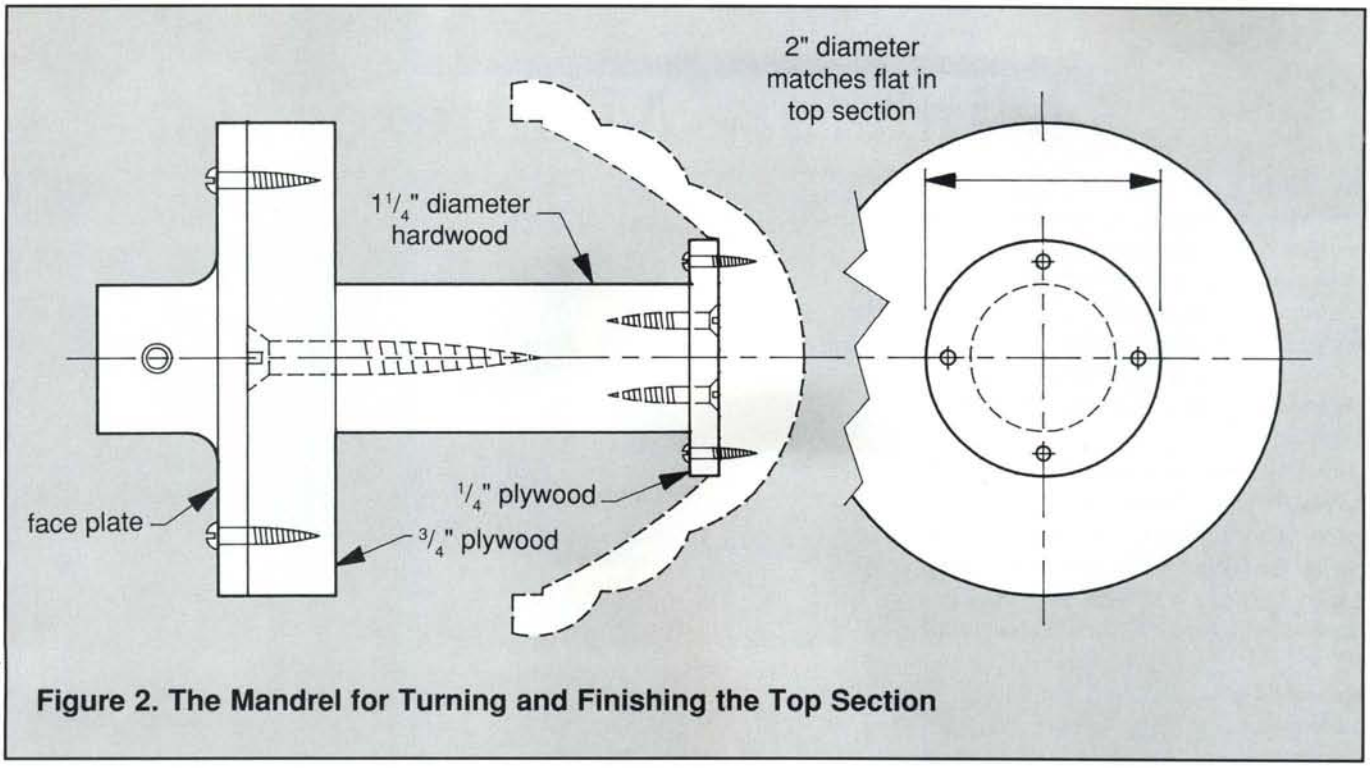
Now that the inside turning is completed on these three components, mount the face plate on the base, assemble the three pieces, and put them back on the lathe as a unit. Center the lathe's dead center against the top section and apply sufficient pressure to hold the three components together as one piece.

Now you are ready to turn the outside profile. Make a cardboard template traced from the full–size pattern in the PullOut™

Rather than worry about dimensions, turn the pieces so they fit together.
The rim on the bottom section (above left) must fit into the middle section. The rim on the middle section (above right) must fit into the top section (below left). The ring tray (below right) has to be able to fit between both the bottom and middle section.







Illustrations by Tom Larson

Figure 2. The Mandrel for Turning and Finishing the Top Section

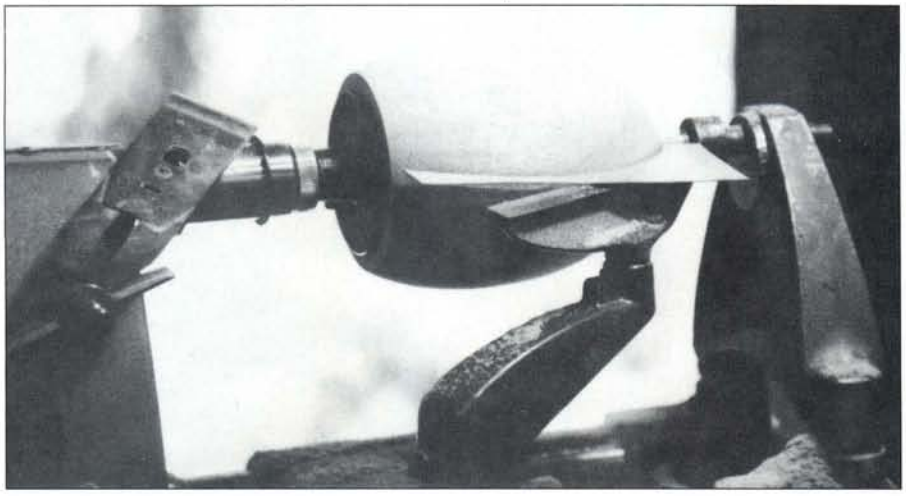
Plans section in the center of the magazine. I like to use a plane iron instead of a regular turning tool for shaping the outside into a smooth flowing contour. Note that a small amount on the upper end against the dead center cannot be completed just yet.

After you are satisfied with the shape of the basic profile, transfer the marks for the low points of the scallops with a pencil. Incise the marks with a sharp skew chisel, then finish shaping the scallops with the same tool. The low points of the scallops must coincide exactly with the parting lines where the components mate. This makes the bee hive look like a solid block when assembled. After the scallops are shaped, sand completely with fine 400-grit sandpaper.

The base and mid section are now turned completely and may be removed from the lathe. The small area on the end of the top section may be shaped by hand, but a better method is to make the holding fixture shown in Figure 2. This fixture is also very useful for applying the finish. If you use it, mount the top section with the 2" flat section as the attaching surface using #4 X 3/4" round head wood screws.

Turn the ring tray on a screw center. Mount it on the lathe and turn it to mate with the base unit as shown in Figure 1.

Fit all the pieces together between lathe centers and turn the assembly to the rough shape of the hive before incising the scallops. Use the template in the PullOut™ Plans section to check the profile and mark the scallops. The author uses a plane iron to smooth the shape.



The components should be finished while mounted on the face plates or fixtures they were turned on. If you used mahogany as I did, stain with a red mahogany non-grain-raising (NGR) stain. NGR stains are available by mail from Craftsman Wood Service Co., 1735 W. Cortland Ct., Addison, Illinois 60101. You can use any of a variety of wood finishes, but here is one from the old school which is still unexcelled in beauty and durability.

After the stain is dry, apply a coat of paste wood filler and wipe it off with burlap after it dulls in appearance. Polish with a clean cloth. When the filler has cured, apply two coats of sanding sealer, polishing between coats with fine steel wool. Next, apply two or three coats of brushing lacquer such as Deft®. Polish between coats with 6/0 steel wool. After the final coat, polish with fine pumice and oil, then rottenstone and rubbing oil. Finally, apply a coat of good paste wax and buff to a high gloss. This will create a beautiful, lustrous finish.

For the final touches remove the face plates and plug the screw holes. Then touch up the areas with finish to match the surrounding finish. Cover the bottom of the base with felt to give a scuff-free surface. The 2" diameter flat area inside the top section may be fitted with a 2" engraved brass plate if you like. PW

Miniature Mailboxes

by Alice and Robert Tupper

Here's a nifty little gift item that's easy and fun to mass produce. These miniature mailboxes are a great way to send a *message*. Cards are often thrown away, but a love note or get well message that's folded up inside a mini mailbox is sure to be cherished. And they sell very well at crafts fairs.

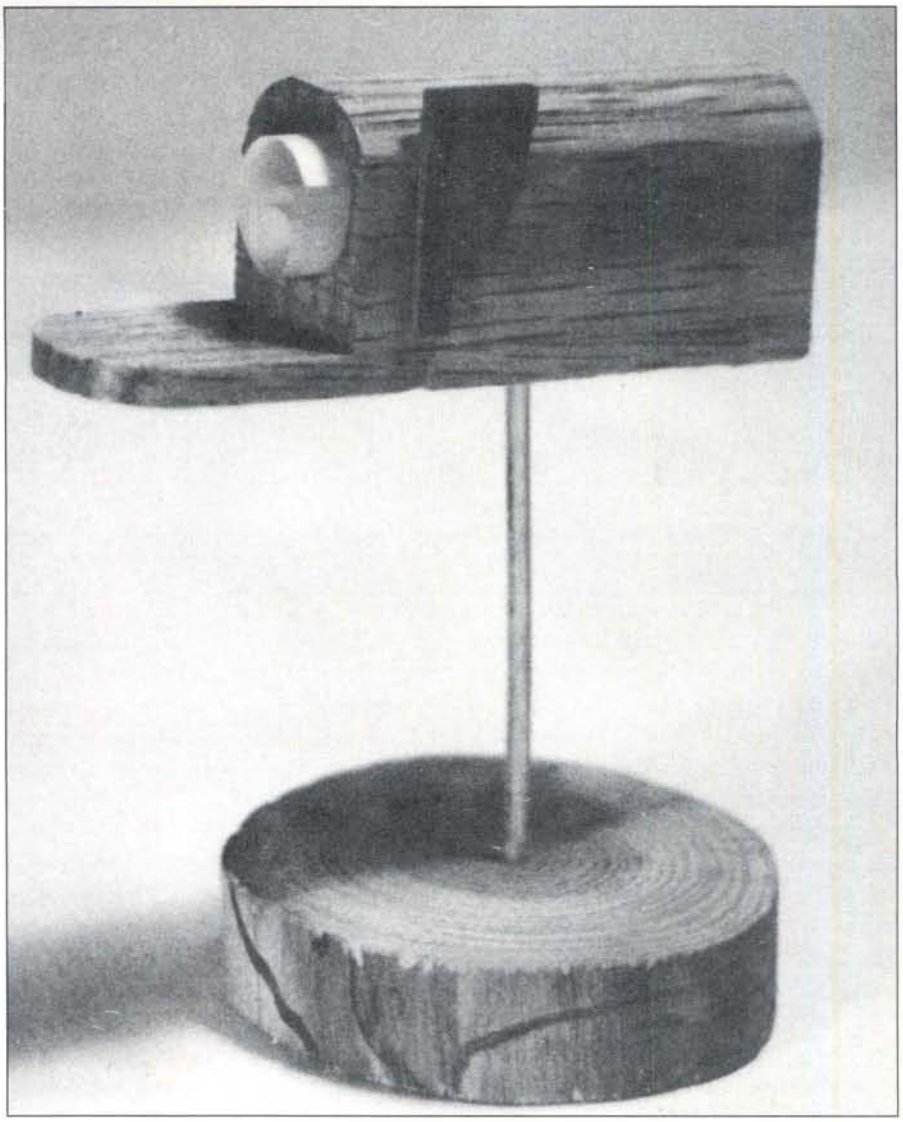
Make these miniature mailboxes from scrap 7/8" stock that is too small for furnituremaking but too big to burn. We use slices of tree branches to make the bases, and for the posts we use bamboo skewers from the grocery store. The skewers are 12" long and close enough to 1/8" in diameter to work with, and at $1.50 for a package of 100, they're much cheaper than 1/8" dowels.

To make the "body" of the mailbox, set up your router table with a 3/8" round–over bit. Round both surfaces of one edge of your stock; then rip off this rounded edge at 7/8" width on the table saw. Now take the squared scrap back to the router table and repeat the process until you've made as many rounded, 7/8" wide strips as you can from the piece.

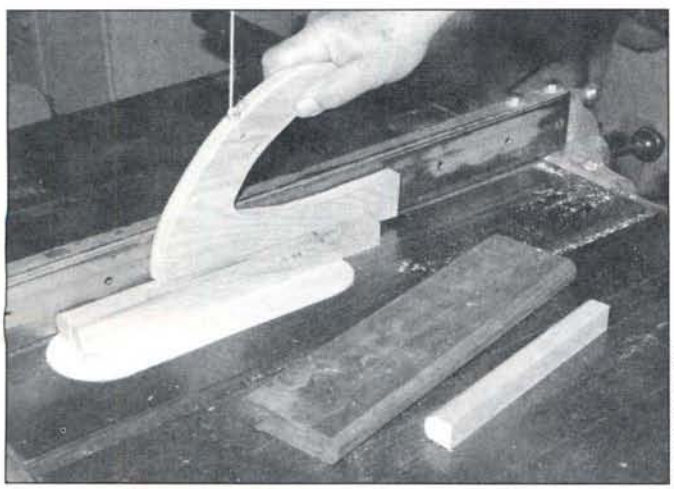
Use another piece of scrap for the "lid" segment. Crosscut this piece to a finished length of 6". Using the same router table

Alice and Robert Tupper *are husband and wife woodworkers who build projects together and restore antiques in Canton, South Dakota.*

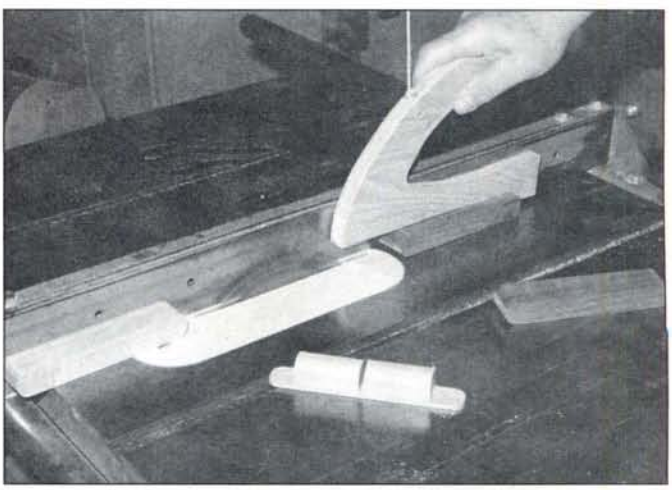
Phil Fischer



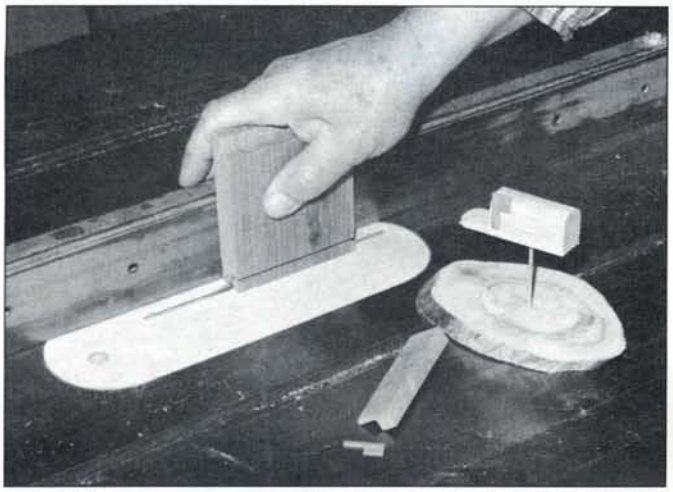
To make the mailbox bodies, first round the edges of your stock with a router; then rip them to 7/8" wide.



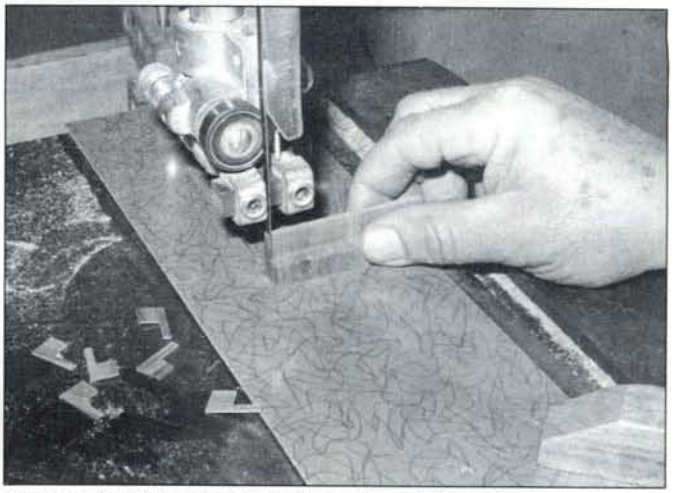
Round the ends of some 6" long stock across the grain, and rip it into 1/8" thick strips. Each strip will make lids for two mailboxes.



photos by the authors



Rabbet the end of a board to create the L–shaped section for the flags; then cut it to length.



Bandsaw individual flags from the L–shaped stock. Plastic laminate fitted around the blade will keep the tiny pieces from falling through.

setup, round both surfaces at both ends *across* the grain. At the table saw, slice this block into 1/8" thick strips. (Make a new table saw insert that fits snug all around the blade.) Each strip will make the lid segments for two mailboxes.

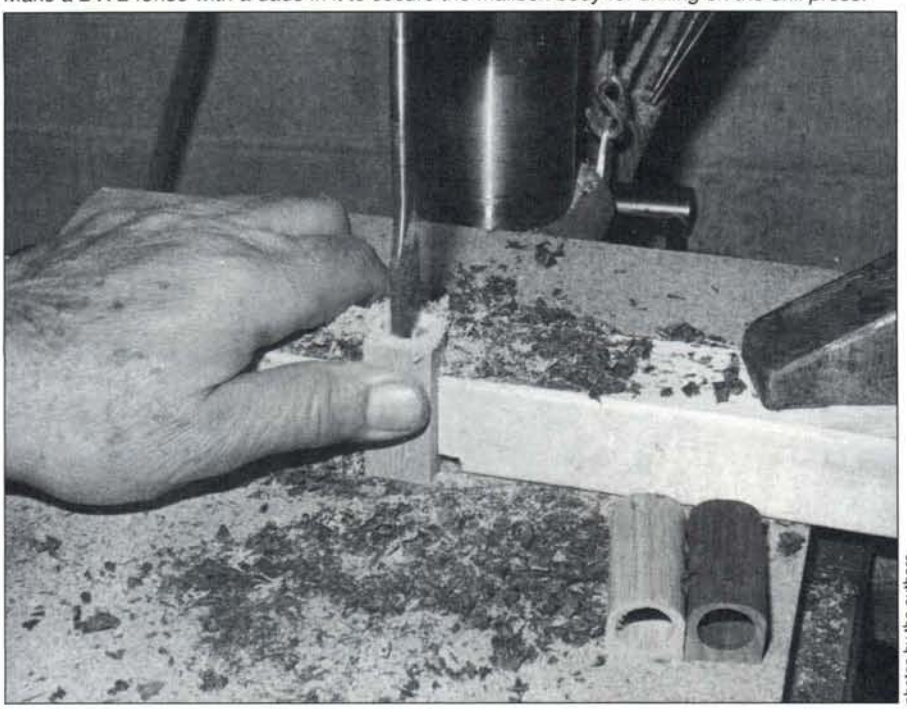
Cut the body stock into 2" lengths and drill a centered 5/8" hole in the end of each piece. To do this, we chucked a 5/8" bit in the drill press and set it to a depth that stops the point 1/8" from the table. We then made a holding jig from a piece of two–by with a 7/8" dado in it (see photo below). Another, wider dado on the bottom of the piece allows for chip clearance.

Glue two of the bodies centered on a lid segment with a narrow space between them. When the glue is dry, cut the two mailboxes apart trimming their ends flush at the same time. Drill a 3/32" hole 3/16" deep into the bottoms to accept the skewers.

Make the flags from a short scrap of red cedar. Set the table saw to cut 3/8" deep with the fence 3/8" from the *outside* of the blade. Make this cross cut with the end of the block against the fence. Next, run the block through vertically to complete the rabbet. Raise the blade to a height of 7/8", set the fence for 1/2" to the *inside* of the blade and run the scrap through vertically with the rabbet against the fence. Now move the fence out of the way and use the miter gauge to trim off the L–shaped end of the block at a length of about 7/8". Slice this L–shaped stock into 1/16" thick flags at the band saw as shown in the photo above. We clamp a scrap of plastic laminate to the band saw table to surround the blade and keep these tiny pieces from falling through. Paint a little glue on the back of the flag, near the bottom, and tape it in place until dry.

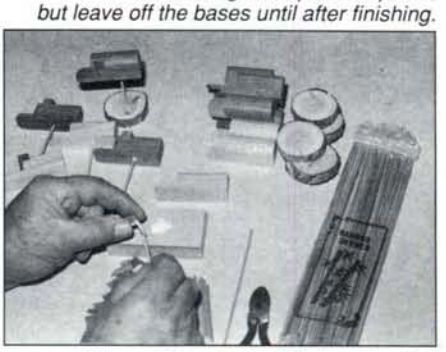
To finish our miniature mailboxes, we glued the skewer in place, then we dipped each one into some Deft® clear lacquer finish and removed the excess by spinning the skewer between our fingers. Now cut some white note paper into 1–1/4" x 1–1/2" pieces and start addressing your miniature mail. PW

Make a 2 X 2 fence with a dado in it to secure the mailbox body for drilling on the drill press.



photos by the authors

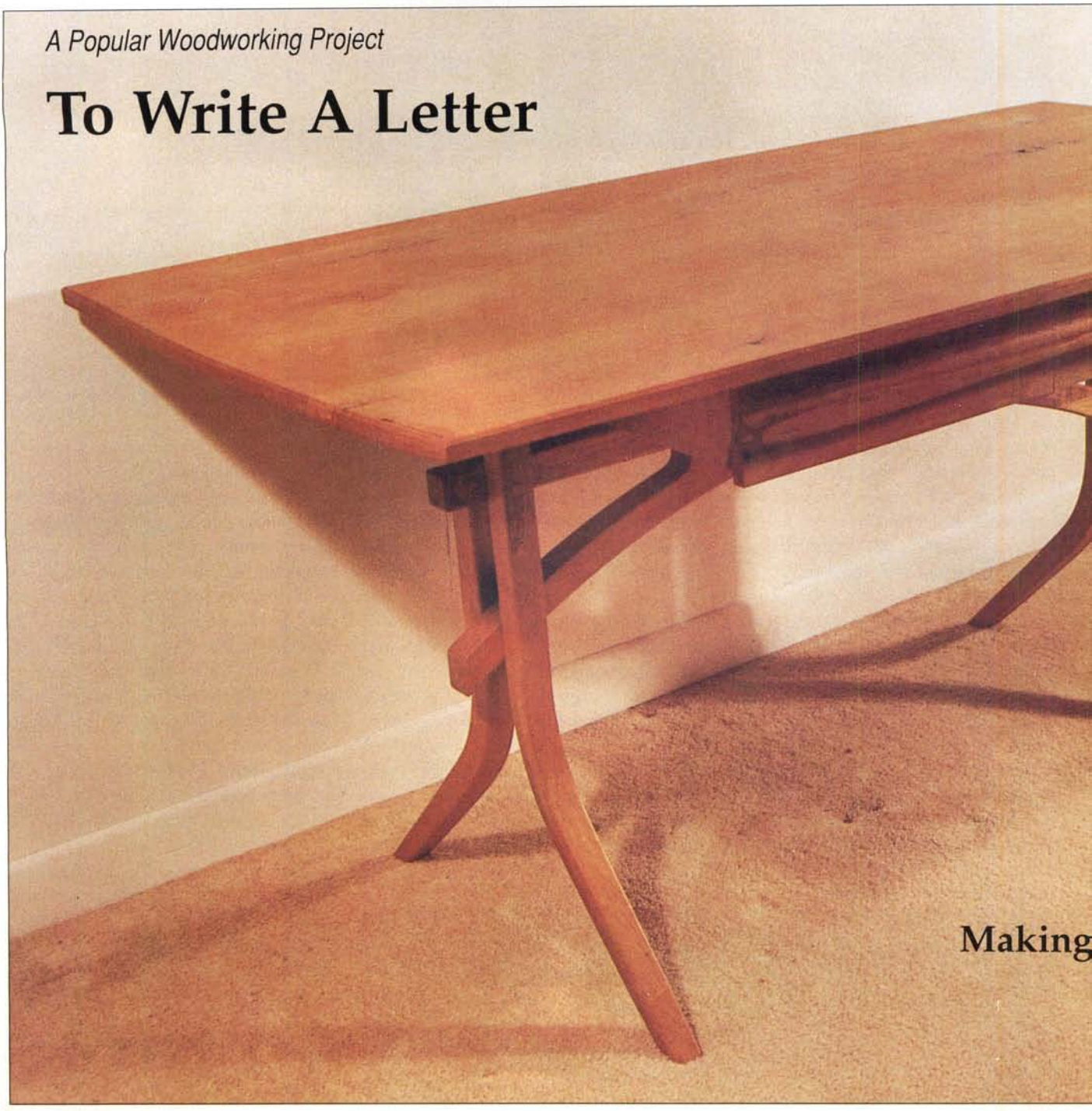
Glue the flags and posts in place, but leave off the bases until after finishing.



Dip a mailbox in the finish, and spin it between your fingers to remove the excess.

A Popular Woodworking Project

To Write A Letter



Making

by Ken Sadler

In the days before fax machines and telephones, people wrote letters, and writing tables were in vogue. Even today, many people still write letters by hand. If someone in your home likes to do this, they'll enjoy this small writing table. It has a slightly oriental flavor, but the design is such that it will fit with any decor, and in spite of the curved legs, it's easy to build.

A gracefully curved leg is always a thing of beauty wherever you find it—especially on a piece of fine furniture. However, curved legs, or any curved part for that matter, can present problems. When faced with this problem there are three ways to solve it: you can saw them to shape, or you can shape them by steam bending, or you can make them by laminating. Sawing is the easy way and it's fine for simple parts with only a slight curve. However, if the curve is more than a few degrees, then, because of the problem of grain lines, you have to make the part in several pieces or it will be weak and easily broken. Steam bending has been used for centuries to make parts for everything from cradles to ships; however, it requires quite a bit of equipment and it's very messy. Furthermore, the part has to stay in the bending jig until it dries, which could take several days. For my money, laminating is by far the best way to do the job. All you need is a laminating jig, a handful of clamps, and a pot of yellow glue. The jig is no more complex than that for steam bending and you can easily make it from scrap material you have around the shop. As for time in the jig, the glue will have to set up sufficiently for the part to be re-

***Ken Sadler** is a retired furnituremaker in Sheridan, Oregon.*

ontemporary Writing Table

photos by the author

moved—a matter of four to six hours. Finally, a laminated part is far stronger than one made any other way and will retain its shape better. This is particularly true if the wood has a tendency to be brittle or if the final cross–section is going to be small. The strength factor is important because it will allow for more delicately shaped parts than would otherwise be possible.

A Leg Laminating Jig

I use curved legs in several of my furniture designs, and I've come up with this jig for bending and clamping the laminates to shape. It can make two basic blanks (see Figure 1) from which a variety of legs can be made—legs for end tables, occasional tables, coffee tables, desks, and even dining tables. Just apply a little imagination and you'll see all the various arrangements that are possible. This writing table project makes use of the 45° curved legs; pictured below is a small occasional table that incorporates the 90° blanks. [*Editor's note: plans for this occasional table will be presented in a future issue of* PW.] The jig I've designed will make either blank by the simple expedient of attaching or removing one piece.

The base of the jig is a piece of 3/4" plywood that is 16" X 36". This doesn't have to be top grade stuff; CDX will do nicely, just be sure that it's flat. The first step is to lay out and draw lines AB and AC as shown in Figure 2. To simplify things for you, we've put a full–size pattern of the curved block in the PullOut™ Plans section in the center of the magazine. Now cut the various blocks that form the jig. The straight ones are 1-1/2" X 2" in cross–section and can be cut from old pieces of 2 X 4 or something similar. The

illustrations by Tom Larson

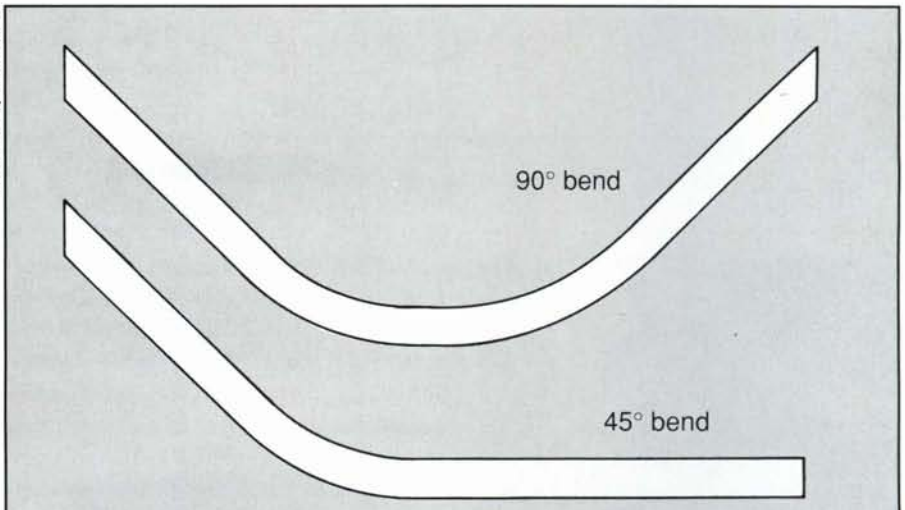


Figure 1. The Two Types of Legs

The bending jig used to make the 45° bent legs for the writing table described in this article can also be used to make the 90° bent legs for the small occasional table shown below. Plans for the occasional table will be featured in a future issue of PW.

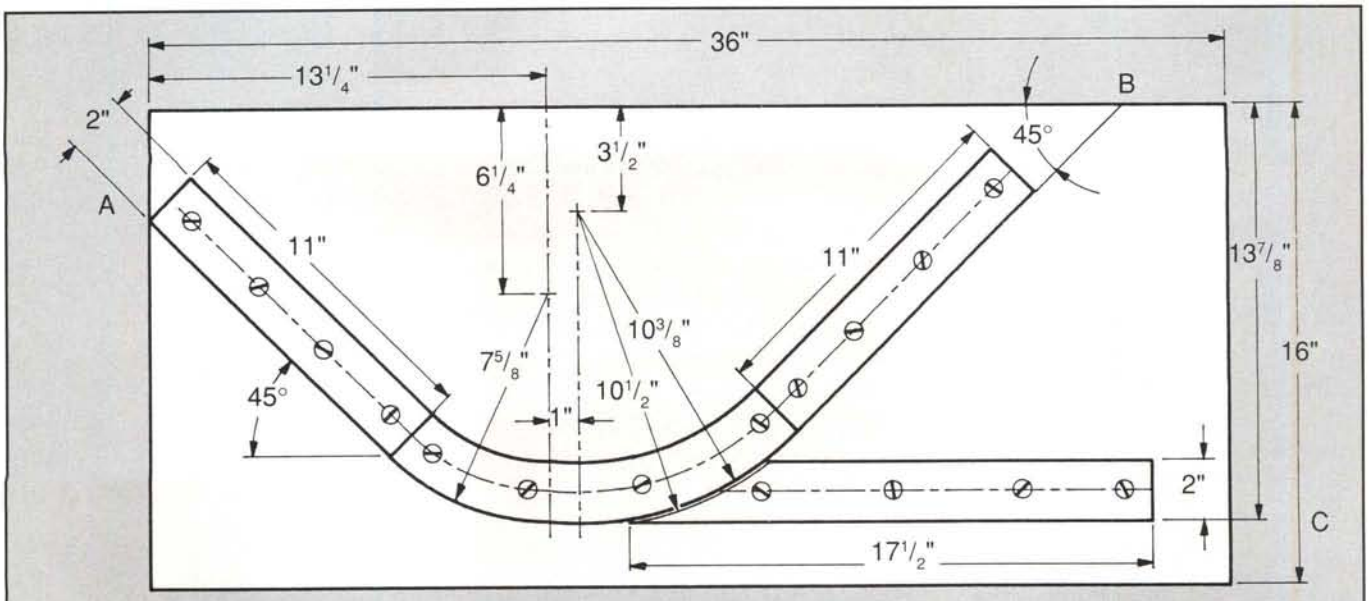
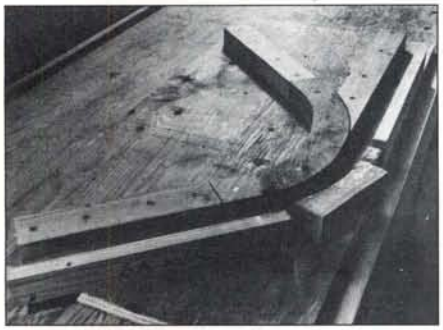


Figure 2. The Leg Laminating Jig



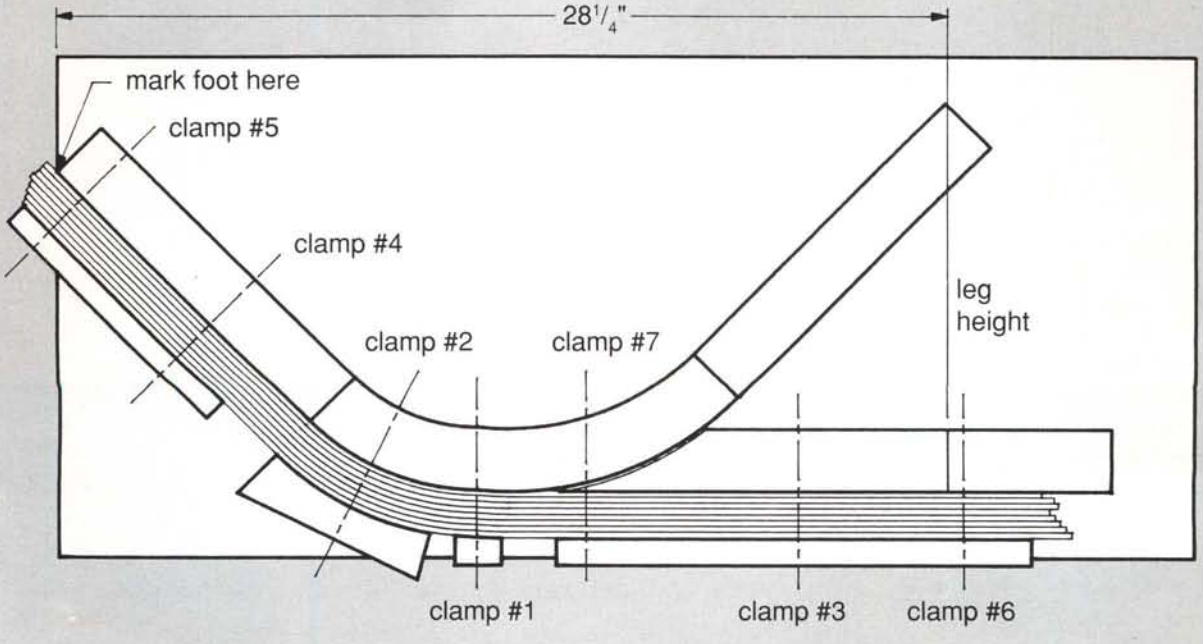
Set up the jig as shown to make the 45° curved legs used in this project.

curved block is made up of two pieces cut from 3/4" plywood. Screw the blocks in place using #10 X 2" flat head wood screws as shown. The blocks following line AC can be glued to the plywood base as well for greater strength. The straight block on the right end of the AB line must be removable so that the 90° leg blank can be made. If you use glue, be sure that you don't leave a little fillet of glue where the blocks meet the line. The clamp blocks should be made from 3/4" X 1-1/2" thick stock as shown in Figure 3. You will need three 5" C–clamps and four 6" C–clamps. Figure 3 shows where each is used.

Cutting the Laminates

The finished height of the leg in this project is 28-1/4". Measuring from the left edge of the jig straight along the bottom, place a mark at this distance on the jig block as shown in Figure 3. Now, using a flexible steel tape, measure the distance along the curve from the left edge of the jig to this mark, and add 2". This is the length

Figure 3. Using the Jig



illustrations by Tom Larson

of the material you'll need for your lamination, (it should turn out to be about 34"). Precision is not required here.

You do need to be precise, however, when milling the thickness of the laminates. The finished cross–section of the leg is 1-1/2" X 1-1/2". With the sharpness of the curve involved, 3/16" is the thickest laminate that should be used. Eight of them will be needed to make one leg. Since it is impossible to keep the laminates in line during the bending process, a minimum width of 2" should be used, so you can trim the leg to its finished width. Start with 2 blocks that are 2" X 5" X 34". Joint one face and both edges square with each other. When choosing the material for these blocks it is best to use fairly straight–grained wood. Some figure will be all right in the straight sections but not in the area of the curve.

The cutting of the laminates can be done on either a band saw or a table saw. If you can't be sure of a uniform cut on your band saw, it will be better to use the table saw. Use a planer blade with the thinnest kerf you can find. Set your fence to 3/16" and start ripping. Now, here's the trick to making the final product look as though it was not laminated. As you rip each piece, lay it aside and then lay the next ones on top in the exact order in which you cut them. When you have eight, bind them together with masking tape and mark them "leg 1," "leg 2," etc. Don't try to smooth up the mating faces; just leave 'em alone. When you've cut one set, take the block back to the jointer and joint the face you're cutting. This way you'll have one smooth face on each set. This face will go against the jig blocks in the gluing process.

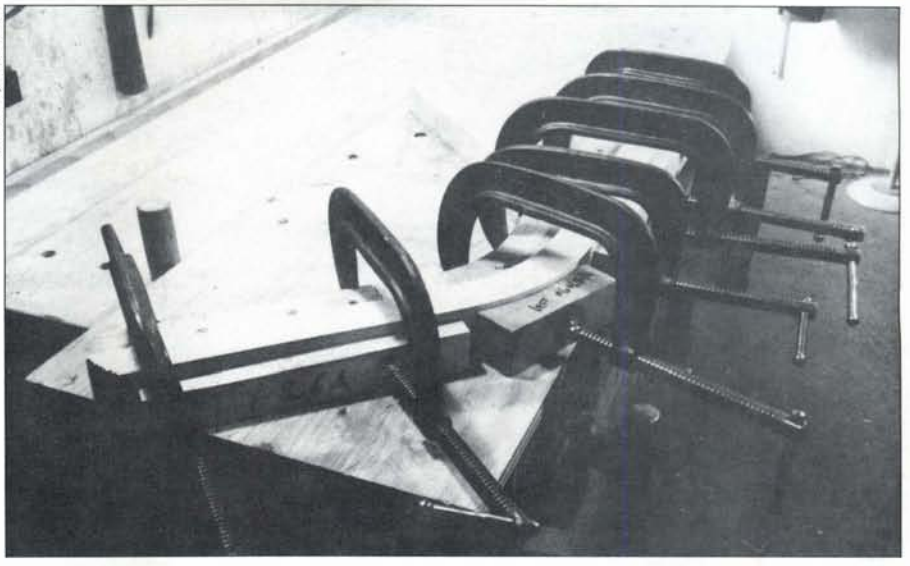
Working with the Jig

I've found that the best way to hold the jig while doing the job is to grip it between the bench dogs on your workbench. Before actually gluing up a set, I think it would be a good idea to have a dry run, in order to get the hang of things. Once the glue is in place there isn't much room for error or time to run after something you forgot. Having put a set through the process dry, the pieces will remain somewhat bent. This will make it harder to apply the glue, but not enough to cause trouble.

Measure along the curve of the jig blocks from the left edge to the position of the #1 clamp. Add about 3/4" and measure this distance from the bottom end of your set of laminates. Make a heavy mark across all the laminates at this point on the side that will be up. The weight of this mark is not so important during the dry run, but with the glue in place, a light line can become obscured. Now, place the set on the jig with the mark at the position of the #1 clamp. Position this clamp, with its clamp block in place and tighten it, but not entirely. Put the #2 clamp and block in position and tighten it enough to hold it in place. Next, apply the long clamp block and the #3 clamp, and pull it up enough to hold it in place. Now slowly tighten the #2 clamp two or three good turns, then do the same with the #3 clamp. Continue tightening until you have the inner face of the lamination almost touching the jig blocks at these points. Now put the #4 clamp in place and tighten it until the inner face is almost to the jig blocks, then tighten #2 completely — as tight as you can get it. Do the same for #4 and then #1 and #3. Now put #5 and #6 in place and tighten them fully. Finally, set the #7 clamp and tighten it fully. If everything has gone smoothly, you're just about ready to *do it with glue.*

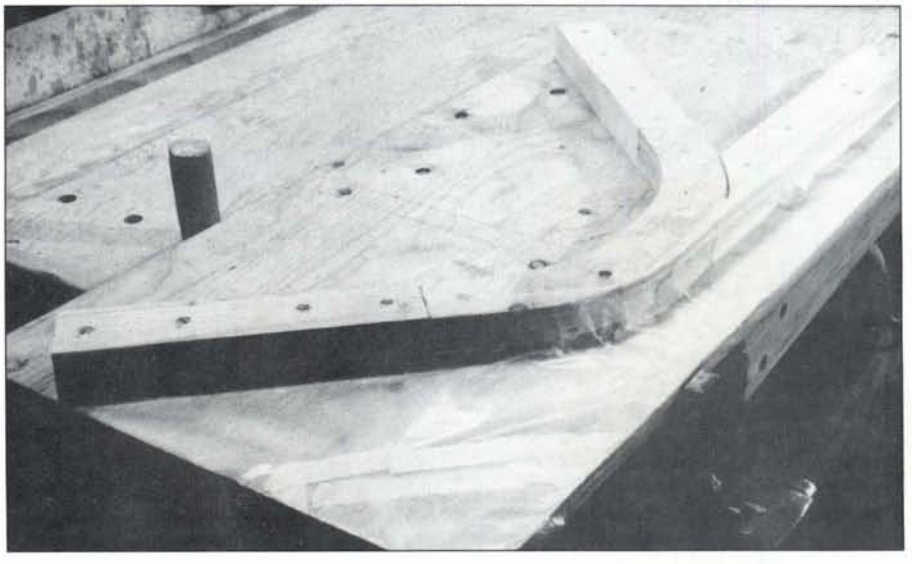
Before doing the job with glue, however, there is an additional and very necessary step that was purposely left out of the dry run. You need to line the jig with wax paper. If you don't you'll never get the blank out of the jig. Cut several strips of wax paper about 6" wide and 12" long, and fasten them in place with masking tape. It's difficult to explain how this is done but if you will look closely at the bottom photo below, I think you'll be able to see what to do. Don't worry about it being smooth, that doesn't matter, just see that the face of the

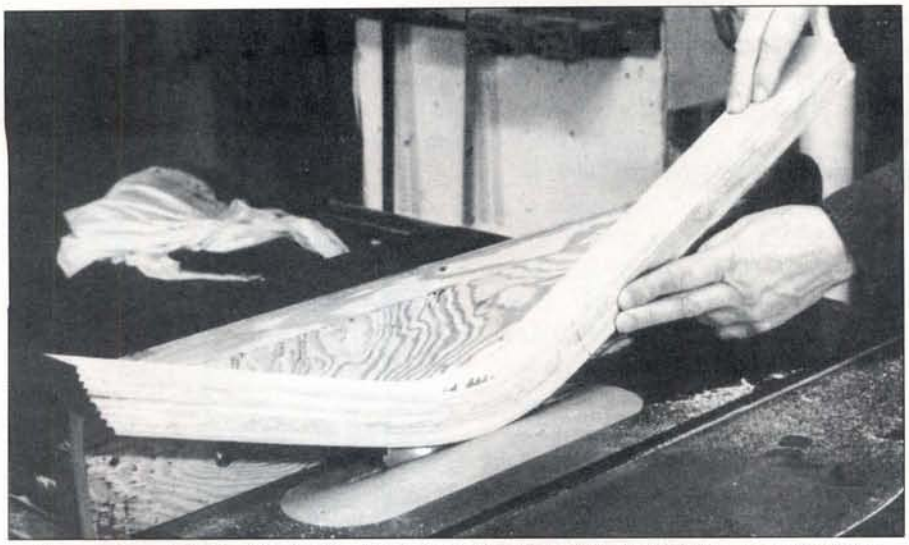
photos by the author



Practice clamping the laminates in a dry run, placing the clamps in the order shown in Figure 3.

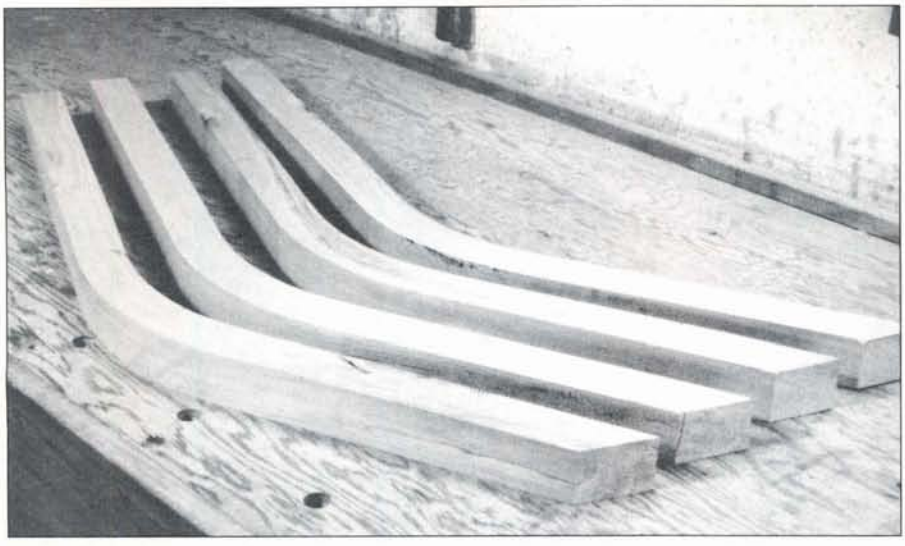
When you're ready to glue, line the jig with wax paper so the leg blanks don't get permanently glued to the jig.





Joint one edge of the leg blank; then trim it to the finished width. It's best if you can finish the cut with the long portion of the leg on the table, rather than the short portion.

When the legs are all jointed smooth and trimmed to length, you're ready to lay out and cut the tapers on the bottom.



jig blocks and the entire flat surface in front of the blocks is covered—not only covered, but turned under the edges and taped to the bottom.

When applying the glue, use a stiff 2" brush sideways (I sort of scrub the glue on), and cover both surfaces of the mating faces entirely. Be sure and keep them in order. Line up the ends and sides (they won't stay that way, but they should be so at the start), place them in the jig in the proper position, and proceed as in the dry run. Now that there is glue between the laminations, they will want to move around relative to each other. You won't be able to control this entirely but you should push them back into place as best you can during the tightening process. You will also have excess glue oozing out the top and bottom. Don't be concerned about this; it will all clean up later.

After about six hours, you can take the blank out of the jig. You can't do any work on it at this time, but you can glue up another set. When the blank comes out of the jig, the wax paper will stick to the underside and there will be wet glue between the paper and the blank. Peel the paper away and use an old putty knife to scrape off as much of the wet glue as you can. This will speed the final drying and save work later on.

Final Shaping of the Legs

When the last set has been out of the jig for 24 hours, the finishing of the blanks can begin. The first step is to joint one edge square with the back of the blank (the face that was out in the jig). In choosing which edge to joint, remember that you will be ripping the blank to width, and the face that goes against the table saw fence should be the one that will let you run the top end of the blank through the saw last (see the photo at left). This provides a long, straight face on the saw table which allows better control of the cut. With the jointing operation, don't go any deeper than is necessary to get a smooth, flat surface. Remember you only have 1/2" leeway to play with. Once you have jointed all the blanks, rip them to 1-1/2" plus 1/32" (if you've got it). The 1/32" will allow a final run through the jointer to clean up the ripped face.

Having cleared away all the wax paper and masking tape, put one blank back in the jig so that it fits the curve snugly. Mark the foot at the left edge of the jig and cut it at a 45° angle to the face as shown in Figure 3. Mark the top at the "leg height" mark you made, and cut it square with the face. Mark the other three blanks from this one and make the cuts.

The next step is to cut the 3/4" square tenons on the top of each leg as shown in Figure 4. The easiest way to do this is to make the three horizontal cuts (for the shoulders) that can be made on the table saw using the rip fence as a guide. Then make all four vertical cuts (for the cheeks) with the waste wood on the outside of the blade. Now you can make the fourth horizontal cut with a hand saw. Do this carefully so that the shoulder remains true all around.

The last operation on the legs is to taper the foot as shown in Figure 5. Cut a single taper on the inside of the curve, beginning at the bottom of it. The double taper on the sides begins at about the same point. (The drawing shows 8"; this is approximate.) Rough cut these tapers on the bandsaw and smooth them with a spokeshave. Blend the beginning of the taper so that it's a smooth curve and not an abrupt angle. Do not bevel or round any edges at this time.

The back face (the outside curve) of the leg has a rough–sawn surface. On the straight parts of this surface, take a very light cut on the jointer — just enough to clean up the saw marks. Clean up the curved portion with a spokeshave.

The Rest of the Table

The spreader for the table (A) is cut from a solid board that you will probably have to glue up. The overall width is approximately 9". Earlier I said that sawn curves were often weak. In this case, however, the bottom of the curve is captured between the legs, and doesn't take any real stress against a short grain sec-

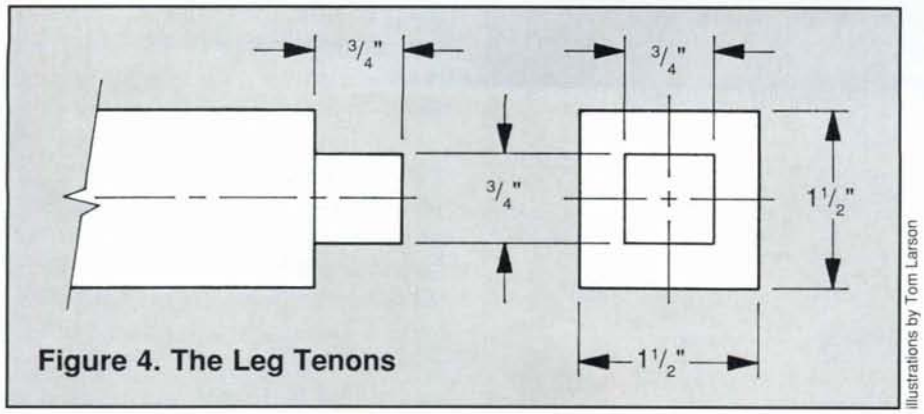
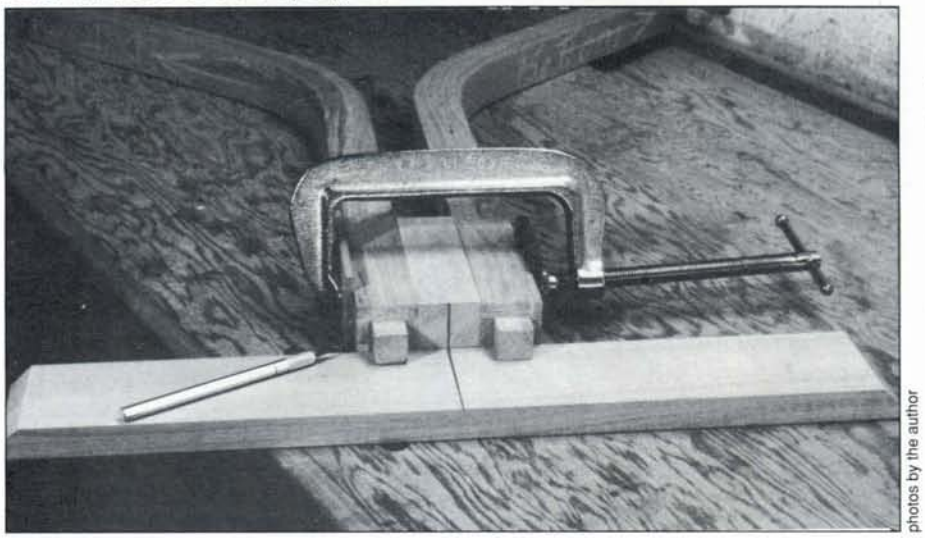


Figure 4. The Leg Tenons

illustrations by Tom Larson

Cut the tenon shoulders on the table saw using the fence to reference the cut. Because of the bend in the leg, you'll have to make the fourth cut with a hand saw.

Clamp a spacer that is the exact thickness of the spreader (A) between the legs, align its center with the center of the top support, and mark the mortise locations from the tenons.



photos by the author

tion. Therefore, the sawn curve will work just fine, and it is much easier to make. With the glued–up piece finished to 1-1/2" thick by 40-1/2" long lay out the spreader using the full–size half–pattern in the Pull-Out™ Plans section in the center of the magazine.

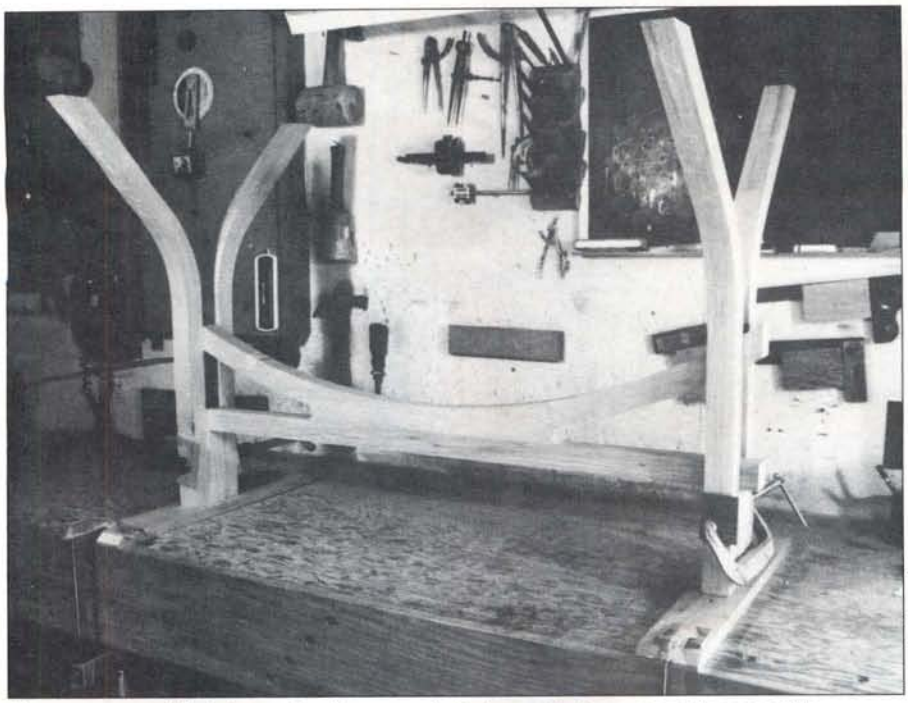
Use a 1" Forstner or multispur drill bit to cut the small curve in the junction of the forks. This will result in a relatively smooth surface that can be finished with sandpaper. Saw the rest of the shape on the bandsaw, leaving the line. The easiest way to smooth the surface is with a spokeshave. At this time, don't round or in any way break the edges. Those sharp edges will be very important in the assembly operation. Another important thing to do now is to cut two spacer pieces that are 1-1/2" wide by the finished thickness of the spreader by 5-1/2" long from the scrap from the spreader. Set these aside; they will be vital in the assembly operation.

Cut the top supports (B) to finished size according to the cutting list and cut a 1/2" bevel at each end as shown in Figure 5. In laying out the mortises for the leg tenons, do it from the actual tenons and not from the drawing. First, number each leg and pair them up. Place one of the spacer pieces between each pair, with the thickness of the spreader separating the legs. Lightly clamp this assembly in this position. Placing them in position on the top support as shown in the photo below, mark the cross lines of the mortises with a sharp knife; then use a marking gauge to mark the other two sides of the mortises. I take out the waste with a drill that will leave a small amount of wood inside the lines. I then square the corners and trim to the lines with a chisel. When you've finished cutting the mortises, fit each pair of legs to its top support without removing the insert or the clamp. This should be a snug fit.

At this time, make the slots in the top supports that will take the screws that fasten the top in place. There should be two of them on each end of the support centered at 4" and 8" from the centerline of the support. They should be 3/16" wide X 3/8" long to take #10 X 1-1/4" pan head screws with washers. The reason for these slots is to accommodate the shrinkage and expansion of the top that will occur with humidity changes.

Assembling the Table

This next operation is a bit ticklish and



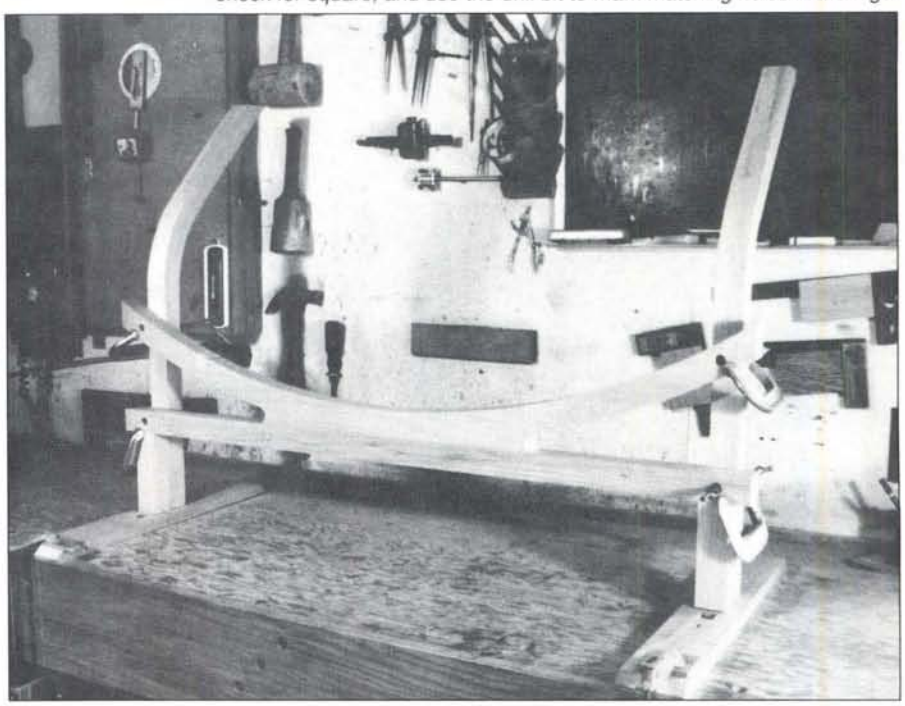
photos by the author

Use your spacer block to position the spreader between the legs, clamp the assembly together, and make sure it's all square before you mark where the legs cross the spreader.

glue in the top support mortises only at the point of entry, so that as the tenons go in, they will wipe the glue over the rest of mortise face and not out the other end.

Making the top (C) is simply a matter of gluing up the boards to get the necessary width, finishing the surfaces, and cutting the resulting panel to shape. In choosing the wood for this, try to find boards with similar color and grain so that when you're finished, it will look like one piece instead of a bunch of boards glued together. Notice that the back edge (which usually goes against a wall) is straight, while the front is slightly concave and the ends are slightly convex. Have someone help you flex a batten to guide your pencil in drawing these curves. A 1/8" bevel around the top edge will add a nice touch. The bottom edge can have a slight radius. You can mount the top on the base now, or wait until you've finished the drawer and hang

must be done with great care. The legs and spreader are fastened together with blind dowels. Start this by putting together both sets of legs and top supports with the spacers resting firmly on the top support. Set them up on your workbench with the top supports down and place the spreader in position as shown in the photo above. Press the spreader firmly down on the spacers. Square everything up—legs with top supports and legs with spreader—and clamp firmly so that they won't move. Mark the outline of the legs on both faces of the spreader with a pencil. Now, take the assembly apart, and drill a 1/2" hole all the way through the approximate center of each marked space. Use a drill press so you drill straight and square. Put one leg of each pair in place on the top supports, and set the spacers in position. Put the spreader on top of the spacers as shown in the photo to the right, and line up the legs with the line you drew on the spreader. Square everything as before, and clamp so that there can be no movement. Take the 1/2" drill bit (this must be a brad point drill bit), slide it through the holes in the spreader, and mark the legs with the brad point. Do the same with the other set of legs and then drill 1/2" holes 3/4" deep on the marks. In putting this assembly together, don't use a single dowel all the way through the spreader. Instead use 1-1/4" long dowels in the legs, then

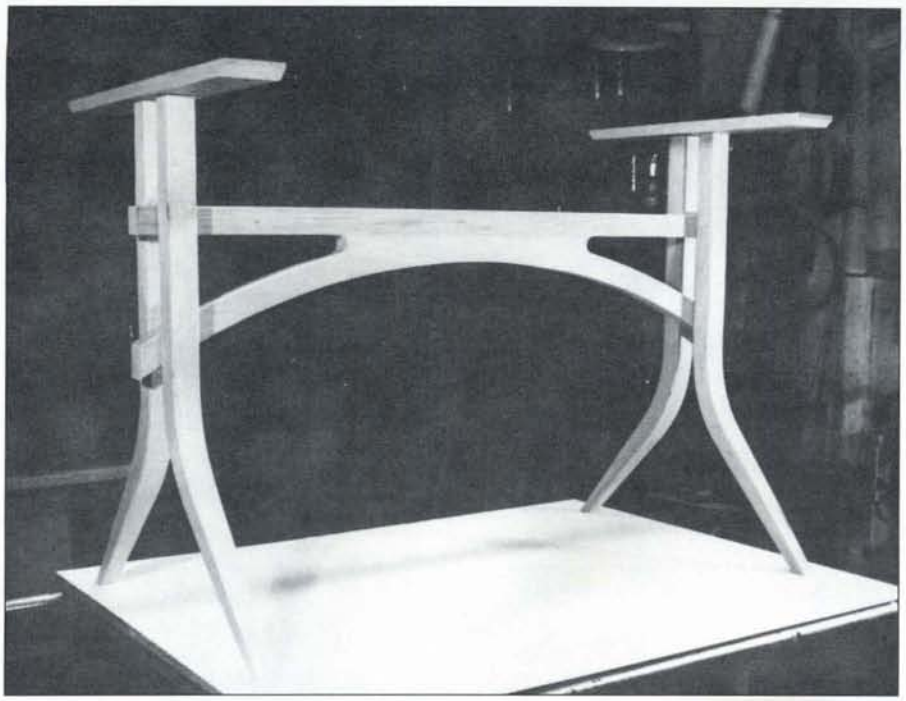


After drilling the spreader for dowels, reassemble, check for square, and use the drill bit to mark matching holes in the legs.

push the leg dowels into the spreader. Be sure and size the dowels so that they are no more than a tap fit. Put it all together dry to make sure everything fits and is square. Then take it apart, round or bevel all the edges, finish sand all the parts, and put it back together—this time with glue. Use glue only in the dowel holes and sparingly in the ones in the legs (use too much, and the dowel won't go home). If you put it on the faces of the parts, it will squeeze out and you'll have a difficult cleanup job. Put it at the same time.

Making the Drawer

The drawer in this writing table is constructed a little differently than most. It needs to have extra width on the front to cover the drawer hangers, thus the standard half–blind dovetail joint between front and sides won't work. What we'll use is a running dovetail as shown in Figure 6. There is a rather simple way to make this joint which I'll outline for you. First, make the front (D), sides (E), and back (F)



Dry–assemble the base with the dowels connecting the legs and the spreader, and check that the assembly sits flat and straight.

blanks to their finished sizes according to the cutting list. When making one of the sides, make it about 6" longer than required. Cut this off and use it for a test piece when making the running dovetail.

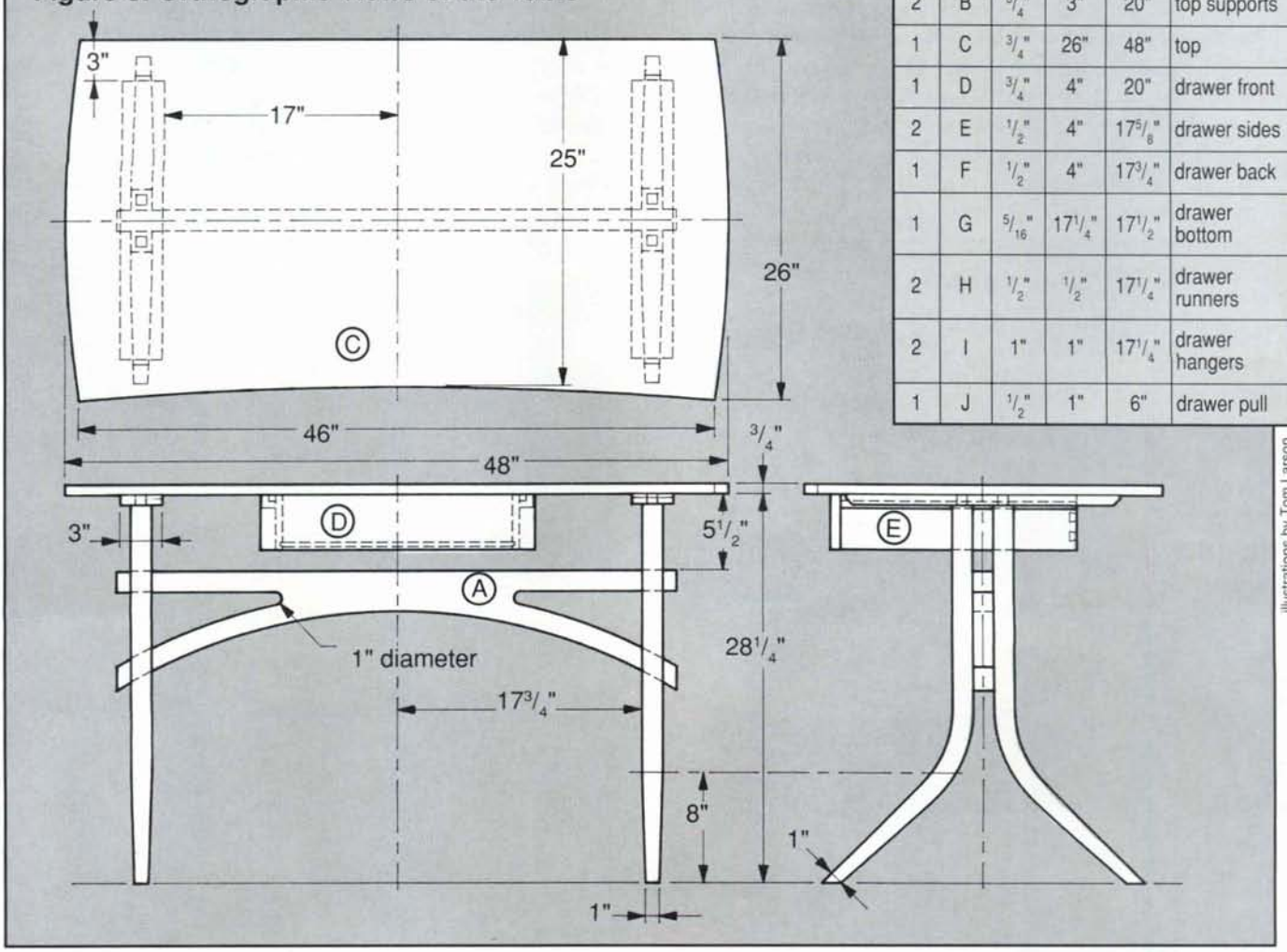
To make this joint, use a standard dovetail router bit with your router mounted in a router table. Set it so that the top of the cutter is 3/8" above the surface of the table. Set your fence (which should be about 3" high and have no openings in it) so that the distance between the fence and the top edge of the cutter is 1-1/8". Make this cut the full width of the drawer front. Now, adjust the fence so that the distance between the fence and the bottom of the cutter (at the table surface) is 1/2". This can best be measured with a

Writing Table

Cutting List

Qty	Part	Finished Size T	W	L	Piece
1	A	1 1/2"	9"	40 1/2"	spreader
2	B	3/4"	3"	20"	top supports
1	C	3/4"	26"	48"	top
1	D	3/4"	4"	20"	drawer front
2	E	1/2"	4"	17 5/8"	drawer sides
1	F	1/2"	4"	17 3/4"	drawer back
1	G	5/16"	17 1/4"	17 1/2"	drawer bottom
2	H	1/2"	1/2"	17 1/4"	drawer runners
2	I	1"	1"	17 1/4"	drawer hangers
1	J	1/2"	1"	6"	drawer pull

Figure 5. Orthographic Views of the Table



illustrations by Tom Larson

pair of inside calipers. Run the front end, outside surface of both drawer sides (E) through this setup in a vertical position, as well as both ends of your test piece. (Be sure you feed against the rotation of the cutter.) Now, run the other face of one end of your test piece through the cutter and try the result in the groove on the drawer front. If it's too loose, move the fence out a bit and make the second cut on the other end of your test piece. If it's too tight, move the fence in very slightly, and try again. Keep this up until you have a snug sliding fit in the groove; then make the second cut on the actual drawer sides themselves.

The joint between the sides and the back is a standard through–dovetail with the tails cut in the sides. In laying out the tails be sure that the bottom one is wide enough to cover the groove for the bottom (see Figure 7). Cut the tails first, and lay out the pins from them. Fit the drawer together to be sure it all works and is square; then cut the groove for the bottom. It should be 1/4" wide X 3/16" deep and located with its upper edge 1/2" from the bottom edge of the drawer (see Figure 7). Please note that while on the sides and back the groove goes all the way through, on the front it must be stopped off when it reaches the running dovetail channel, otherwise it will show on the outside. When the grooves have been cut, rip off the bottom edge of the back (F) to the top of the groove as shown in Figure 7.

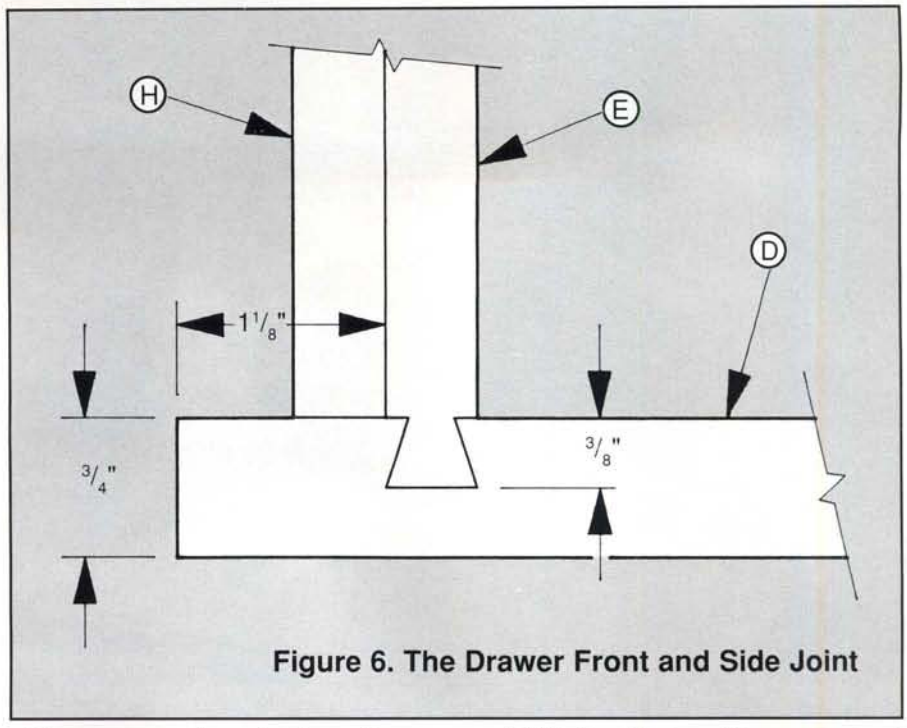


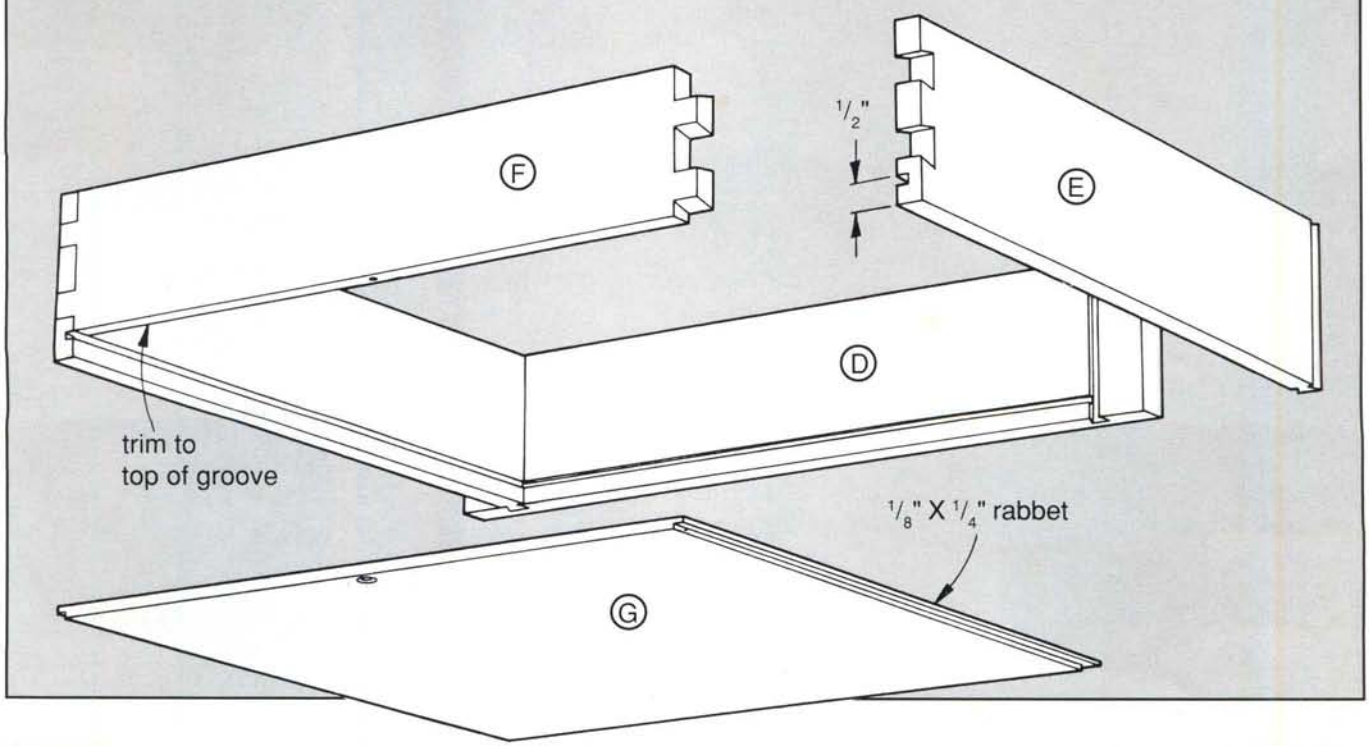
Figure 6. The Drawer Front and Side Joint

The drawer bottom (G) is another glued up panel. The choice of wood is not important here, in that the boards don't have to match. Make it 5/16" thick, and rabbet the front and side edges so that it slides easily in the groove. It gets fastened at the back with one or two #3 X 5/8" flat head wood screws.

Glue the drawer together and slide the bottom in place (without glue) to square it up. While the glue is setting, you can cut the drawer runners (H) and make the drawer hangers (I) according to Figure 8. When the drawer assembly has dried, glue the runners to the outside of the sides, flush with the top edge.

The drawer pull shown in the photo on page 64 was mortise–and–tenoned into the drawer front and then carved by hand—a lot of bother. Rather than have you do all that, I've come up with a simpler

Figure 7. Drawer Assembly



photos by the author

Set the fence 1-1/8" away from the cutter and make the cut across the back of the drawer front (D). Don't change the cutter height, but move the fence closer to make the dovetail tenon on the front ends of the sides (E).

routed pull (J) shown in Figure 9.

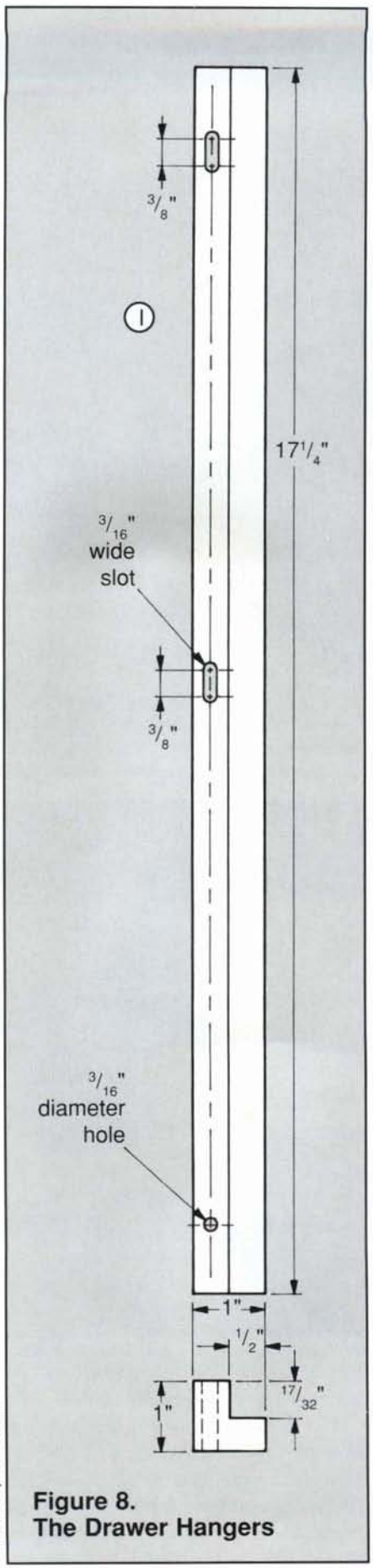
Choose a wood that either matches the drawer front or is in strong contrast to it, and cut a blank to the dimensions given in the cutting list. Set up a 1/4" radius cove cutter in your table–mounted router, with the depth at about 3/8" above the table surface. Use a fence with a gap in it, and position it flush with the guide pin on the bit. Use a miter gauge to help you hold the stock as you make the end–grain cuts first; then rout the edges by running them along the fence. Now bandsaw the top as shown in Figure 9, and then rout the edges again. For this second pass, you'll need to move the fence away and just rely on the bit's guide pin to follow the bandsawn shape. Since most of the waste was removed when you made the first pass with the fence, this second pass will be a very light cut.

After sanding every surface except the bottom of the pull, you can fasten it to the front of the drawer. Use a couple of 1/4" dowels, or simply glue it directly to the front. I don't like the latter method because, in positioning the handle, you invariably smear glue where you don't want it, and it becomes a real problem to clean up. If you use the dowel method, just put glue in the upper part of the dowel holes and be sure that the amount of dowel protruding from the handle isn't longer than the matching hole is deep.

The final operation is to assemble the top, the base and the drawer. Lay the top upside–down on a broad, protected surface (I use an old blanket). It's very upsetting to do all this work, get the piece together, set it up on its legs and then find you've scarred the top surface. Position the leg assembly on the top according to Figure 5 and screw it down. Put one drawer hanger in place, and screw it down. Now put the drawer in place and then position the other hanger so that the drawer slides easily, and screw it down. Turn the final assembly right side–up and see that the drawer still works smoothly.

I won't say much about finishing; everyone has their own finishing schedule. I prefer to use good wood with attractive grain patterns and finish it natural. If you want a light piece, use light wood; if you want a dark piece, use dark wood—not light wood stained dark. Stain only muddies the picture.

Now stock the drawer with stationery and writing implements, find a suitable chair, and you're ready to write a letter. PW



illustrations by Tom Larson

Figure 8. The Drawer Hangers

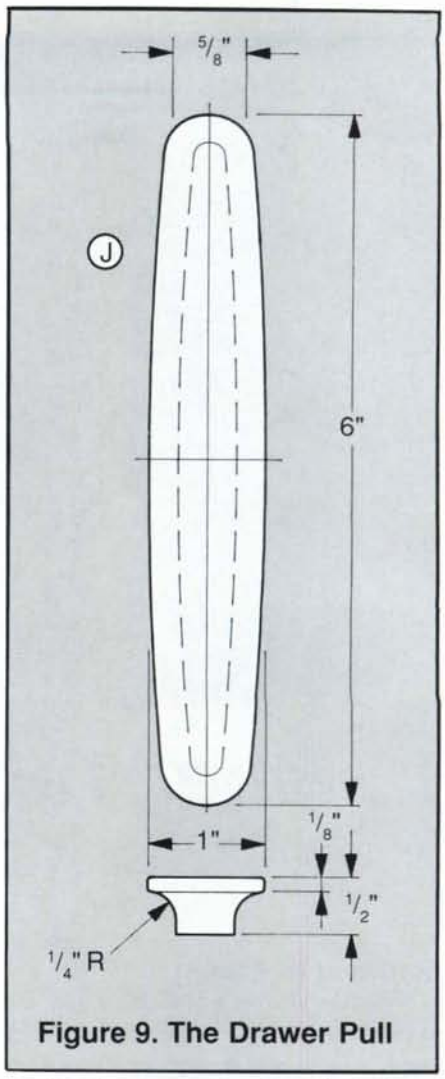


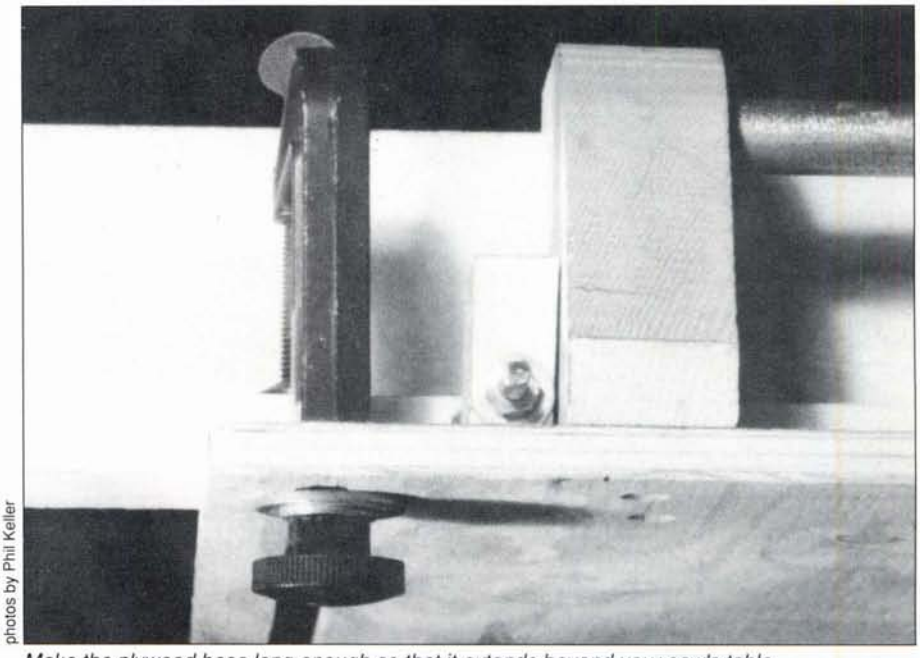
Figure 9. The Drawer Pull

Sliding Miter Table

by David M. Camp

A sliding table is a great table saw accessory that helps with cross–cutting large panels; this design by Phil Keller takes the concept one step further in that it also lets you cross–cut at angles. Phil used it to make the diagonal cut that separates the brackets for his "Victorian Mailbox Post" project on page 32, but it's terrific for all kinds of cuts.

Many sliding tables I've seen suffered from trying to straddle the blade and trying to run off of guide strips that slide in both miter gauge slots. One strip in one slot is all it takes to guide a sliding table, and by making the 3/8" plywood base a little long and trimming it with the blade the first time you use it, you can reference cut marks to the edge of the plywood to accurately line them up with the blade. The absence of the second guide strip makes the table slide easier, and if you feel the need to support the off–cut piece, simply place a scrap of matching thickness plywood on the other side of the blade. Phil adds to the ease of the sliding action by using PVC plastic for his guide strip instead of wood, which isn't as dimensionally stable.



photos by Phil Keller

Make the plywood base long enough so that it extends beyond your saw's table to allow clearance for the clamp knob.

The clamp Phil uses for securing the miter fence was taken off a Craftsman Universal Jig for the table saw; the clamp alone is available as a replacement part (called a "clamp body assembly," catalog #9-171-10979) for $5.49 from Sears. Because the locking knob of the clamp has to ride below the base of the fixture, you'll need to extend the base a few inches beyond any extension tables your machine may have—but what the heck? This just means you'll be able to support longer workpieces.

***David M. Camp** is the Editor of* Popular Woodworking.

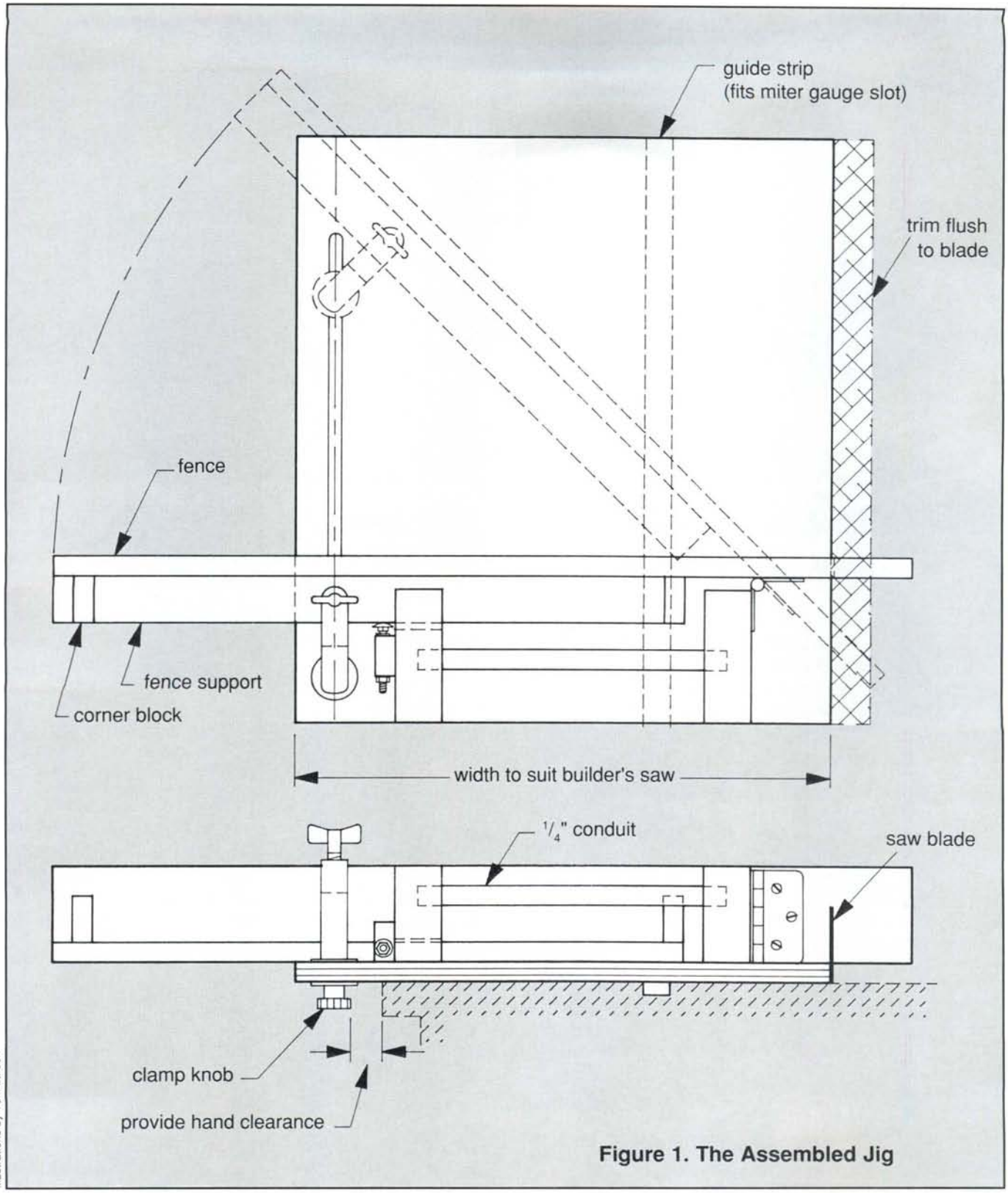
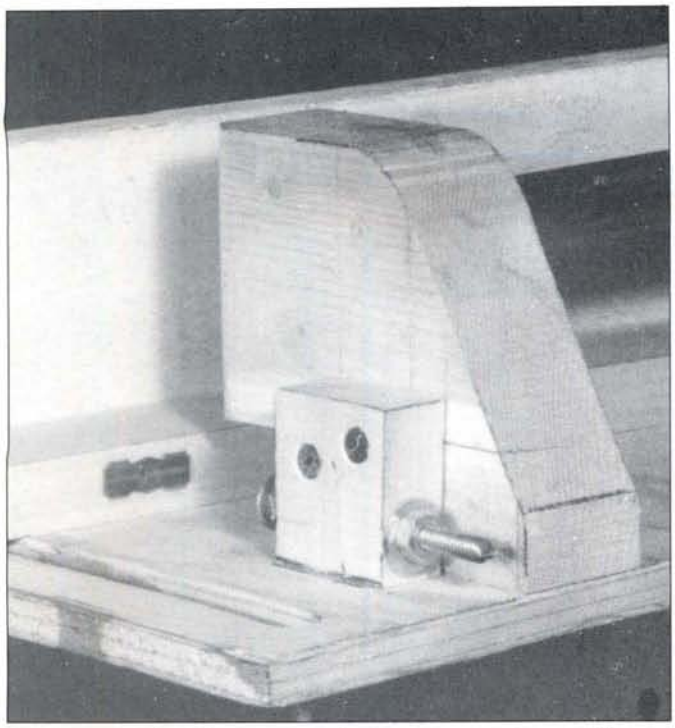


Figure 1. The Assembled Jig

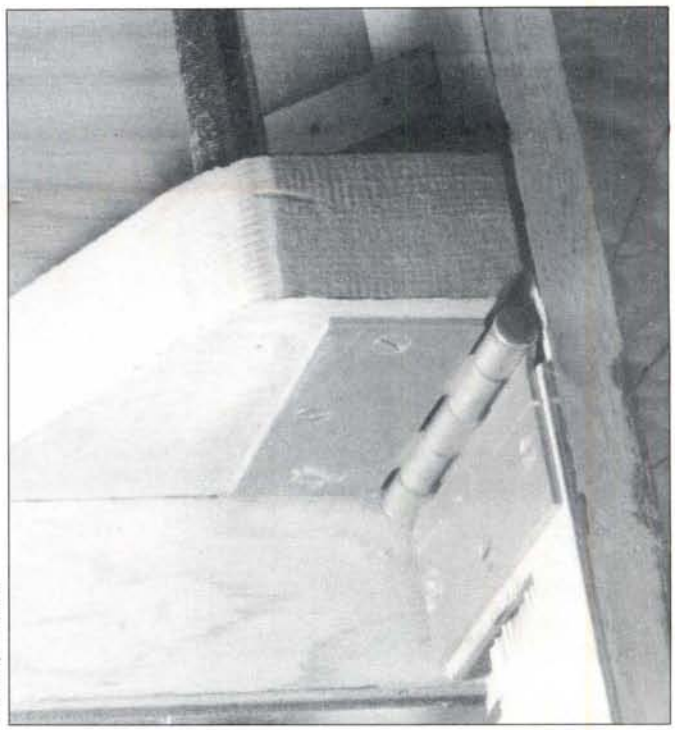
Illustrations by Tom Larson

Cut the plywood base to size, and cut a slot along the left–hand edge to accept the bolt from the clamp. Next, make the push bar assembly from two 5" lengths of 2 X 4 stock and some 3/4" electrical conduit. Drill blind holes in the blocks for the conduit; then trim and round the back ends of the blocks as shown in the photos. Cut a 7/8" X 1-3/4" notch in the left–hand block for the fence support to fit into and rip a slight bevel along the forward edge of the right–hand block to provide clearance for the hinge (see the photo on the following page). Cut the conduit to a length that, when fitted in the blind holes, will allow you to position the blocks 2" in from the right end and 2" in from the groove on the left. Attach the push bar assembly to the base with glue and countersunk screws driven up from the bottom.

The next step is to make the fence



photos by Phil Keller



Notch the push bar block to allow the fence support piece to slide back into position. A flat staple serves as a strike plate against the carriage bolt stop.

Bevel the front edge of the right–hand push block to provide clearance for the spine of the hinge. Mount the hinge slightly past the block so that it doesn't interfere with setting the fence.

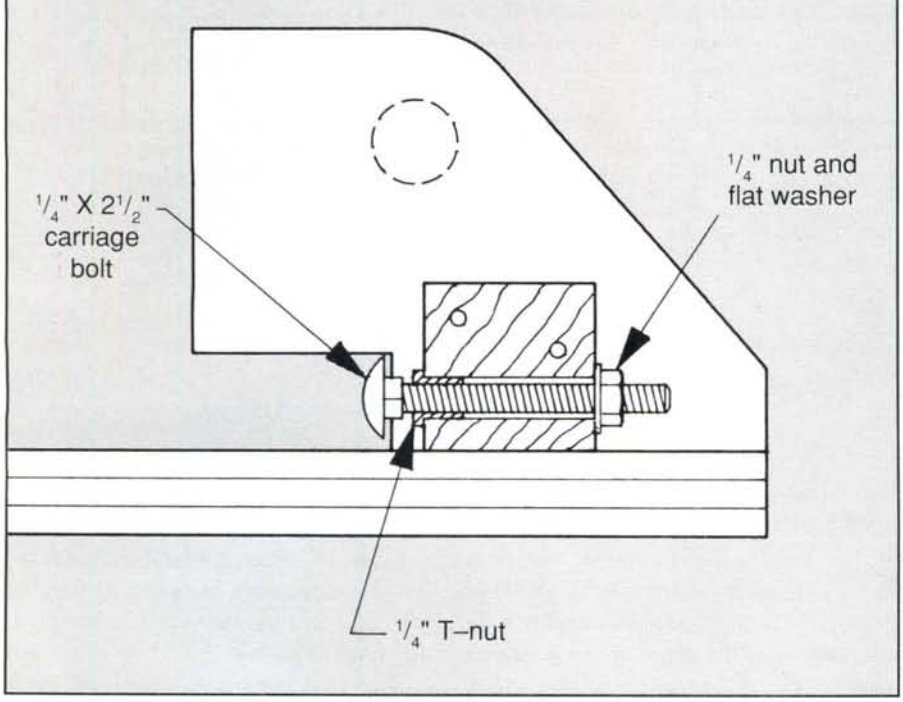
assembly. Phil used a 36" length of 1 X 4 for the main fence and attached it to the 1 X 2 fence support with screws driven through the front. The fence support piece should run from the left end of the fence and stop short of the right–hand push bar block as shown in Figure 1. To make sure the fence is square to the fence support piece, include a couple of corner blocks in the assembly (see Figure 1).

Attach the fence assembly to the rest of the fixture by mounting a 3-1/2" door butt to the right–hand push bar block in such a way that the spine of the hinge projects past the front of the block slightly. Screw the other leaf to the back of the fence.

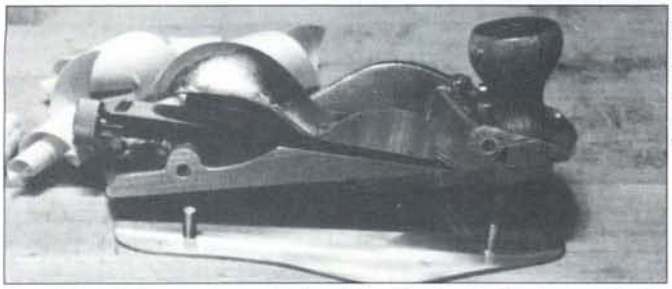
Figure 2 and the photo above left show the clever 90° positive stop that Phil designed. Cut a 3/4" X 1-1/2" X 1-1/2" mounting block and carefully drill it to accept a 1/4" T–nut; then drill two pilot holes for mounting it to the side of the left–hand push bar block. Position the mounting block about 1/4" back from the notch in the push bar block and attach it with glue and screws. Thread a 1/4" X 2-1/2" carriage bolt through the mounting block and fit a flat washer and a nut on the end. Bring the fence into position against the carriage bolt and mark where it hits; then tap a flat staple into the fence support piece at this point to provide a strike plate so the surface won't wear. Now, with the clamp in place and the fixture set up on the table saw, use a framing square to position the fence 90° to the blade. Secure it with the clamp and then adjust the carriage bolt and lock it in place by tightening the nut on the end.

Your sliding miter table fixture is ready to go. Use a sliding T–bevel to position the fence at whatever angle you need. Phil inscribed the base of his fixture with marks at common settings such as 15°, 30°, 45°, 60° and 75° angles; that way, he just has to swing the fence over to the appropriate line and clamp it. PW

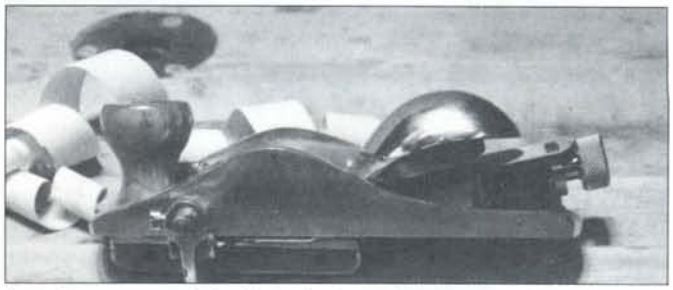
Figure 2. The 90° Positive Stop



illustrations by Tom Larson



photos by the author



Lie–Nielsen's bronze reproduction of the Stanley #140 skew angle block plane has a removeable side and a fence for use as a rabbet plane.

Some Special Planes

by Hugh Foster

Fine planes are probably not for you if all you want from woodworking is results. If the final product alone is your goal, use a router. Specialty planes are for folk who love wood, woodworking tools, shavings so thin you can see through them, and the whole ambience of a quality woodworking experience. Yes, the quiet of a hand tool shop is more Krenovian than a power shop, and, of course, there are things that can be done nicely by hand that we still can't even dream of doing with power equipment. Hand planing today is less popular "woodworking" than running a router, and this article's mission is, in part, to make quality woodworking time more popular. I'm going to talk about some of the finer specialty planes on the market and go on to make suggestions about how to purchase them for your tool chest.

Relatively new to the market is the Lie–Nielsen bronze reproduction of the long–discontinued Stanley #140 skew angle block plane. Like Lie–Nielsen's version of the Stanley #95 (reviewed in *PW*#40), which in a lot of ways it could replace, the #140 is heavy. Its weight may at first be disconcerting, for it's markedly heavier than the block plane that you've probably been using; indeed, it may be thrice the weight of the #95. After you get used to the weight and size, it feels really good in the hand. The #140 skew–cuts curly shavings, as does the #95. A comparison of the #140 with the Stanley #60-1/2, the regular block plane I've been using these many years, shows differences in weight, width, length, heft, and (sad to say) price. However, the differences go even further, because the #140 has a fence and a removeable side that allow it to be used as a rabbet plane.

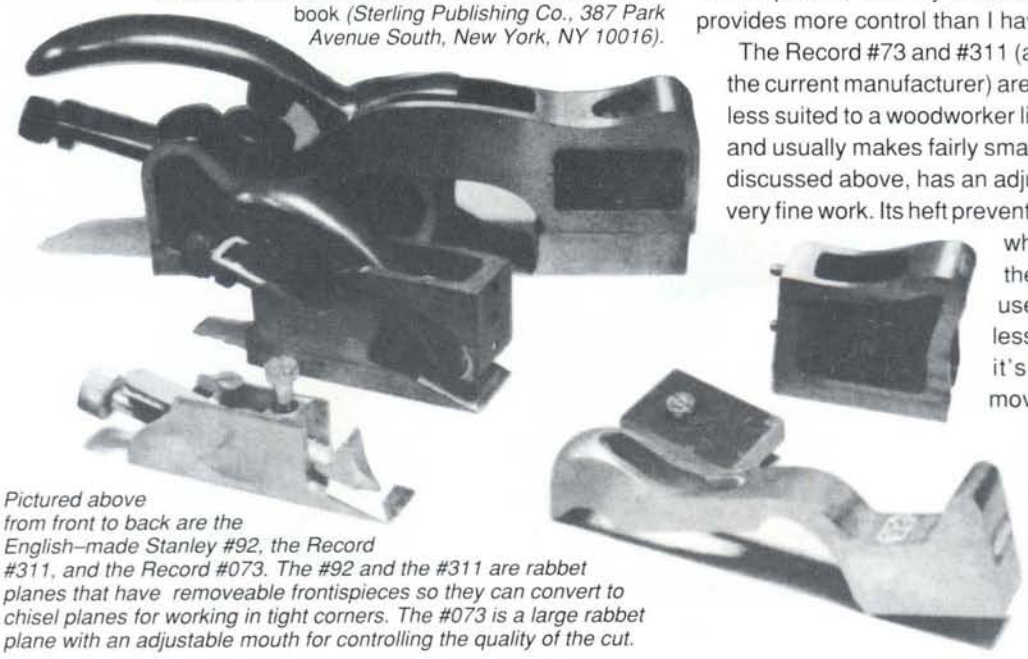
Over the years, I have made it a practice to buy a spare iron with more or less every plane. These spare irons prevent a lot of cursing—and at the tired end of the day, keep this woodworker from doing dumb things with dull tools. It's especially important to buy a spare iron with a plane like the #140. The skew cut is a bit harder to keep perfect, and, if woodworkers like you don't buy more of these planes, the manufacturer will have little incentive to continue producing this beautiful tool.

Among the popular bullnose and shoulder rabbet planes that I have found useful enough to add to my collection are the Marples/Record #073, #311, the English–made Stanley #92, and the newly reintroduced #410 and #420 Clifton versions of the old #041 and #042. Until Clifton brought back their handsome, nicely made renditions of what were once called the #41 and #42, the #92 was the smallest, lightest and most narrow of these rabbet planes, and my favorite for cleaning up joints since it provides more control than I have with a chisel.

The Record #73 and #311 (also numbered #3110 by Clifton, the current manufacturer) are both wider and heftier, and thus less suited to a woodworker like myself, who has small hands and usually makes fairly small projects. The #73, like the #92 discussed above, has an adjustable mouth and is capable of very fine work. Its heft prevents chatter when working in grains where this might be a problem, and the tool is, in general, a pleasure to use. In my shop, however, it seems less versatile than the #92 because it's narrower and lacks a removeable frontispiece.

The #311 can be three kinds of plane—like the #92 it can work in regular and chisel plane mode, though its blade angle is 20° instead of the 18° of the #92 or the 19° of the #73. And it can work as a bullnose plane when the appropriate frontis-

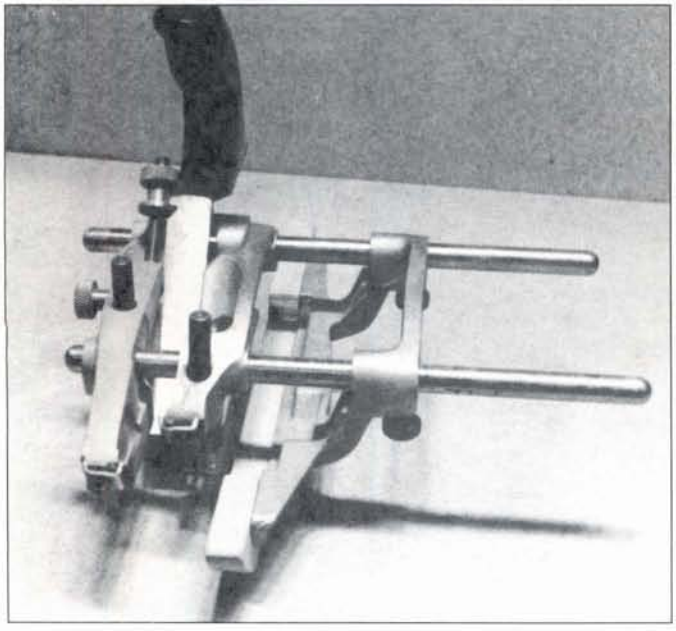
***Hugh Foster** is a part-time furniture designer/builder in Manitowoc, Wisconsin and the author of* The Biscuit Joiner Handbook *(Sterling Publishing Co., 387 Park Avenue South, New York, NY 10016).*



Pictured above from front to back are the English–made Stanley #92, the Record #311, and the Record #073. The #92 and the #311 are rabbet planes that have removeable frontispieces so they can convert to chisel planes for working in tight corners. The #073 is a large rabbet plane with an adjustable mouth for controlling the quality of the cut.

photos by the author

The Clifton #410 and #420 rabbet planes (above) are reproductions of the old Stanley #41 and #42. The Record #050C combination plane (below), accepts many different cutters for making mouldings or rabbets.



The Kunz palm plane and the Conover finger planes shown below are excellent for precise work on small pieces.

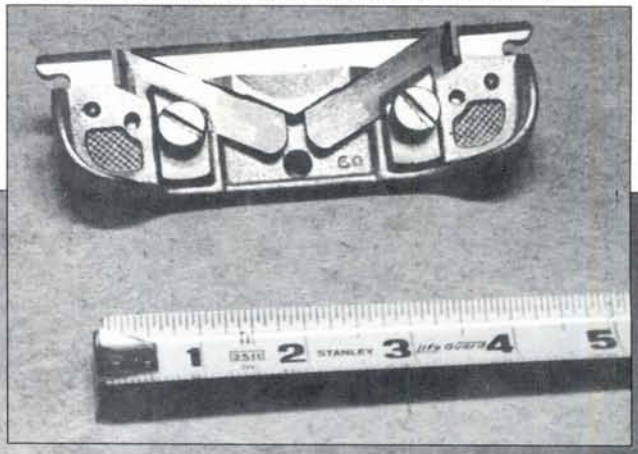
piece is fastened in place. Unlike the others, its mouth is fixed, and it is much too wide to permit the finest of work. The mouth width is the greatest drawback of the current production of this plane—perhaps a very old one will have been more precisely made. To me the #311 seems to be a "jack of all trades but master of none."

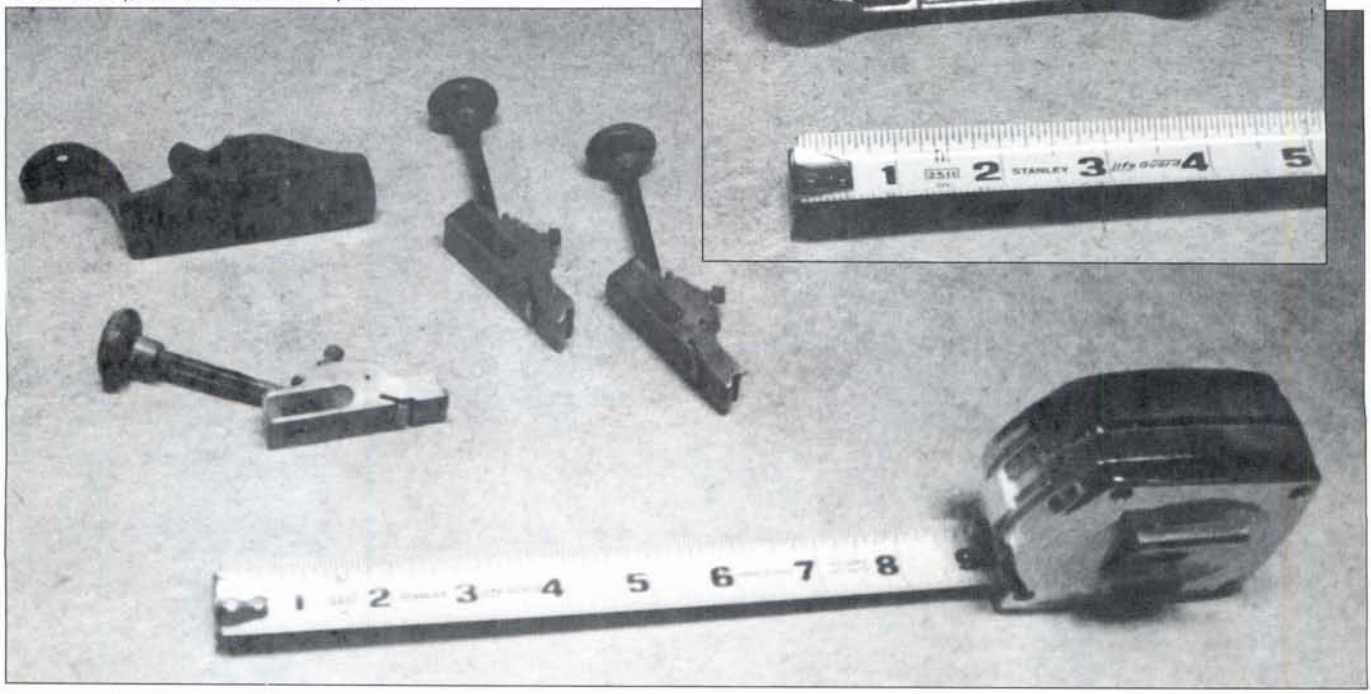
The #79 side–cutting rabbet plane is 5" long; it has a pair of 1/2" cutters so it can be worked in either direction. While most rabbet planes are used to make rabbets, dadoes and other ploughs deeper, this tool is used to make them wider. In my shop this plane isn't used often, but when it's needed, no other tool will do. I suggest that even if you don't need one right now, this would be a terrific time to put one on your shelf for that inevitable project that cannot be completed without it.

The cost of a Record #050C combination plane is dependent upon the collection of cutters that comes with it; the #050C will handle any cutter from the now-discontinued #405 multi–plane, except the sliding cutter. One of the most specialized of the specialty planes, this one is definitely for the woodworker who is willing to fuss and tinker with his tools in order to achieve perfection. This plane was affordable to me when the Record MultiPlane had just skyrocketed in price after having been withdrawn from the market. That heavier multi–plane is back on the market, and it probably makes more sense to an ardent plane lover than does my #050C. But if you need to hand plane only an occasional rabbet, bead, groove or ovolo edge in various widths, maybe the #050C will be close enough to perfection for you.

The very inexpensive Kunz palm plane—only 3-5/16" long with a 15/16" cutter—is a real pleasure to use for various kinds of

If you ever need to widen a dado or trim the shoulder of a rabbet, the Stanley #79 side–cutting rabbet plane is ideal for the job.



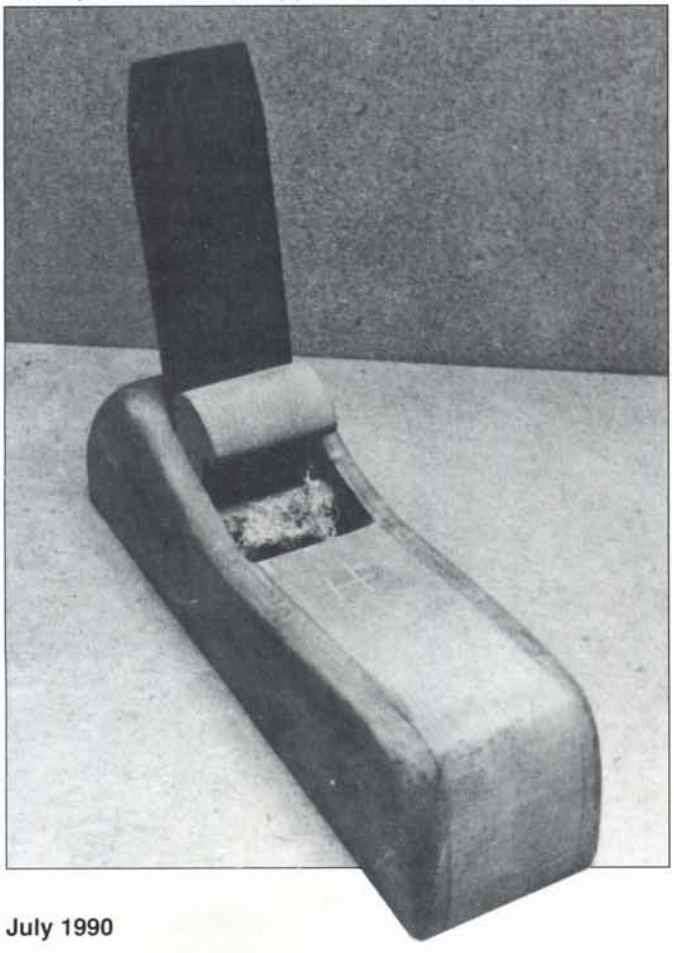


trimming. Conover finger planes with their 2-1/4" long bodies are precision investment cast, beautifully polished, and fitted with a warranted tool steel iron, but rabbeting blades are also available. These T–shaped blades extend flush with the side of the plane. For jobs like scooping out the sound board of a musical instrument there is a crosscut blade. It can be used only with the scrub model and is invaluable for the precise removal of large amounts of material from relatively small areas. These planes are indispensable for cabinet makers, model builders, instrument makers and furniture restorers.

Some would find fault with having so vast a collection of metal planes; after all, they claim, wood planes are superior in many respects. Krenov and other master craftsmen would have us make our own planes. Krenov's books detail the tasks of plane making, and I can tell you from personal experience that his planes are indeed a wonder to behold. A woodworker could probably present his handmade planes in lieu of recommendations when seeking employment. I'm including a photo of my own wooden plane to demonstrate that a woodworker with fairly ordinary skills can, in fact, fabricate a perfectly serviceable plane. Wood planes get a bit of fussing; after all, wood moves. When out of adjustment, wooden planes can be readily user–adjusted back to true—an act that's often a bit tougher with metal planes.

Buying a used plane at a garage sale or the like is a perfectly good idea. Not only will you save a bundle of cash, but the previous owner will likely have tuned the plane for use. If the quality of workmanship is really declining as some observers would have us believe, putting the old tool in order is often an easier task than making its new counterpart workable. And buying used ensures that we have the price of the spare iron, without which most planes are incomplete.

When you need a plane to perform a special task, it's often best to make it yourself. This toothing plane was made by the author.



The planes discussed here don't even begin to cover the full range, for each of the woodworking specialties has its own specialized collection. After you begin to use them, you will realize that hand planing is a far more satisfying, personally involving process than most of the powerized chores we do in the shop. And that's why I like to be in my shop. It's not really a question of what I make there, but a question of how I feel about what I do there. Planing to the rhythm of a Mozart concerto, for example, is a beautiful, almost spiritual experience. May hand planing alter the way you, too, view your shop. PW

Where to Get Them

The planes discussed in this article are generally availabe from several mail–order catalogs. The addresses for these companies are listed here, and each listing is followed by letters which identify the particular planes they carry, according to the legend below.

Conover Woodcraft Specialties, Inc. (M)
18125 Madison Road
Parkman, OH 44080

Garrett Wade Company (A, B, C, D, F, G, H, I, J, K, and L)
161 Avenue of the Americas
New York, NY 10013

Highland Hardware (D, F, G, H, I, J, and K)
1045 N. Highland Ave., NE
Atlanta, GA 30306

Lee Valley Tools, Ltd. (C, D, E, F, J, K, and L)
PO Box 6295, Station J
Ottawa, Ontario K2A 1T4
Canada

The Fine Tool Shops (D, E, L, and K)
Box 7091
Portsmouth, NH 03801

Woodcraft Supply Corp. (A, B, C, D, F, G, H, I, J, K, and L)
41 Atlantic Ave.
PO Box 4000
Woburn, MA 01888

Legend

A) Lie–Nielsen #140 skew block/rabbet plane
B) Lie–Nielsen #95 skew block plane w. integral 90° fence
C) Stanley #60-1/2 block plane
D) Marples/Record #073 rabbet plane w. adjustable mouth
E) Marples/Record #311rabbet/bullnose/chisel plane
F) Stanley #92 rabbet/chisel plane
G) Clifton #410 rabbet plane
H) Clifton #420 rabbet plane
I) Clifton #3110 rabbet/bullnose/chisel plane
J) Stanley #79 side–cutting rabbet plane
K) Record #050C combination plane
L) Kunz palm plane
M) Conover finger planes

Tricks of the Trade

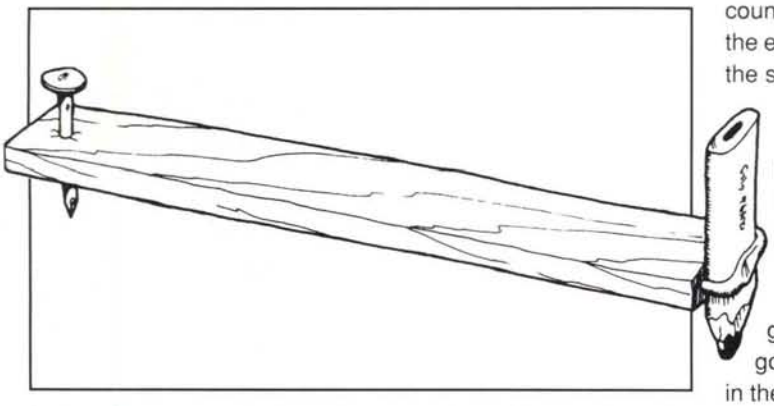
"Tricks of the Trade" shares readers' tips for making woodworking tasks easier and safer. If you've come up with a trick that would help other woodworkers, send it to "Tricks of the Trade, c/o Popular Woodworking, 1320 Galaxy Way, Concord, CA 94520. Include any photos or sketches that help illustrate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

Converting Augers for Drillpress Use

Perhaps you have a few auger bits laying around in the toolbox, superseded by power spade bits. Make them usable on the drillpress by filing or grinding off the spur tip. Do not remove the tip entirely, but very carefully file it into an unthreaded cone shape. Then cut off the square tang with a hacksaw, since a four–sided tang will not center properly in a three–jaw chuck. Dress the end smooth and chamfer the edges with a grinder. Check the nibs and lips of the cutting edges to be sure they're sharp. The converted auger is now ready for use, just be sure to run the drill press at lower speeds and don't feed the bit into the work too fast.

Quickee Beam Compass

While laying out a table top recently, I found it necessary to draw a 5' diameter circle on a number of 2 X 6 planks laid side by side. Ordinary pencils break too easily in making such circles. I



fastened a carpenter's pencil to one end of a 1 X 2 furring strip with a staple designed to hold romex electrical cable. A nail driven through the other end served as the pivot. My instant beam compass was accurate and easy to use, and the pencil lead didn't break once.

Tubular Blade Storage

Store your jigsaw blades where you can find them. Buy some 3/4" X 6" glass test tubes from your local pharmacy and make a rack to hold them near your jigsaw. Use one tube for each size saw blade, and label them with a tape writer.

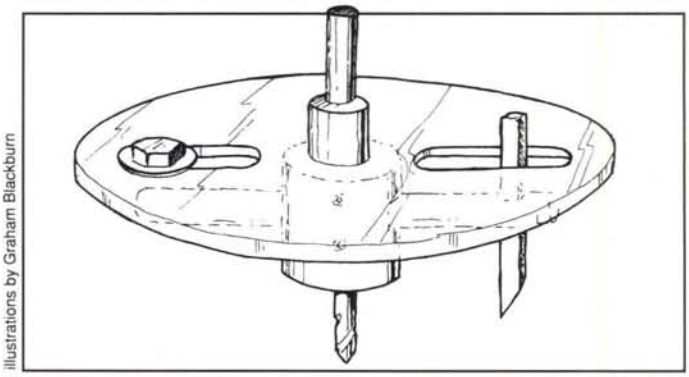
Putting Power Near the Work

My shop is a 10' X 9' shed, and my power tools are on casters so I can roll them out to the cement patio to work. Since my workbench is in the shed (and not on casters), I often use my table saw or the picnic table near by for a quickie work bench. I rewired the saw with 12 gauge heavy duty wire, and installed a duplex plug on the saw base. Now I can plug a saber saw, sander or what have you, into my already plugged–in table saw.

Don Kinnaman *is a retired high school woodshop teacher from Phoenix, Arizona and a frequent contributor to* Popular Woodworking.

Drill Press Flycutter Guard

Although the drill press fly or circle cutter is an indispensable tool for certain operations, it can be quite deadly. To improve the safety of the tool, I made a disk from 1/4" clear plastic sheeting, with a diameter large enough to more than encompass the outermost throw of the cutter bit. Make two slots in line with each



illustrations by Graham Blackburn

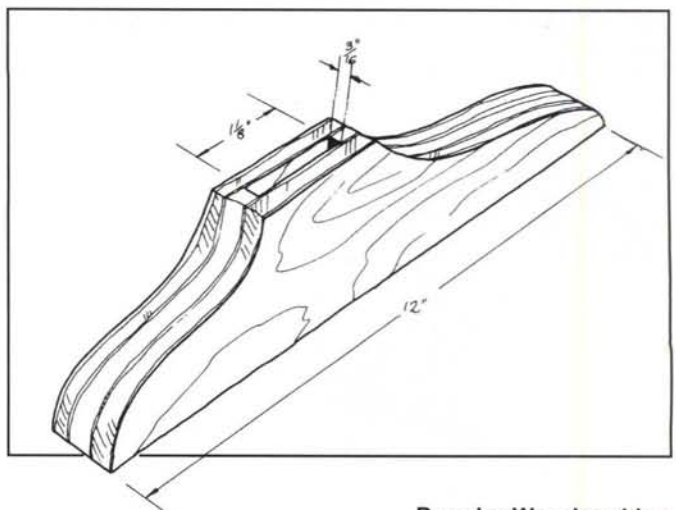
other, on opposite sides of the center, by drilling holes on the drill press. Cut the tangents between each pair with a sabre or scroll saw and bore a center hole to fit the shank. One slot permits adjustment of the cutter, while the other can be fitted with a counter–balancing bolt to offset the one–sided fly cutter. Polish the edge of the plastic or paint it red to keep the operator alert to the safety problem.

Hand Trimming

If you're working with a hand saw and need to trim just a hair off a piece of wood, clamp a piece of scrap to it, and saw through both the scrap and the good piece at the point of trim.

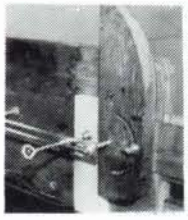
Lathe Depth Gauge

Check the depth of trays or bowls you're turning on the lathe with the movable ruler feature of this easy–to–make gauge. Laminate two pieces of 1/4" thick plywood (birch is good here) around two pieces of 3/16" thick paneling as shown in the drawing. The shape of the stock is not critical and can be designed to suit your needs. The slot should go all the way through and is designed to use a 12" length of yardstick, which is usually about 3/16" thick and 1-1/8" wide. You might keep the rule snug in its slot with a small wooden wedge, or even with a thumb screw threaded to lock it in position when necessary.



PW Showcase

order form on page 83



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

Lobo Power Tool Catalog

Lobo Power Tools

Lobo's woodworking machinery & accessories catalog features Lobo's full line of high quality products backed by Lobo's desire to provide customer satisfaction. $5 rebate with order!

Catalog $3.00

Please circle #102

Silvo Hardware

Silvo Hardware Tool Catalog

Professional quality tools for the woodworker, contractor, hobbyist, and homeowner. Over 4000 brand name tools and accessories. We offer selection, low prices, toll free ordering, and prompt, courteous service.

Free

Please circle #103

Julie's White House Originals

Southwest Wood Cutting Patterns

44–page book of exciting wood cutting patterns for pastel and primitive designs...Indian angels, dolls, signs. Pastel & jewel color painting instructions included.

$10.45

Please circle #104

Wedge Innovations

SmartLevel® Digital Level

Wedge Innovations' SmartLevel® measures all angles with up to 1/10 degree accuracy; automatically calculates percent slope and rise over run; can be recalibrated into perfect balance with the push of a button.

Free literature

Please circle #120

Appraise Your Tools

Antique Tool Price Guide

Old tools are hot collectibles. Big 236 page 9 x 12 value guide prices 6,000 items. 2,000 illustrations. Stanley, Bailey, Sargent, Diston, etc. 1840-1940. Adzes, planes, rules, wrenches, saws, etc.

$14.95

Please circle #122

Clayton Enterprises

Oscillating Spindle Sanders

For large or small shops. Ideal for contour sanding. Quick change drums from 2/3"to 4". Satisfaction guaranteed. One year warranty. Five models to choose from.

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-as-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

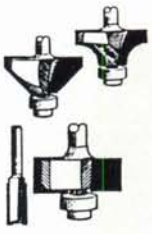
Popular Woodworking
Media Kit for Advertisers

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

PW Showcase

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

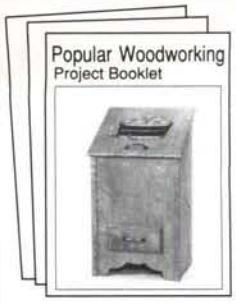
Japanese Tools

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.

Woodline Tool & Supply

$1.00

Please circle #181



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

Popular Woodworking
Project Booklets

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.

Econ-Abrasives

Free literature

Please circle #183

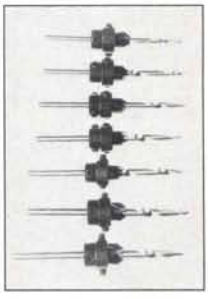
Tools & Accessories

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

Penn State Industries

Free

Please circle #184



HSS Tapered Drill Set

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

Dollar Trading Corporation

$33.99

Please circle #200

Learn Cabinetmaking 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.

Vidwood

Catalog $1.00

Please circle #210

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

Cascade Tools, Inc.

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.

Truly Persnippity

Free

Please circle #222

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.

Fine Tools Shop

$1.00

Please circle #225

Woodworking Supplies

Over 2500 useful woodworking tools, books and supplies. Also included: WOOD NEWS, our popular twice-yearly 48-page magazine chock full of helpful articles on getting the most from your woodworking tools.

Highland Hardware

Catalog $2.00

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.

Tole World
From the publisher of Popular Woodworking

1 year/$15.00

Please circle #228

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 #55 July1990

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. Bent Wood Indian Boxes
b. Mailbox Post
c. Plate Shelf
d. Carver's Mallet
e. Child's Desk
f. Bee Hive Jewelry Box
g. Miniature Mailboxes
h. Writing Table

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

a. Bent Wood Indian Boxes
b. Mailbox Post
c. Plate Shelf
d. Carver's Mallet
e. Child's Desk
f. Bee Hive Jewelry Box
g. Miniature Mailboxes
h. Writing Table

III. The type of woodworking I would most like to read about is:

a. Carving
b. Turning
c. Marquetry
d. Finishing
e. Small Projects
f. Furnituremaking

IV. The type of woodworking I would least like to read about is:

a. Carving
b. Turning
c. Marquetry
d. Finishing
e. Small Projects
f. Furnituremaking

V. What is your age?

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

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

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

VII. About how many projects do you build each year?

a. Under 5 b. 6-10 c. 11-15 d. 16-20 e. Over 20

Circle the catalogs and product information you want to receive:

101. $9.95	163. FREE	222. FREE
102. $3.00	164. $69.95	225. $1.00
103. FREE	165. $22.95	226. $2.00
104. $10.45	181. $1.00	228. $15.00
120. FREE	182. $8.00	270. $80.00
122. $14.95	183. FREE	280. FREE
123. FREE	184. FREE	330. $4.50
140. $94.00	200. $33.99	340. $17.00
161. FREE	210. $1.00	350. $30.00
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) $17.00 (circle 340 above)
❑ 2 years (twelve isssues) $30.00 (circle 350 above)

Total Amount for Cash Items Circled: _____

❑ Check Enclosed
❑ Visa ❑ MasterCard

Handling: $2.00

Total Payment Enclosed: _____

Card # _____ Exp. _____

Signature (required) _____

Name _____

Address _____

City, State, Zip _____

Coupon Expires September 15, 1990

Calendar

Events of Interest to Woodworkers

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.

Arkansas

Date: May 26-July 22
Event: International Turned Objects Show
Location: Arkansas Art Center, Little Rock
This juried selection of notable lathe-turned works from around the world premiered in 1988 at the Port of History Museum in Philadelphia, and is now touring North America through January 1991
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

California

Date: June 9-16
Event: Building the Herreshoff Pram with Simon Watts
Location: San Francisco
For information, contact: National Maritime Assoc., Bldg. 275, Crissy Field, San Francisco, CA 94129. Tel. (415) 929-0202

Date: June 23-24
Event: California Carvers Guild Woodcarving Show
Location: Fashion Fair Mall, Fresno
For information, contact: Dennis Pettinelli, 4736 E. Clinton, Fresno, CA 93703. Tel. (209) 456-1461

Date: June, July & August
Event: Workshops
Basic Carving 6/4-15, Tools & Techniques 6/25-7/13 & 7/23-8/10, Weekend Seminar with James Krenov 7/21-22
Location: Fort Bragg
For information, contact: College of the Redwoods Woodworking Program, 440 Alger St., Fort Bragg, CA 95437. Tel. (707) 964-7056

Date: July 13-15
Event: Wood Fair
Exhibits of fine woodworking of all kinds plus industry exhibits
Location: Eureka
For information, contact: Gary Peterson, College of the Redwoods, Eureka, CA 95501. Tel. (707) 445-6912

Date: July 19-21
Event: Crafts Show
Location: Anaheim Convention Center
For information, contact: Buyers Market of American Crafts, 3000 Chestnut Ave., #300, Baltimore, MD 21211. Tel. (301) 889-2933

Date: July 28-29
Event: California Carvers Guild Woodcarving Show
Location: Panorama Mall, Panorama City
For information, contact: CCG, Plaza del Cavalier, Suite 9, 250 San Simeon Ave., San Simeon, CA 93452. Tel. (805) 927-4718

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

Colorado

Date: June, July & August
Event: Workshops in Woodworking & Furniture Design
Location: Snowmass Village
Thirteen separate courses with such masters as James Krenov, Tage Frid, Sam Maloof, Nora Hall, Alan Peters.
For information, contact: Anderson Ranch Arts Center, Box 5598, Snowmass Village, CO 81615. Tel. (303) 923-3181

Connecticut

Date: May 5-June 24
Event: Shaker Styled Furniture Exhibition by Ian Ingersoll
Location: South Norwalk
For information, contact: Brookfield/SoNo Craft Center, 127 Washington St., South Norwalk, CT 06854. Tel. (203) 853-6155

Illinois

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

Iowa

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

Maine

Date: July 28-August 4
Event: Building the Nova Scotia Skiff *Sea Urchin*
Location: Rockport Apprentice Shop
For information, contact: Rockport Apprentice Shop, Rockport, ME (207) 236-6071

Maryland

Date: June 10-16 & 17-23
Event: Summer Carving Workshops
Location: Salisbury
For information, contact: Christine Brown, Salisbury State University University, Salisbury MD. Tel. 1-880- 742-4988

Massachusetts

Date: June 22-24
Event: Crafts Show
Location: Bayside Expo Center, Boston
For information, contact: Buyers Market of American Crafts, 3000 Chestnut Ave., #300, Baltimore, MD 21211. Tel. (301) 889-2933

Date: July 21-22
Event: Berkshire Crafts Spectacular
Location: Fairgrounds, Great Barrington
For information, contact: United Craft Enterprises, Box 326, Masonville, NY 13804. Tel. (607) 265-3230

Minnesota

Date: July 21-27
Event: Upper Midwest Woodcarver's Exhibition
Location: Fairgrounds, Blue Earth
For information, contact: Harley Schmitgen, 311 E. 14th St., Blue Earth, MN 56013. Tel. (507) 526-2777 or 2250

New Hampshire

Date: July 22-26
Event: Woodworking Retreat
Location: Waterville Valley Resort & Conference Center
For information, contact: WANA, Box 706, Plymouth, NH 03264. Tel. (800) 521-7623

Date: August 4-12
Event: 57th Annual Craftsmen'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: June 16-17
Event: Art & Crafts Show
Location: Brookdale Park, Montclair
For information, contact: Rose Squared Productions, 12 Galaxy Ct., Belle Mead, NJ 08502. Tel. (201) 874-5247

New York

Date: June 14-17
Event: Sixth Annual National Conference
Location: Rensselaer Polytechnic Institute, Troy
For information, contact: Timber Framers Guild of North America, Box 1046, Keene, NH 03431. Tel. (603) 357-1706

North Carolina

Date: June 11-22
Event: Class: Furniture Design
Location: Penland
For information, contact: Registrar, Penland School, Penland, NC 28765. Tel. (704) 765-2359

Date: June, July & August
Event: Wood Classes
Woodworking 6/25-7/6, Furniture from the Source 7/9-20, Furniture 7/23-8/8, Design in Wood 8/13-24
Location: Penland
For information, contact: Registrar, Penland School, Penland, NC 28765. Tel. (704) 765-2359

Date: June, July & August
Event: Workshops
Ladderback Chairmaking 6/25-30, Scandinavian Woodcraft 7/9-13, Adv. Scandinavian Woodcraft 7/16-20, Windsor Chairmaking 7/30-8/4, Swiss Cooperage 8/13-18
Location: Marshall
For information, contact: Drew Langsner, Country Workshops, 90 Mill Creek Rd., Marshall, NC 28753. Tel. (704) 656-2280

Oklahoma

Date: July 6-8
Event: 14th Annual Woodcarving Festival
Location: Kensington Galleria Shopping Mall, 71st & S. Lewis, Tulsa
For information, contact: Oran Hoover, 4721 S. 27 W. Ave., Tulsa, OK 74107. Tel. (913) 466-7470

Oregon

Date: June & July
Event: Workshops
Bent Lamination Model Designing 6/18-22, Oval Nantucket Lightship Baskets, 6/20-22, Woodcarving 7/23-27
Location: Portland
For information, contact: Oregon School of Arts & Crafts, 8245 SW Barnes Rd., Portland, OR 97225. Tel. (503) 297-5544

Date: July 20-27
Event: Salem Art Fair & Festival
Location: Salem
For information, contact: 600 Mission St. SE, Salem 97302

Date: July 21
Event: First Annual Hardwood Craftshow
Location: Hardwood Industries, Inc., Bend
Display tables available until July 15.
For information, contact: Ken Matthews, 16974 Cagle Rd., Lapine, OR 97739. Tel. (503) 536-1970.

Pennsylvania

Date: June 22-24

Event: Symposium: Use of the Lathe: Ideas for the Classroom

Demonstrations & instruction for educators with Albert LeCoff, Rude Osolnik and others

Location: The George School, Newton

For information, contact: Wood Turning Center, Box 25706, Phila., PA 19144. Tel. (215) 844-2188

Tennessee

Date: entry deadline June 30

Event: Woodturning: Vision & Concept II

Competition in conjunction with AAW's 4th symposium

Location: Gatlinburg

For information, contact: Arrowmont School, Box 567, Gatlinburg, TN 37738. Tel. (615) 436-5860

Date: June, July & August

Event: Woodturning Workshops

Design in Turning 6/18-22, Woodturning 6/25-7/6, Bowl Turning 7/9-13, Furniture Off the Lathe 7/16-27, Sculptural Vessels 7/30-8/3, Hollow Vessels 8/6-10

Location: Gatlinburg

For information, contact: Arrowmont Summer Wood Workshops, Box 567, Gatlinburg, TN 37738. Tel. (615) 436-5860

Virginia

Date: June 19-August 19

Event: Exhibit: 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: June 7-July 29

Event: Exhibit: Wood Sculpture by Michael Davock

Location: Issaquah

For information, contact: Northwest Gallery of Fine Woodworking, 317 NW Gilman Blvd., Issaquah, WA 98027. Tel. (206) 625-0542

West Virginia

Date: June, July & August

Event: Augusta Heritage Arts Workshops

Treenware 7/8-13, Chip Carving 7/29-8/3, Whittling & Folk Carving 8/5-10, Guitar Construction 7/8-20, Dulcimer Construction 8/5-10, Fiddle & Bow Repair 7/29-8/3, White Oak Basketry 8/5-10, Log Construction 7/22-8/3

Location: Elkins

For information, contact: Davis & Elkins College, Elkins, WV 26241-3996. Tel. (304) 636-1903

Canada

Date: June 23-30

Event: Building the Nova Scotia Skiff *Sea Urchin*

Location: Duncan, Vancouver Island

For information, contact: Keith Sandilands, Cowichan Wooden Boat Society, Box 787, Duncan, Vancouver Island, B. C. V9L3Y1. Tel. (604) 746-5789

Date: July 7-14

Event: The Chamberlin Dory–skiff

Location: Fairview, Alberta

For information, contact: Burt Reynolds, Box 3000, Fairview, Alberta T0H1L0. Tel. (403) 835-6616

Date: August 11-October 7

Event: International Turned Objects Show

Location: Canadian Museum of Civilization, Ottawa

Notable lathe-turned works from around the world

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

"It's a hope chest; he hopes it turns out OK."

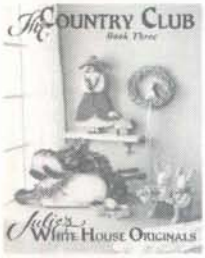
Index to Advertisers

The Country Club Book Series

Book One
Whimsical Rabbits, English Couples, a Handsome Rabbit Hutch, Rocking Horse . . . 18 designs

Book Two
Elegant Angels, Door Santas, Ornaments, Antique Signs and warm Pine decorating pieces.

New For Christmas
Christmas Special
Sleighs, Santas, Signs . . .
Pine House Shelves
Elegant Ornaments
Carolers, Victorian Houses
I Love the
Angels and the
Lacy Ladies and you will too!



Book Three
Unforgettable Tulip Mirror, Shepherdess and Sheep, Farmer Bunnies, Bunny Signs. A real delight.

Book Four
Joyous Nativities, Dear Snow Deer, Swan Sled and silly Santas . . . all with sparkle and shine and rich warmth for the Holidays. 15 designs.

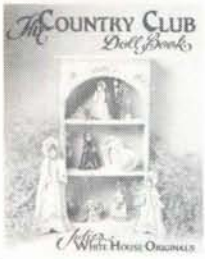
All things Special for Wood Cutting and Acrylic Painting

Each book is a unique collection of designs from Country French, Victorian, Country and Contemporary. Each has over 15 designs with complete finishing instructions.

Wood brochure included with order.

Each Delightful Book is **$8.95** Plus $1.50 Postage

Outside the U.S. add . . .2.50 postage (U.S. Funds)



New For Spring
The Doll Book
Special Edition of Dolls and Roses. Victorian and Country, plus decorative Tables and Mirrors.

New For Spring
The Tulip Garden
Pastel Pine Pieces for home decorating plus Bunnies, Shelves and flowers, flowers, flowers!

Send check with order to:

Julie's White House Originals
2115 E. Edgewood - Dept. 3, Springfield, MO 65804

Please contact local Shops or Distributors or write White House Originals

Professional Quality Woodworking Machines From *PENN STATE INDUSTRIES*

Free plans for roller stand with purchase of rollers

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

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**

Add $20 UPS Freight

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.**

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

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**

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)

MARKETPLACE

CLASSIFIED

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

SALE: MOVEABLE LOUVRE SHUTTER manufacturing equipment. Standard slats. Reasonable. 1-714-849-3808

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. 777, 230 Woods Lane, Somerdale, NJ 08083

VON FANGE CABINETMAKER'S HAMMER for professional wood craftsmen. Beryllium copper, 12 oz., dealer closeout, $24.95 ppd. Check/MO to Poxon Ent., Box 751062, Petaluma, CA 94975-1062. (707) 763-5332

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

FOAM "BRUSHES." Ideal for paints, varnish, stain. Smooth, no bristles. Request free catalog, special stirrer. LADCO, Box 612-PW, Leominster, MA 01453

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

PLANS AND KITS

STORAGE SHED—Prints, instructions, material list, everything, only $14.95 ppd., Z & B Innovations, Box 2745, Binghamton, NY 13902

CRAFTSMEN—Learn solar woodburning. Add unique touch to furniture, create exciting wall plaques. Complete instructions. Send $3, M. Childs, 7597 Scotland Rd., Akron, NY 14001

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

100 FULL–SIZE WOODCRAFT PATTERNS: Windmills, Birdhouses, Toys, Etc. $4.50. Catalog alone $.50 Hayes Patterns, 6E Willow Street, Woburn, MA 01801

BANDSAW PUZZLE PATTERNS. Packet includes 20+ original animal designs, transfer paper, production advice, money–making scrap ideas. Explains non–toxic finishes, safety, more. $5.00 plus $1.25 postage. Mindy's Puzzles, Box 176PW, Elk City, ID 83525

DIY PLANS FOR INDOOR/OUTDOOR furniture, workbench, children's toy, 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

BESTSELLING BANDSAW TOYS! Unique new designs: 1957 Corvette, 1957 Chevy, 1935 Auburn, Jeep, Pickup—Full size patterns: $2.00 each—All five: $8.00. 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. Planfan, Box 473, Bridgeport, NE 69336

WOOD WHIRLIGIGS. Full–size patterns, instructions. Wind–driven 13"–22" bee, chipmunk, dog, coyote, roadrunner, cat, songbird, duck. $3.25 each; any four, $12.00; all eight, $23.00. P. Skov, 3380 Fourth Ave., #26, Yuma, AZ 85365

UNUSUAL BUTTERFLY PATTERNS, clowns, wall plaques, book racks, etc. Send $1.00 for brochure. Happy Beaver Woodworkers, P. O. Box 5142, Sta. 1, Roseburg, OR 97470

VICTORIAN GINGERBREAD and screendoor patterns. Great moneymaker. 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-2), Stone Mountain, GA 30083

COLLAPSIBLE WOODEN SAWHORSE PLANS—Journeyman carpenter tired of fighting storage and hauling of conventional sawhorses invented this new system. No parts to lose. One hand carries set. Lightweight for hauling. Hang flat on wall for storage. Add plywood, instant table. Perfect for interior finish work. Build for self or for sale. Complete plans, materials list and easy–to–follow instructions, $5.00 (ready–made $99.00) cash, check, money order, Visa/Master. Western Mt. Art, Inc., Box 320 H, Joseph, OR 97846

BACKYARD SUMMER ENTERTAINMENT Build and play BEANBAG game. Fun for young and old. Safe alternative to horseshoes or jarts. SASE and $3.00 for plans and rules: Evans Enterprises PW, RR2, Box 65B, Francesville, IN 47946

CAROUSEL LOVERS—build your own table–top carousel, size 17" X 19". Patterns and plans, $12.75. D. J.'s Woodshop, R. R. 2, Box 38, Amherst, NE 68812

"WELD" YOUR OWN BAND SAW BLADES KIT— $15.00. Plans $3.00. 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

MARKETPLACE

CLASSIFIED

CRAFT PATTERNS: Coyotes, cactus, etc. Free chile patterns. Send $1.95 for catalog. Southwest Patterns, Box 1851, Ruidoso Downs, NM 88346

DINOSAUR BONE CREATURES, T. C. Collectables, plans $5.95 up. Kits—up to 5 feet tall! Precut wood. Decorative, unique, educational. Indoor–outdoor, school, office. Free brochure! Write: John Generali, 12 Royal Palms Dr., Austin, TX 78744

HARDWOOD BACKHOE—Test your toy building skills by building this complicated model. Warning: not for beginners. Full plans $20.00. Send money order to Bradley Toys, General Delivery, Hagar, Ontario, Canada P0M 1X0

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. CRAFTER'S, 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: Croffwood Mills, RD #1 Box 14L, Driftwood, PA 15832

SELECT AND BETTER HARDWOODS: Walnut—National Average 4.32/bf; OUR PRICE 3.22/bf; Cherry—N. A. 2.98/bf; OUR PRICE 2.07/bf; Hard Maple—N. A. 2.04/bf; OUR PRICE 1.58/bf. Catalog $1.00. MasterCard/Visa. Badger Hardwoods, Rt. 1, Box 262, Walworth, WI 53184

TURNING BLOCKS, BURLS, CROTCHES—imported/domestic. Send $1.00 and SASE for brochure to: Wood–Ply Lumber, 100 Bennington Ave., Freeport, NY 11520. (516) 378-2612

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

FIGURED MAPLE—QUILTED, BURL, CURLY, SPALTED. Boards and Blocks. Alaskan Yellow Cedar. Randle Woods, P. O. 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

FREE CRAFT LUMBER! Yes! In your area! New handbook tells how! Satisfaction guaranteed. Send $6 today. Milworth, 29620 Green, Borden, IN 47106

BOOKS AND CATALOGS

WOODWORKING VIDEOS. Beginning to advanced. Catalog $1.00. DRTV Dept. P, Box 3539, Napa, CA 94558

WOOD PARTS, CRAFT SUPPLIES CATALOG $2.00. Little Shepherds, Dept PW, 9658–E W. Chatfield Ave., Littleton, CO 80123

LEATHERCRAFT GUIDE—new 64 page wholesale catalog. $2 (refundable!) Leather Unlimited, PW 0290, Belgium, WI 53004-9990

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 CATALOG! Wood project books and plans. Stanford Publications, Box 912W, St. Joseph, MI 49085

CUT MELAMINE PARTICLEBOARD WITHOUT CHIPPING using your hand power saw. No turnover or blade change required. Nothing to buy. Send $5.00 MO to start cabinetmaking now. Riadel P/L, 8 Carmichael St., Ivanhoe, Victoria, Australia, 3079

BOOK SHOWS YOU HOW TO SELL WHAT YOU MAKE. Covers selling, pricing, credit, everything. Satisfaction guaranteed. $5.00. Inprint, Box 687PW, Farmingdale, NJ 07727

FREE ILLUSTRATED CATALOG of very fine woodworker's hand tools, books, and accessories. Highest quality craftsman tools from Primus, Adjustable Clamp, Sorby, Marples, Sandvik, Bessey, and many other manufacturers at prices you can afford. Kreative Link, Department PW2, Box 2347, Sandy, UT 84091

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

MISCELLANEOUS

WOOD FAIR '90—Woodworking displays & demonstrations—July 13-15, College of the Redwoods' *campus, 7 miles* south of Eureka. Free parking & admission. (707) 445-6966

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.

(WA) 5 MINUTE EPOXY GLUE,1:1 ratio. Half pint kit $9.00, pint $16.00, quart $30.00. Postpaid! System Three Resins, Box 70436, Seattle, WA 98107

EPOXY! EPOXY! EPOXY! Laminating, Decoupage, Repair and Assembling epoxies. 16oz/$10.00, 32oz/$17.00. HCH COMPOUNDS, 11455 Newkirk/1420, Dallas, TX 75229. (214) 243-8494

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

(IN) CROIX THE ULTIMATE low pressure spray system, 85% less overspray. Lacquers, enamels, polyurethane spray easily. Complete hose, gun, turbine. Croix, 513 Hawthorne, Fort Wayne, IN 46806. (219) 745-2678. (0088399)

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

MARKETPLACE

MISCELLANEOUS

SPRAY-ON SUEDE LINING: Finish any project with a soft touch. Free Brochure with sample. DonJer 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

PEEL AND STICK MEASURE TAPE. Great for pattern making, material cutting, templates, etc. 3/4" X 100' roll $5.95. Alaskan Seals, Box 1544, Kenai, AK 99611-1544

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-D Shoreham, Toledo, OH 43612

ADVERTISE FREE in national magazines, newspapers, postcard decks and package inserts. $8.95 Directory, Specialties, Box 2053, Kensington, MD 20891

(GA) IF WE LIKE YOUR NEW PRODUCT IDEA we'll develop, produce, promote, market it paying you a royalty. No cost to you. Write for confidentiality agreement & details first. Craftmark, Box 6308PW, Marietta, GA 30065. (0091024)

EARN BIG $$$ WITH YOUR PROJECTS! Proven book tells how! Guaranteed satisfaction! Order now! Only $5.00! ALCO, 2030 Danforth PW, OR 43618

GUARANTEED WORK! EXCELLENT PAY! Easy work—assemble simple products at home. Information 904-686-3634 ext. 7210

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 yearly. Free recorded message: 707-448-0270. (KC1)

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.

Out of the Woodwork

continued from page 90

embarrassed to admit how many times I have "awakened" to discover that I am on cut number twenty-seven and not number six. How I got this far I do not know, but the subsequent dose of adrenaline is usually enough to keep me on tack.

How to avoid boredom? Avoid lengthy repetitions of the same task. Break up the monotony. Do several series of alternating processes. Spell yourself so that you aren't lulled. Most of all, be aware that you are subject to boredom. Know this beforehand and the knowledge will allow you to focus on the boredom and suppress it.

Another major detractor of concentration is haste. No one is so organized, so methodical, so self-managed, that haste has never touched them. Either self-imposed or factual, deadlines can loom on the horizon like locusts. Deadlines, as they approach, elevate anxiety. Anxiety generally manifests itself as haste.

Haste at the work level not only diminishes your possibilities for perfection, but it increases risk. You risk not only the work, but also yourself. No deadline seems worth the cost of a personal injury. To recommend that you plan ahead is a little too precious—too thin on reality and too thick on sermon. And, after all, deadlines are what make the world go 'round.

Take a moment to look at what you do in your shop. Fully three-quarters of your enjoyment, enthusiasm, and satisfaction are derived from how you work. Cutting a tight-fitting joint, smoothing a board, delicately shaping a handle are not only a means of communication, they can sometimes *be* the communication. You shortchange yourself and your work if you allow anything to interfere. You risk much more if you allow anxiety and haste to control your work.

The last detractor from your concentration on working safely is timidity. Timidity is that vague and nebulous feeling that lies somewhere between caution and fear. Caution allows you to proceed. Fear denies you access. Timidity vacillates between the two, and therein lies the problem.

To be used effectively, a tool must be used with confidence. Dangerous tools (and most are dangerous), have to be used with a confidence tempered with caution. If the tool is an old and trusted comrade, your confidence is lightly tempered with caution. You know *the tool's* limitations. You know your limitations. Caution is the balance. If the tool is new to you, you are looking for the limitations. This is good. Caution is a little stronger than confidence. Caution is there to guide you, to let you discover the limitations.

Timidity appears when you relinquish both confidence and caution and succumb—if only for an instant—to fear. Fear precludes either confidence or caution. More important, fear precludes control. Without the control, you react instead of act.

Timidity is not exclusively the dilemma of the beginner in a particular field. My own personal nemesis is the shaper. Equipped with a large, panel-raising bit turning at 12,000 rpm, the machine howls. And though I have made thousands of passes by the bit, I am never at ease. The sound, the vibration, the mounds of shavings verge on overwhelming. I am cautious... very cautious. I know the machine; I even teach people how to use it. Still, I am cautious. Fences are twice checked. The arbor nut confirmed tight. Elevation locked. A few hand rotations of the spindle. A short burst of power to be certain that everything functions under power. At this point I am better. The timidity is under control. While I am more confident of myself, I am no less respectful of the machine. Satisfied that the machine will do what is expected of it, I can focus on what I expect of myself.

Knowledge, concern, and deliberate action directed toward ensuring safety, all tend to diminish the fear and the timidity and reduce it to a healthy caution. But if the fear remains—and you must be willing to admit fear—*do not use the tool.* There are always other ways.

Safety is not something you wear or a poster that hangs on the wall. The finest equipment in the world will not protect you absolutely. Safety has to be a part of how you work—an attitude. It has to be a sense of order that organizes the processes and allows you to focus on the work. Safety establishes the boundaries of caution that allow you that focus. PW

by J. Petrovich

An Attitude

Safety is all too often something that is set aside and separate from our activities *in the shop*. We own safety glasses, face shields, dust masks, respirators, ear protectors, and other devices. We are armed for safety. We interpose an instrument of protection between ourselves and harm's way. Safety, as such, becomes an additive, a protective mantle that you come to depend upon. This is unfortunate.

I do not mean to minimize the importance of protective equipment. My own eyes have been saved several times, and my lungs, liver, and kidneys are probably no worse for the work I have done, thanks to protective equipment. But protective equipment is only one part of safety.

Most of you have met people at social gatherings who have, when you were identified as a woodworker, looked at you with an all too familiar look. And you inevitably responded by holding out both hands and saying "Still got 'em all," while you wiggled your fingers in proof. (That is, if you actually do still have them all.) People expect you to be missing fingers. Like the scarred cheek of a swordsman or the wooden leg and patch of a pirate, we expect that missing fingers go with the trade. It is, for some reason, believed to be unavoidable and inevitable. We will be maimed.

This is too fatalistic and too morose an attitude to live and work with. Certainly the machinery that you use can be dangerous, even deadly. But the equipment is not inherently dangerous until you turn it on and misuse it. In all the years that I have spent living and working around "dangerous equipment," I have seen only two accidents that were directly attributable to equipment failure. One was a parachute that failed to open and the other was a grindstone that disintegrated. Every other accident was directly attributable to the operator—the person who made the decision about where, when, and *how* the equipment was to be used.

If you take the perspective that operator error is the root of most accidents, safety must take on a different aspect. If you had no choices about where, when, and how to use your equipment, then protective equipment would be your only salvation. You would be like a bumper car, hurtling and bumping your way through a short, miserable, whiplashed life. Fortunately, you have choices. More important, you have control. Control is there for the taking. The choice is yours.

Taking control requires a conscious effort. You need to think through procedures from beginning to end, no matter how often you've done them. It seems easy, but there are pitfalls. They are not insurmountable, but they can be insidiously subtle, like the mesmerizing, steady, almost soothing sound of a table saw that you have used for twenty years—so familiar, so reliable and yet, if misused, so catastrophic.

The first of these pitfalls is boredom. Boredom more regularly attacks those who have lots of experience. You have performed a procedure hundreds, if not thousands, of times. You know how to do it, how to control the machine, how to control the material, how to move your hands, and where to stand. You do your part and the machine does its part. Your eyes are open and you are seeing—but you are not watching. If you are lucky, at some point something startles you and you realize what you are doing. I am

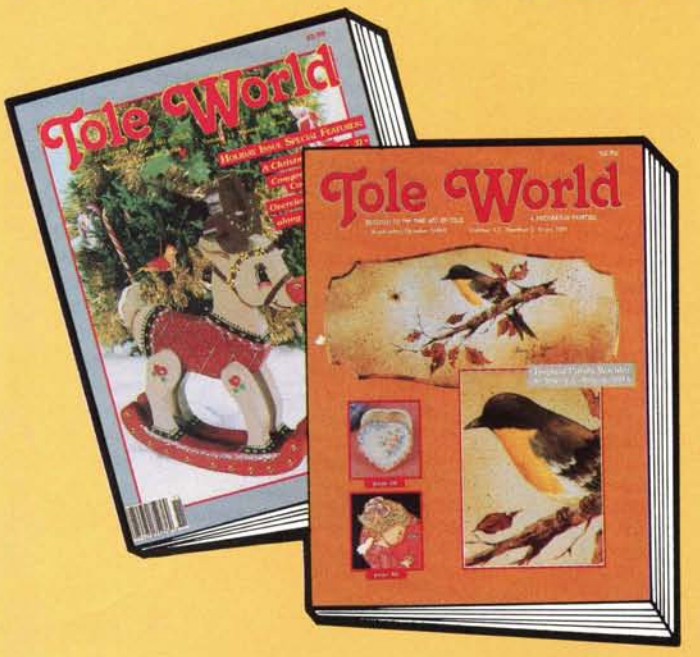
continued on page 89

Joe Petrovich *is an instructor in mill cabinet technology at Hartnell College and owner of Connemara Mills, an exotic hardwood lumberyard in Salinas, California. He is also the author of* Custom Tools for Woodworkers: Designing and Making Your Own *(Stackpole Books, PO Box 1831, Harrisburg, PA 17105), from which this essay was excerpted.*

"This grandfather clock kit is complete, even to the mouse."

TOLE WORLD

Inspired finishes for your woodworking projects . . .



Just a little paint can add the perfect finish to many of your special woodworking projects! *TOLE WORLD* magazine is packed with ideas to brighten up your gifts, decorate handsome accents for your home, and even increase your wood sales.

In each issue you'll find 8 to 10 great painting projects that are sure to please your family and friends. Colored photos, full-size patterns, and complete step-by-step instructions assure successful results.

With all the care you put into making beautiful wood projects, why not let *TOLE WORLD* help you give them that extra finishing touch?

Subscribe today!

Guarantee: If at any time, for any reason, you're not satisfied, tell us to cancel and we'll send an immediate, unquestioned refund covering the balance of your subscription.

Lots of Family Fun!

Paint a storage chest with a faux finish.

A sled, a sconce, a bench, and a churn become beautiful accents for the home with these decorative finishes.

☑ YES, please enter my subscription for *TOLE WORLD*.

❑ **$15 for one year (six issues)** ❑ **$28 for two years (twelve issues)**

Foreign subscriptions add $5 per year. Payment in U.S. funds only.

❑ Payment enclosed

❑ I prefer to charge my order:

❑ **MasterCard** ❑ **VISA** **Exp. Date** _____

Card No. _____

Signature _____

Name _____

Street _____

City/Town _____

State/Zip _____

Mail to:
***Tole World*, PO Box 52995, Boulder, CO 80322-2995**

Phone (415) 671-9852

5CYA9

Next Time

Ken Sadler

Deborah Porter

Coming up in the September Issue of *Popular Woodworking*:

Deborah Porter

Log Turning
Roadrunner Whirligig
Piano Music Box
Utility/Serving Cart
and much more...

On sale in early August.

Hugh Williamson