

# The Woodworker's Journal

Vol. 16, No. 4

## CLASSIC Lawn Glider

Build this summertime  
special from  
low-cost lumber

- Finishes  
for Maple
- Tabletop  
Fastening
- All About  
Cordless Tools

**Bonus!**  
**3**  
**Shop  
Projects**

**Plus! 7 Project Plans:** Side-by-side Chest/Cupboard  
Candle Holders • Remote Rack • Belt Buckle & Bolo  
"Big Rig" Tractor/Trailer Toy • Aeolian Wind Harp

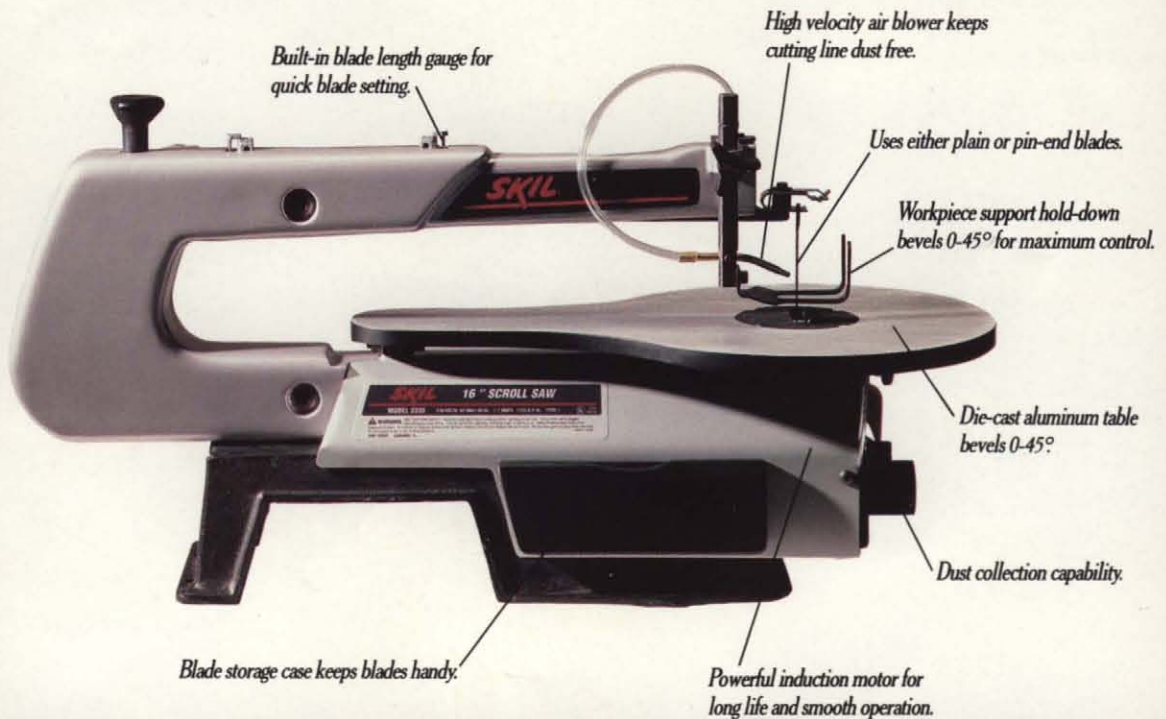
\$3.95 (Canada \$4.50)

July/August 1992





# Its Distinguishing Features Are Only Surpassed By Its Distinguished Name.



The advantages of the new Skil scroll saw extend beyond those fine points noted above. Also of considerable value is our reputation for creating power tools that meet the most demanding of standards.

This scroll saw and the other members of our new family of benchtop tools are the most recent examples of the Skil commitment to quality. It's a distinguishing feature, we might add, that can't be found in any other benchtop line.

**SKIL**  
The Benchmark In Benchtop.™



Skil Corporation, Subsidiary of Emerson Electric Co., 4300 West Peterson Avenue, Chicago, IL 60646. © 1992 Skil Corp.



# The Woodworker's Journal

JULY/AUGUST 1992 VOLUME 16, NUMBER 4

## C O N T E N T S

### DEPARTMENTS

- 4 Shoptalk
- 6 Letters
- 8 Events
- 12 Product News
- 14 Readers' Information Exchange
- 15 In The Shop  
*The Cordless Tool Revolution*
- 22 Finishing  
*Finishes for Maple*
- 39 Weekend Woodshop

### TECHNIQUES

- 10 Shop Tips
- 26 Woodworking Basics  
*Joining Tops to Tables and Case Pieces*

40  
*Tractor/Trailer Toy*



36  
*Aeolian Harp*



*Grinder Stand* 56



46  
*Belt Buckle & Bolo Set*

### PROJECTS

- 30 Lawn Glider
- 36 Aeolian Harp
- 39 Candle Holders
- 40 "The Big Rig"  
Tractor/Trailer Toy
- 44 Audio/Video Remote Rack
- 46 Western-style Belt Buckle and Bolo Set
- 50 Side-by-side Chest/Cupboard
- 56 3 Space-saving Projects for the Shop

50  
*Side-by-side Chest/Cupboard*







# Shoptalk

## Summer Solace

We heard you! After years of readers suggesting that we publish plans for an old-fashioned lawn glider, this issue features a glider that's really worth the wait. With or without the optional canopy sunshade, this glider will be the focal point of any backyard. Settle down with a good book and an iced tea and enjoy.

We're always trying to give you more information with our projects, and high on our list has been to include more cutting diagrams. The lawn glider is constructed almost entirely of common construction lumber and our What To Buy illustration shows exactly what you'll need from the lumberyard. Don't be intimidated by the size of this project; the construction is very straightforward and not really that difficult.

If workshop projects are high on your list of favorite things to build, then you won't want to miss our trio of space-saving shop projects, all sharing a clever Lally column mounting system. We've made a real commitment to workshop projects and jigs, and we'll have at least one featured in all our future issues.

## For Lathe Buffs

Nick Cook's woodturning articles and the accompanying plans have turned out to be a real hit. Although MSC Industrial Supply, the supplier of the Morse taper collets for the collet turning article in our May/June issue, is temporarily out of stock, you can obtain the collets directly from Nick (tel. (404) 421-1212). The good news is we've got another Nick Cook turning article, about vacuum turning, lined up for our big September/October issue. Don't miss it.

## Wisdom of the Ages

A self-described "ancient" subscriber laughingly explained to Maureen in our Circulation Department his subscription renewal philosophy: "Only renew for one year at a time. Two years would be fine, except at my age, I hate to even buy green bananas . . ."

But another equally ancient subscriber stated that he has every intention of woodworking until he's 100 and insisted we give him a 10-year subscription rate.

Have a nice summer.

# The Woodworker's Journal

*Editor and Publisher* **James J. McQuillan**

*Managing Editor* **Thomas G. Begnal**

*Associate Editor* **David F. Peters**

*Copy Editor* **Kimberly Gellatly**

*Contributing Editors* **Jim Barrett,**

**Rick and Ellen Bütz, R.J. DeCristoforo,**

**Dennis Preston**

*Art Director* **Dan Thornton**

*Associate Art Director and*

*Photographer* **Michael Gellatly**

*Designer/Craftsman* **Mark J. Ziobro**

*Circulation/Promotion*

*Manager* **Lynne Streeter**

*Subscriptions*

**JoAnne Finkle, Maureen Murphy-Gereg**

*Distribution* **Patricia Malumphy**

*Computer Operations*

*Supervisor* **Kathy Shook**

*Office Manager* **Patricia McLean**

*Advertising Manager* **Lynda Morris**

*Advertising Sales*

**Dan Ramage, Carolyn Ray,**

**Renee Jaunsem**

**Pattis/3M**

7161 North Cicero Avenue

Lincolnwood, IL 60646

Tel. (708) 679-1100; Fax (708) 679-5926

*Subscription Department*

**The Woodworker's Journal**

P.O. Box 1629

New Milford, CT 06776

Tel. (203) 355-2694

**The Woodworker's Journal** (ISSN 0199-1892) is published bi-monthly in January, March, May, July, September and November by The Madrigal Publishing Co., Inc., P.O. Box 1629, New Milford, CT 06776. Telephone: (203) 355-2694.

Printed in the United States of America

Copyright 1992 by The Madrigal Publishing Co., Inc. No part of this publication may be reproduced by any method without permission from the publisher.

Second class postage paid at New Milford, CT 06776 and additional offices.

Subscription Rates: In the United States and its possessions — One year (6 issues): \$17.95; Two years (12 issues) \$31.90. Canada — One year \$27.77 (CAD), includes 7% GST; Two years \$48.10 (CAD), includes 7% GST. Foreign countries — One year \$25.00 (USD); Two years \$44.00 (USD).

*To Subscribe, Renew or Change Address:* Write to **The Woodworker's Journal**, P.O. Box 1629, New Milford, CT 06776, including mailing label for renewals and changes. For gift subscriptions, include your own name and address as well as those of gift recipients.

*Postmaster:* Send Change of Address to **The Woodworker's Journal**, P.O. Box 1629, New Milford, CT 06776.

Materials submitted for editorial consideration will be treated with care while in our possession, but we cannot assume responsibility for loss or damage.

U.S.A. Newsstand Distribution by Eastern News Distributors, Inc., 1130 Cleveland Rd., Sandusky, OH 44870.

Photo Credits: *Tom Barrett*, pp. 22-25; *John Kane/Silver Sun Studios*, pp. 62-63.



# GRIPMASTER

## The Portable All-Purpose Clamping System



### KIT INCLUDES

- 1 — Clamping Unit
- 1 — End Stop / Third Jaw
- 2 — Bench Clamps
- 2 — Centers
- 2 — Soft Jaws (upper)

### SPECIFICATIONS

- |                           |                                     |
|---------------------------|-------------------------------------|
| Castings                  | — Magnesium Alloy.                  |
| Rods, Screws and Bushings | — High Carbon, Nickel Plated Steel. |
| Quick Release Bushing     | — Bronze.                           |
| Weight-Basic Kit          | — 8 Lbs. 7 oz.                      |
| Accessory Kit             | — 2 Lbs. 9 oz.                      |
| Bench Clamps              | — Minimum opening — 5/8".           |
|                           | — Maximum opening — 2 15/16".       |

**\$169.95**

**Bench Vice**

**Low Jaw Grip**

### GRIPMASTER Accessory Kit

An 11 piece accessory kit specially designed for the GRIPMASTER. This kit nearly doubles the versatility of the clamping system.



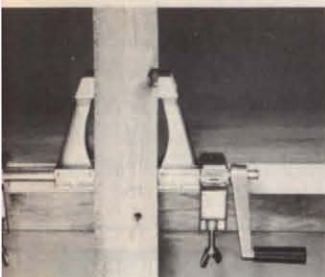
### KIT INCLUDES

- 1 - Drill Holder
- 1 - Drill Adapter Ring
- 2 - Pipe Jaws
- 2 - Metal Jaws
- 2 - Soft Jaws (Lower)
- 1 - Turntable
- 2 - "T" Bolts

**\$79.95**

**End Stop Grip**

**Bar or Sash Clamp**

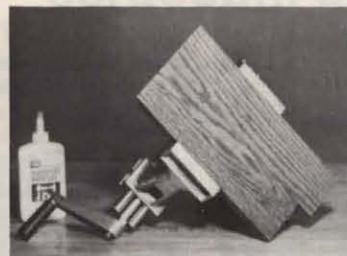


**Turning Centers**

**C-Clamp**

**Soft Jaws**

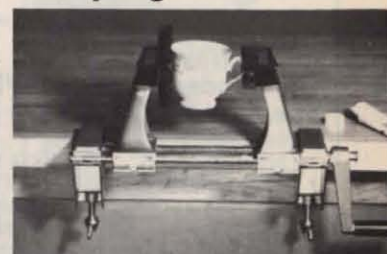
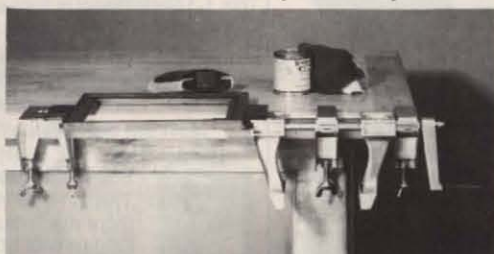
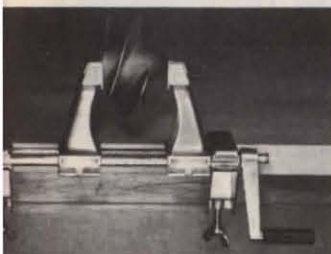
**Bench Clamps**



**Aluminum Jaws**

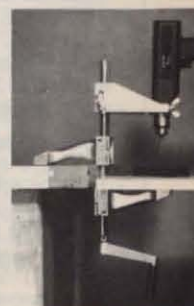
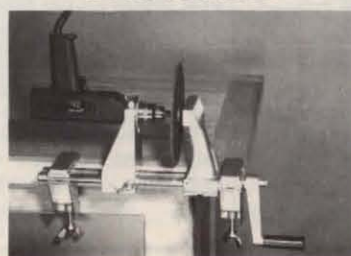
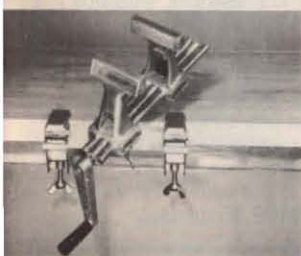
**Soft Jaws (Lower)**

**Tube Clamping Jaws**



**Bench Pivot**

**Drill Holder**



### Manufacturer's Lifetime Guarantee

*If any part of the Gripmaster becomes damaged, when used for the purpose intended, the damaged part will be repaired or replaced without charge for as long as you own the tool. Simply return the damaged part to the address below.*

TO ORDER CALL OR WRITE:  
**CLARK NATIONAL PRODUCTS, INC.**  
5234 SOUTH PROCYON AVENUE • LAS VEGAS, NEVADA 89118  
800-999-4009





# Letters

We welcome opinions and comments (both pro and con) from our readers. Address correspondence to: Letters Department, *The Woodworker's Journal*, P.O. Box 1629, New Milford, CT 06776.

I'm making the Sideboard Chest from your March/April 1992 issue. On page 40, the instructions read, "You could cut the dovetails by hand, but the best tool for the job is the router and an adjustable dovetail jig, such as the Leigh dovetail system."

Cutting the pins with the Leigh jig is not a problem as my workbench is 32 in. high, but cutting the tails is a different ballgame. How do you cut the tails on a board that is 62 in. long using the Leigh jig?

John Plank, Waupun, Wisc.

We checked with Gene Cosloy, builder of the chest. Gene tells us that to cut the tails he attached his Leigh jig to a wall shelf securely mounted about 5 1/2 ft.

above the shop floor. This provided enough room for the 62 in. long top and bottom. He was then able to make the cuts while standing on a sturdy stepstool. For safety, have someone alongside to keep you steady while making the cuts standing on the stepstool.

The Shop Workcenter in the January/February 1992 issue is a really practical idea. The multipurpose design will be helpful as I plan our outfeed table.

I realize that the plastic laminate surface needs to be flat, smooth and unobstructed when the Workcenter is used as an outfeed table. But would it be possible to design a removable insert (even if it required a few minor changes) so a router could be inverted under the top surface? The Workcenter could then serve as a handy router table with a large work surface.

Dick Dorn, Woodworking Instructor  
Oelwein Community Sr. High School  
Oelwein, Iowa

The Workcenter is well suited to serve as a router table. You'll need to purchase or make a drop-in sub-base and locate it between the vertical dividers. Use the sub-base as a template and scribe its profile on the laminate top, then use the router and a mortising bit to mortise for the sub-base. When dropped into place, the sub-base must be flush with the surrounding surface.

A fence can be added without much fuss. It's length should equal the 24 3/4 in. width of the Workcenter, and it should be notched at the edges so a pair of C-clamps can be used to securely hold it in place. And, as another option, you can also rout a slot across the top to accept a standard miter gauge.

If you plan on including the router before starting the project, it would be a good idea to increase the space between the vertical dividers on either side of the bay. That will provide greater access to the router, making it easier to change bits and make adjustments.

## Quality Woodworking Machines at Affordable prices from Penn State Industries

Dept. J, 2850 Comly Road • Phila, Pa 19154 • Info: 215-676-7609

Order Toll Free 1-800-288-7297 • Visa, Master, & Discover Cards accepted

When ordering - Add UPS Shipping Charges as noted • Pa residents add 7% Sales Tax

Call or Write for our New 24 Page Color Catalog



### Two Way Sanders

#### Features of both models:

- Dust collector on belt
- Tables tilt to 45°
- Sealed ball bearings
- Easy belt tracking

#### 6x9 Sander:

- Includes stand
- 9" Disc • 6"x48" Belt
- 3/4 HP, 1720 RPM
- Free Belts & Discs worth \$21.00

#S69 ... \$219.95 (UPS \$30)

#### 4x8 Sander:

- 8" Disc • 4"x36" Belt
- 1/3 HP, 1720 RPM
- Free Belts & Discs worth \$14.00

#S48 ... \$109.95 (UPS \$8)



### Super 125 Planer

only \$359.95

This machine will pay for itself time and again by planing your own wood. Finishes wood like machines many times its price.

- Portable at 65 lbs
- 26.2 fpm power feed
- HSS Knives 12-1/2" wide
- Motor: 16Amp, 8000RPM 2HP, 115V
- 1/8" Max depth of cut

#PLA ... \$359.95 (UPS \$15)

Extra Knives ... \$25/pair

Dust Chute ... \$15/ea (UPS \$3)

Stand ... \$39/ea. (UPS \$6)



### Variable Speed Scroll Saw

only \$169.95

Cuts intricate patterns in many different materials. Electronically controlled motor gives full power at all speeds 400-1800cpm.

#### FREE ACCESSORIES:

- Dust blower • 1 dz blades
- EZ Set permanent top arm blade holders • EZ jig to attach standard holders • 4 blade holders • Neptune 1-1/2" lettering guides w/6 patterns

#### Specifications:

- Motor: 1.3 Amp, 110V
- Throat: 15" deep • Stroke-3/4"
- Tilt 0-45° left • Cut Depth: 2"
- Blades: uses pin & plain end

#SVS ... \$169.95 (UPS \$10)



### Dust Collectors

#### 750 CFM Portable Dust Collector:

This 1-1/2HP model is lightweight and portable at less than 50 lbs.

- 1-1/2HP, 110/220V • 1 outlet @ 4" • 1 Bag @ 20 gal • Wt: 46 lbs • 750CFM • Free: 8' of hose, 1 ea 4" to 3", 1 ea 4" to 2" adaptor.. \$15Value

#DC3 ..... \$209.95 (UPS \$10)



#### 900 CFM Dust Collector:

This 1-1/2HP model allows for use in 2 or more machines & gives improved service for long runs of hose.

- 1-1/2HP, 110/220V • 2 outlets @ 4" • 2 Bags @ 30 gal • Wt: 120lbs • 900CFM • Free: 50' of hose, 1 ea 4" to 3", 2 ea 4" to 2" adaptors.. \$40Value

#DC2 ..... \$299.95 (UPS \$30)

#### 610 CFM Dust Collector:

This collector is perfect for hook-ups to almost any single machine.

- 1HP, 110/220V • 1 outlet @ 4" • 2 Bags @ 20 gal • Wt: 75lbs • 610 CFM • Free: 8' of hose, 1 ea 4" to 3" & 4" to 2" adaptors.. \$15 Value

#DC1 ..... \$199.95 (UPS \$20)



I've noticed that your readers are oftentimes looking for parts for older Sears tools. I've found that many of the old parts are still available if you can provide Sears with a part number.

Joseph Cote, Dracut, Mass.

I really enjoy doing fretwork. Recently, I came across a fretwork clock and decided I would like to build one. Have you seen plans for such a clock?

John Edwards, Toronto, Canada

*Reidle Products, Box 661, Richland Center, WI 53581 (tel. 608-647-2777), has a catalog devoted exclusively to fretwork patterns and supplies. It includes more than two dozen clock plans.*

In 1958, I bought a used Shopsmith Mark V along with an operating manual titled "Power Tool Woodworking For Everyone" by R.J. DeCristoforo. It was an excellent guide for the Shopsmith and the best user's manual I've ever read.

Recently, while pondering how best to add a larger table and several fence attachments to my band saw, your March/April issue arrived. In it was "A Universal Band Saw Jig" written by R.J. DeCristoforo. It was just the information I needed.

I'm so pleased that Mr. DeCristoforo is still turning out his excellent articles. To me, he has been an outstanding woodworker for over 35 years, but, of course, you already know that.

Lee E. Warren, Sun City, Ariz.

As a recently retired Boston police officer, I have much more time to devote to woodworking (my favorite hobby), so I promised to make something special for my grandchildren.

The perfect gift for my granddaughters was the Classic Colonial Dollhouse (November/December 1991). It made me the "best grandad ever" in their hearts. And in the same issue, I found that the Heirloom Toy chest was just the

right present for my grandson. Keep up the great work, guys and gals.

Robert W. Tonsberg, Hyde Park, Mass.

**Your safety is important to us...** We strive to present our plans and techniques as accurately and safely as possible, and we try to point out specific areas and procedures where extra caution is required. But because of the variability of local conditions, construction materials and personal skills, we can't warn you against all potential hazards. Remember to exercise common sense and use safety measures when operating woodworking power equipment. Don't attempt any procedures you're not comfortable with or properly equipped for. Sometimes, for the sake of clarity, it's necessary for a photo or illustration to show power tools without the blade guard in place. In actual operation, though, you should always use blade guards and other safety devices on power tools that are equipped with them. Remember... an ounce of prevention really is worth a pound of cure.

—The Editors

## WAGNER

### SPRAY Fine Finishes with the New WAGNER Fine Coat Low Overspray Finishing System



only **\$179<sup>99</sup>**

HVLP High Volume Low Pressure. The Ideal "Fine Finishing Tool." Great for applying Varnishes, Stains, Lacquers and water based finishes!

## PHONE

**1-800-776-5467**

- ☐ Check ☐ MasterCard  
☐ Discover  
☐ Visa (Please include exp. date)  
PA residents add 6% sales tax.  
S & H: Under \$30 - add \$3.75.

## SUNGOLD

### SANDING BELTS Buy 12 Belts Get 13 FREE!



#### You've Tried the Rest NOW BUY THE BEST!

65% polyester, 35% cotton, belts don't stretch, sand cooler, and stay sharper longer.

| BELT<br>SIZE | PRICE/25<br>or 13" Belts |
|--------------|--------------------------|
|--------------|--------------------------|

|            |         |
|------------|---------|
| 1 x 30     | \$17.99 |
| 1 x 42     | 18.99   |
| 2 1/2 x 16 | 18.99   |
| 3 x 18     | 18.99   |
| 3 x 21     | 19.99   |
| 3 x 24     | 20.99   |
| 4 x 21     | 25.99   |
| 4 x 21 1/4 | 25.99   |
| 4 x 24     | 26.99   |
| 4 x 36     | 25.99   |
| 6 x 48     | 36.99   |

Available in 40, 60, 80, 100, 120, 150 and 220 grit. Please order in multiples of 5 per grit size.  
Belt Cleaning STICKS...\$4.99  
3 for \$9.99 6 for \$15.99

BUY 6  
GET 7  
FREE

## Our Gift To You...

### FREE SHIPPING

on orders over \$30.00  
(Continental U.S. only!)

OFFER GOOD TIL  
AUG. 31, 1992

## PHONE

**1-800-776-5467**

**QUAKER STATE  
WOODWORKING  
SUPPLY** 4434 Kutztown Rd.  
Reading, PA 19560

## QUICK-GRIP

### BAR CLAMPS



JAW OPEN PRICE EA

|     |         |                |
|-----|---------|----------------|
| 6"  | \$12.75 | SPECIAL OFFER! |
| 12" | \$14.95 | FREE Shipping  |
| 18" | \$15.95 | with orders    |
| 24" | \$17.75 | over \$30      |
| 36" | \$19.75 |                |

## "SINGLEY"

### Sleeveless DRUM SANDERS

|                            |         |
|----------------------------|---------|
| 3/4" x 3" Long             | \$15.95 |
| 1" x 3" Long               | 14.95   |
| 2" x 3" Long               | 18.99   |
| 3" x 3" Long               | 19.99   |
| Kit of all 4               | 64.99   |
| Drum Sander Plans          | 11.99   |
| 3" x 10" Pre-Cut Sandpaper |         |
| Roll Assortment            | 12.99   |

### Strong "F" Weight SANDPAPER

3" x 10" rolls that  
outlast regular sand-  
paper 3X. Assortment  
pack of 1 each...80,  
120, 220...\$12.99

## TRU-GRIP

### CLAMP 'N TOOL GUIDE Bar Clamping Straight Edge



Power Tool Guide, Instant  
Fence, Assembly Clamping,  
Corner Clamping, No Cranks,  
No Screws.

|          |         |
|----------|---------|
| 24" Grip | \$22.95 |
| 50" Grip | 29.95   |



### Back-To-Back BENCH CLAMP

Instantly turns Bench-Top  
into a "Super Capacity"  
Workholding System.  
18" Grip...\$31.95  
36" Grip...39.95

## PORTER-CABLE

### RANDOM ORBIT SANDERS



P-C MODEL  
#7334, 7335,  
7336

|                      |          |
|----------------------|----------|
| 5" Random Orbit      | \$119.99 |
| 5" V.S. Random Orbit | \$129.99 |
| 6" V.S. Random Orbit | \$134.99 |

(Sanders shipped freight FREE!)

**New!** DUST COLLECTION  
for P-C Random Orbit  
Sanders. The RIGHT WAY to DUST  
COLLECT...hood connects your  
sander to your Shop-Vac. 6' Flex  
Hose included...\$26.99



(Fits both 5" and 6" Sanders)



### BULLDOG GOLD

### RANDOM ORBIT DISCS

EXTRA Heavy Duty "D" weight.

Buy 50, Get 50 FREE!!!

|                  |         |
|------------------|---------|
| 5" Bulldog Discs | \$20.99 |
| 6" Bulldog Discs | \$25.99 |

(Available in 80, 100, 120, 150,  
180, 220, & 320 grits.)





# Events

We will gladly list as many events of interest to woodworkers as space permits. Listings are free and may include shows, fairs, competitions, workshops and demonstrations. The deadline is eight weeks before publication—March 1 for the May/June 1992 issue. Please address announcements to the Events Department. Readers planning on attending events should call ahead if possible. Scheduled dates and locations sometimes change between publication and the date of the event.

**California:** ACC Craft Fair, "Pacific States Craft Fair," Fort Mason Center, San Francisco, Aug. 7-9. For information, call 1-800-836-3470.

**Colorado:** Workshops at the Anderson Ranch Arts Center, Snowmass Village include: Marquetry, Veneering and Inlay with Silas Kopf, Jul. 6-10; Furniture with Sam Maloof, Jul. 25-26. For information call (303) 923-3181.

**Connecticut:** 35th Annual Guilford Handcrafts Exposition, Jul. 16-18, Town Green, Guilford. For information call (203) 453-5947.

**Minnesota:** 10th Annual Upper Midwest Woodcarvers' Exhibition, Jul. 25-31, Blue Earth. For information contact Harley Schmitgen at (507) 526-2777.

9th Annual Villa Maria Woodcarvers' Workshop, Aug. 9-15, Old Frontenac. For information call (612) 827-6590.

**New Jersey:** Classes at the Peters Valley Craft Center include Carving Cabriole Legs and Ball & Claw Feet, Jul. 17-19; Lamination Techniques for Furniture, Aug. 1-4; Dovetailed Box, Aug. 7-11; Marquetry, Aug. 14-18; Making an Acoustic Guitar, Aug. 21-28. 22nd Annual Peters Valley Craft Fair, Jul. 25-26. For info, call (201) 948-5200.

**North Carolina:** Workshops at Country Workshops, Marshall: 17th Century Joinery, Jul. 6-11; Toolmaking for Woodworkers, Jul. 20-24; Windsor Chairmaking, Aug. 3-8; Ladderback Chairmaking, Aug. 17-22; Japanese Woodworking, Aug. 31-Sep. 4. For information call (704) 656-2280.

For information on Penland's Summer Workshops, contact the Penland School, Penland, NC 28765; tel. (704) 765-2359.

**Oklahoma:** The Eastern Oklahoma Woodcarvers Association's 16th Annual

Show, Jul. 10-12, Tulsa Promenade Shopping Mall, Tulsa. For information call (918) 242-3621.

**Pennsylvania:** For information on woodcarving workshops at the Sawmill Center for the Arts, Cooksburg, call (814) 927-6655.

**Tennessee:** For information on woodturning classes for July and August, and the Summer Faculty and Staff Show, through Aug. 14, at the Arrowmont School of Arts and Crafts, Gatlinburg, call (615) 436-5860.

**Vermont:** Classes at The Fletcher Farm School for the Arts and Crafts, Ludlow: Power Carving for Beginners, Jul. 20-24; Introduction to Bird Carving, Jul. 11-12; Woodcarving with Power Tools, Jul. 13-17; Figure Carving, Aug. 10-14 and Aug. 17-21. For information call (802) 228-8770.



## It's Your Turn!

### Record

Coronet CL-3... The latest Woodturning Lathe for the professional or craftsman.

Heavy Duty cast iron head and tail stocks combined with the 1 1/2" diameter solid twin bed bars reduce vibration to a minimum.

The adjustable main bearing is silent running, unlike roller bearings. The rotating head stock allows face plate turning up to 30" diameter (with optional bowl attachment).

Features 5 speed Poly "V" Drive, and continuously rated 3/4 H.P. TEFC motor. Between centres capacity available in 36" or 48".

See these and other great Record Tools at your Dealer today!



RECORD TOOLS INC.  
1915 Clements Road, #1, Pickering, Ontario, Canada L1W 3V1  
Telephone: (416) 428-1077 Fax: (416) 428-7555

USA Toll Free: 1-800-267-8367  
Canada Toll Free: 1-800-263-7512



ROUTER TABLES • INCRA • ABRASIVES •

## FREE CATALOG

### OVER 2000 ROUTER BITS, SHAPER CUTTERS & ACCESSORIES

Send today for your FREE copy of our 64 page catalog. The industry's largest selections of American made bits. The finest quality backed by the best guarantee in the business! Over 600 photos and technical illustrations. Over 600 new items. Many exclusives and hard to find items!



To Order Call TOLL FREE  
1-800-872-2511 or write:

**EAGLE**  
AMERICA

124 PARKER COURT, P.O. BOX 1099  
CHARDON, OHIO 44024



BOOKS • COUNTER SINKS & DRILLS

ROUTER BITS • SHAPER CUTTERS • FORSTNER BITS

UNIQUE ACCESSORIES • ADHESIVES • PLUG CUTTERS



# MAKE BEAUTIFUL RAISED PANEL DOORS WITH YOUR . . . 1/4" or 1/2" ROUTER . . . 1/2" or 3/4" SHAPER

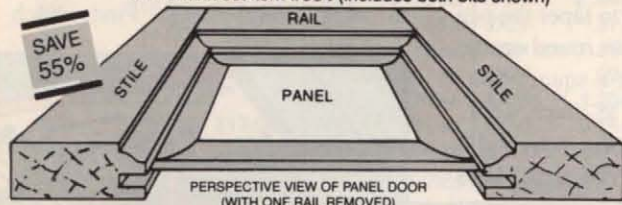
Professional production quality bit makes it quick and easy to produce matching rails and stiles — the panel raising bit with ball bearing guide makes the raised panel perfect every time.

**SALE PRICE** **\$69<sup>95</sup>** Regular value over \$150.00!

1/4" Shank set item #554 (includes both bits shown)

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

Shaper Cutters set:  
Item #1059  
**SAVE! only \$99.95**  
Set Rail & Stile & Raised Panel Cutters



PERSPECTIVE VIEW OF PANEL DOOR  
(WITH ONE RAIL REMOVED)

**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



**CARBIDE TIPPED ROUTER BITS • PROFESSIONAL PRODUCTION QUALITY GUARANTEED**  
WHEN ORDERING ANY THREE OR MORE **DEDUCT \$1.00 EACH** • **FREE SHIPPING IN CONTINENTAL U.S.**

| ITEM NO. | BEST CUT BEST PRICE | DESCRIPTION        | ANGLE/DEPTH/RADIUS CIRCLE DIAMETER | LARGE DIA. | CUTTING LENGTH | SHANK SIZE | PRICE   |
|----------|---------------------|--------------------|------------------------------------|------------|----------------|------------|---------|
| #601     | Solid Carbide       | 1/8" Spiral Cutter |                                    | 1/8"       | 1/2"           | 1/4"       | \$ 9.00 |
| #603     |                     | 1/4" Spiral Cutter |                                    | 1/4"       | 3/4"           | 1/4"       | \$12.00 |
| #903     |                     | 1/4" Spiral Cutter |                                    | 1/4"       | 3/4"           | 1/2"       | \$12.00 |
| #904     |                     | 3/8" Spiral Cutter |                                    | 3/8"       | 1"             | 1/2"       | \$24.00 |
| #905     |                     | 1/2" Spiral Cutter |                                    | 1/2"       | 1 1/2"         | 1/2"       | \$29.00 |
| #530     |                     | 3/16" Edge Beading | 3/16" Dia. of Circle               |            | 1/2"           | 1/4"       | \$15.00 |
| #531     |                     | 5/16" Edge Beading | 5/16" Dia. of Circle               |            | 1/2"           | 1/4"       | \$15.50 |
| #350     |                     | 1/8" Round Over    | 1/8" R                             | 3/4"       | 3/8"           | 1/4"       | \$11.00 |
| #351     |                     | 3/16" Round Over   | 3/16" R                            | 7/8"       | 1/2"           | 1/4"       | \$11.00 |
| #230     |                     | 1/4" Round Over    | 1/4" R                             | 1"         | 1/2"           | 1/4"       | \$12.00 |
| #353     |                     | 5/16" Round Over   | 5/16" R                            | 1 1/8"     | 1/2"           | 1/4"       | \$14.00 |
| #209     |                     | 3/8" Round Over    | 3/8" R                             | 1 1/4"     | 5/8"           | 1/4"       | \$15.00 |
| #355     |                     | 1/2" Round Over    | 1/2" R                             | 1 1/2"     | 3/4"           | 1/4"       | \$17.00 |
| #655     |                     | 1/2" Round Over    | 1/2" R                             | 1 1/2"     | 3/4"           | 1/2"       | \$17.00 |
| #656     |                     | 3/4" Round Over    | 3/4" R                             | 2"         | 7/8"           | 1/2"       | \$21.00 |
| #199     |                     | Multiform Moulding | Unlimited Patterns                 | 2 1/4"     | 2"             | 1/2"       | \$40.00 |
| #205     |                     | 1/4" Cove          | 1/4" R                             | 1"         | 1/2"           | 1/4"       | \$12.00 |
| #206     |                     | 3/8" Cove          | 3/8" R                             | 1 1/4"     | 5/8"           | 1/4"       | \$13.00 |
| #207     |                     | 1/2" Cove          | 1/2" R                             | 1 1/2"     | 5/8"           | 1/4"       | \$14.00 |
| #643     |                     | 1/2" Cove          | 1/2" R                             | 1 1/2"     | 5/8"           | 1/2"       | \$15.00 |
| #208     |                     | 3/4" Cove          | 3/4" R                             | 1 7/8"     | 3/4"           | 1/2"       | \$26.00 |
| #231     |                     | 5/32" Roman Ogee   | 5/32" R                            | 1 1/4"     | 1 1/2"         | 1/4"       | \$16.00 |
| #232     |                     | 1/4" Roman Ogee    | 1/4" R                             | 1 1/2"     | 3/4"           | 1/4"       | \$17.00 |
| #506     |                     | 1/2" Pattern       | Flush Trim                         | 1/2"       | 1"             | 1/4"       | \$15.00 |
| #508     |                     | 3/4" Pattern       | Flush Trim                         | 3/4"       | 1"             | 1/4"       | \$17.00 |
| #366     |                     | 1/8" Slot Cutter   | 3/8" Deep                          | 1 1/4"     | 1/8"           | 1/4"       | \$14.00 |
| #368     |                     | 1/4" Slot Cutter   | 3/8" Deep                          | 1 1/4"     | 1/4"           | 1/4"       | \$14.00 |
| #204     |                     | 3/8" Rabbeting     | 3/8" Deep                          | 1 1/4"     | 1/2"           | 1/4"       | \$13.00 |
| #670     |                     | 3/8" Rabbeting     | 3/8" Deep                          | 1 1/4"     | 1/2"           | 1/2"       | \$14.00 |

| ITEM NO. | BEST CUT BEST PRICE | DESCRIPTION     | ANGLE/DEPTH/RADIUS CIRCLE DIAMETER | LARGE DIA. | CUTTING LENGTH | SHANK SIZE | PRICE   |
|----------|---------------------|-----------------|------------------------------------|------------|----------------|------------|---------|
| #211     |                     | 3/8" Core Box   | round nose                         | 3/8"       | 3/8"           | 1/4"       | \$10.00 |
| #212     |                     | 1/2" Core Box   | round nose                         | 1/2"       | 1 1/2"         | 1/4"       | \$13.00 |
| #418     |                     | 3/4" Core Box   | round nose                         | 3/4"       | 5/8"           | 1/4"       | \$15.00 |
| #213     |                     | 1" Core Box     | round nose                         | 1"         | 3/4"           | 1/2"       | \$17.00 |
| #548     |                     | Lockmitre       |                                    | 2"         | 7/8"           | 1/4"       | \$32.00 |
| #214     |                     | 1/4" Straight   | plunge cutting                     | 1/4"       | 3/4"           | 1/4"       | \$ 6.50 |
| #216     |                     | 3/8" Straight   | plunge cutting                     | 3/8"       | 1"             | 1/4"       | \$ 6.50 |
| #474     |                     | 1/2" Straight   | plunge cutting                     | 1/2"       | 1"             | 1/4"       | \$ 7.00 |
| #219     |                     | 3/4" Straight   | plunge cutting                     | 3/4"       | 1"             | 1/4"       | \$ 9.50 |
| #779     |                     | 3/4" Straight   | plunge cutting                     | 3/4"       | 1 1/2"         | 1/2"       | \$10.00 |
| #462     |                     | 1/2" Bull Nose  | 1/2" Dia. of Circle                |            | 3/4"           | 1/4"       | \$16.00 |
| #464     |                     | 3/4" Bull Nose  | 3/4" Dia. of Circle                |            | 1"             | 1/4"       | \$21.00 |
| #764     |                     | 3/4" Bull Nose  | 3/4" Dia. of Circle                |            | 1"             | 1/2"       | \$21.00 |
| #545     |                     | Tongue & Groove | Straight                           | 1 5/8"     | 1"             | 1/4"       | \$29.00 |
| #845     |                     | Tongue & Groove | Straight                           | 1 5/8"     | 1"             | 1/2"       | \$29.00 |
| #546     |                     | Tongue & Groove | Wedge                              | 1 9/16"    | 1"             | 1/4"       | \$29.00 |
| #846     |                     | Tongue & Groove | Wedge                              | 1 5/8"     | 1"             | 1/2"       | \$29.00 |
| #450     |                     | 1/8" Beading    | 1/8" R                             | 3/4"       | 3/8"           | 1/4"       | \$11.00 |
| #233     |                     | 1/4" Beading    | 1/4" R                             | 1"         | 1/2"           | 1/4"       | \$13.00 |
| #454     |                     | 3/8" Beading    | 3/8" R                             | 1 1/4"     | 5/8"           | 1/4"       | \$15.50 |
| #455     |                     | 1/2" Beading    | 1/2" R                             | 1 1/2"     | 3/4"           | 1/4"       | \$17.00 |
| #500     |                     | 3/8" Flush      | Trimming                           | 3/8"       | 1/2"           | 1/4"       | \$ 7.00 |
| #501     |                     | 3/8" Flush      | Trimming                           | 3/8"       | 1"             | 1/4"       | \$ 7.50 |
| #503     |                     | 1/2" Flush      | Trimming                           | 1/2"       | 1"             | 1/4"       | \$ 8.50 |
| #221     |                     | 1/2" Flush      | Trimming                           | 1/2"       | 1 9/16"        | 1/2"       | \$ 8.00 |
| #558     |                     | Thumbnail       |                                    | 1 9/16"    | 3/8"           | 1/4"       | \$18.50 |
| #858     |                     | Thumbnail       |                                    | 2 1/2"     | 3/4"           | 1/2"       | \$35.00 |
| #579     |                     | Molding Plane   |                                    | 1 1/8"     | 1 3/4"         | 1/4"       | \$31.95 |
| #879     |                     | Molding Plane   |                                    | 1 1/8"     | 1 3/4"         | 1/2"       | \$31.95 |

New 32-page catalogue featuring 100's of high-quality router bits, plus other professional woodworking products.



## CONTROL THE SPEED OF YOUR ROUTER

ROUT AT THE SPEED THAT GIVES THE BEST RESULTS  
WITH THE WOOD AND BIT YOU ARE USING!

### FEATURES:

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

**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.

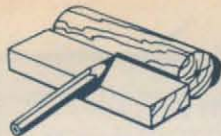
**SPECIAL SALE**  
**\$39.95 \$29.95**  
Order Item #197

Visit Our Fully Stocked Showroom  
(Call for easy directions - 8-30-5-00, M-F)

To order by Master Charge, Visa, or Discover Call Toll Free, 7 Day - 24 Hour Order Service,

**1-800-533-9298** or send check to: **MLCS Ltd., P.O. Box 4053JP, Rydal, PA 19046** ©1992





# Shop Tips

When making small boxes, many woodworkers find it's easiest to first assemble the box and then, using the table saw, cut off the lid by making four ripping cuts—one on each of the four sides. But, to do this safely, it's necessary to tape spacers in the saw kerfs when the fourth and final cut is made. Without the spacers, the separated lid is not supported, and it could contact the spinning saw blade.

To avoid the need for spacers, I make the ripping cuts with the saw blade set to a height that's  $\frac{1}{32}$  in. less than the thickness of the box sides. After making the ripping cuts on each side, I remove the box from the table saw and use a sharp utility knife to cut through the remaining  $\frac{1}{32}$  in. of stock, thereby separating the lid. A few passes with the block plane quickly cleans up the stock that remains.

*Dennis Preston, Brookfield, Conn.*

Lead shot, typically sold in 25 pound canvas bags at sporting goods stores, can often be used when you need to clamp chair legs or other irregular shapes. The canvas is loose enough to allow the shot



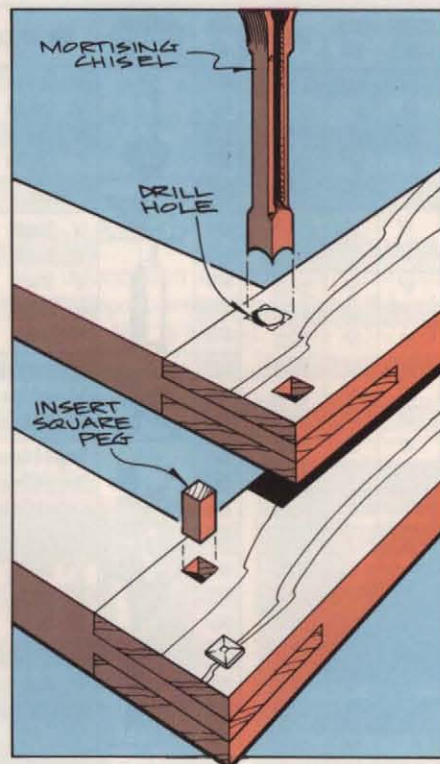
to conform to almost any profile. All common shot sizes (nos. 4, 6, 8, and 9) will work fine. Since the bag is generally made from lightweight canvas, it helps to reinforce it with duct tape.

*Dennis Preston, Brookfield, Conn.*

Square pegs can be an attractive decorative accent as well as a way to add mechanical strength to various common

joints such as the slip joint and the mortise and tenon. But making a square peg fit into a round hole requires a lot of hand whittling (you need to taper the peg from square on one end to round on the other), and chopping out a square mortise for the peg is almost as much work.

There is a better and faster way, and it makes use of a mortising chisel, the kind sold for use with a mortising attachment on the drill press. The  $\frac{1}{4}$  in. size is ideal, but other sizes are available. (You can

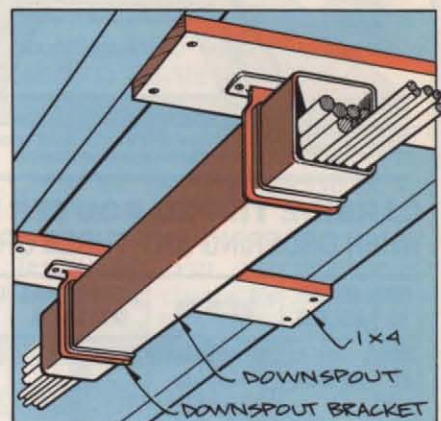


get a  $\frac{1}{4}$  in. mortising chisel for under \$15 from most mail-order catalogs.)

Use a drill bit that's the same size as the chisel to drill a hole to the desired depth. Next, center the chisel over the hole and use a few sharp blows from a hammer to drive the chisel to about the hole depth. Work the chisel back and forth a little to remove it. Any chips remaining in the square hole can be broken free with a nail or awl.

Rip the peg stock to the desired size, then cut to length. Now, add a bit of glue to the peg and drive it home with a mallet. The peg can be trimmed flush and sanded smooth or you can use a chisel to add a decorative chamfer to the protruding end.

I mounted a short length of plastic rain gutter downspout to my basement ceiling and found that it's a perfect spot to store dowel stock. First attach a



couple of 1 by 4's to span the floor joists, then use the plastic brackets to mount the downspout.

*Dennis Anliker, Spring Green, Wisc.*

Here's an old-time formula for a low-cost penetrating oil type of wood finish. Mix one-third boiled linseed oil, one-third turpentine and one-third dark vinegar. Start with one application per week for a month, then apply once a year after that.

Next time you're trying to remove a wood screw that refuses to budge, try holding the tip of a hot soldering iron against the screw head for a minute or so. The heat from the iron will expand the screw. After the heat is removed, the screw will quickly cool and shrink—and more often than not, it will come out with a minimum of effort.

*Howard E. Moody, Upper Jay, N.Y.*



**The Woodworker's Journal** pays \$25–\$100 for reader-submitted shop tips that are published. Send your ideas (including sketch if necessary) to: **The Woodworker's Journal P.O. Box 1629, New Milford, CT 06776, Attn: Shop Tip Editor.** We redraw all sketches, so they need only be clear and complete. If you would like the material returned, please include a self-addressed stamped envelope.



# Econ-Abrasives

WE MAKE ABRASIVE BELTS ANY SIZE, ANY GRIT!

## Standard Abrasive Sheets

### CABINET PAPER

|               | 50/pk   | 100/pk   |
|---------------|---------|----------|
| 60D           | \$15.00 | \$27.00C |
| 80D           | 14.00   | 25.00C   |
| 100 thru 150C | 13.00   | 23.00C   |

### FINISHING PAPER

|               |          |          |
|---------------|----------|----------|
| 80A           | \$ 10.00 | \$17.00C |
| 100 thru 280A | 9.00     | 15.00C   |

### WET/DRY PAPER

|                      |         |          |
|----------------------|---------|----------|
| 220 thru 600         | \$14.00 | \$24.00C |
| NO LOAD PAPER(white) |         |          |

|                  |         |          |
|------------------|---------|----------|
| 100 thru 400A    | \$11.00 | \$19.00C |
| *C* = 100 SHEETS |         |          |

### Velcro® Vacuum Discs

#### 8 Hole pattern for Bosch sanders

| Dia.            | Grit | Price    |
|-----------------|------|----------|
| 5"              | 60   | \$ .48ea |
| 5"              | 80   | .46      |
| 5" 100 thru 320 | .45  |          |



\*MINIMUM ORDER \$25.00  
 \*MasterCard, VISA, C.O.D. or Check  
 \*SATISFACTION GUARANTEED!!!  
 \*CALL FOR FREE 1992 CATALOG  
 - TX & NV add appropriate sales tax  
 - Continental U. S. shipping charges add \$5.50

## ABRASIVE BELTS

PLEASE SPECIFY GRITS

|          |           |          |           |
|----------|-----------|----------|-----------|
| 1X30     | \$ .73 ea | 3X24     | \$ .84 ea |
| 1X42     | .73 ea    | 3X27     | .87 ea    |
| 1X44     | .73 ea    | 4X21 3/4 | .96 ea    |
| 2 1/2X16 | .77 ea    | 4X24     | .99 ea    |
| 3X18     | .78 ea    | 4X36     | 1.20 ea   |
| 3X21     | .81 ea    | 6X48     | 3.14 ea   |
| 3X23 3/4 | .84 ea    | 2 1/4X80 | 2.94 ea   |

OTHER SIZES ON REQUEST

### JUMBO CLEANING STICK

ONLY \$8.80

2X2X12

### \* OTHER PRODUCTS \*

\*Wide Belts\*Rolls\*Flap Wheels  
 \*Pump Sleeves\*PSA Discs  
 \*Router Bits\*Wood Glue  
 \*Wood Bits\*Velcro® Discs  
 \*Wood Clamps\*Sanding Blocks  
 \*Drawer Slides\*Hinges\*TV Swivels

## Econ-Abrasives

P. O. Box J865021  
 Plano, TX 75086  
 (214)377-9779

# ROBLAND X 31

## THE INTELLIGENT ONE MAN SHOP

90-MINUTE  
DEMO  
VIDEO



- 1100 lbs.
- 3 separate 3HP motors
- 12" jointer
- 12" planer
- 10" table saw
- 50" sliding table
- 3HP shaper
- mortiser
- cast iron

### The Robland X 31

is designed to make maximum use of minimum space ideal for the small professional shop and the demanding hobbyist. Change from one tool to another in 20 seconds or less! Solid, sturdy, reliable.

CALL OR WRITE FOR MORE INFORMATION NOW!

2081 LAGUNA CANYON RD., LAGUNA BEACH, CA 92651

# LAGUNA TOOLS

1-800-234-1976 or 714-494-7006

## JOINT CONNECTOR BOLT W/13mm DECORATIVE HEAD

BRONZE PLATED • 4mm HEX DRIVE

| ITEM CODE | LENGTH IN MM | PKG. 10 | PKG. 50 | PKG. 100 |
|-----------|--------------|---------|---------|----------|
| JB01      | 30mm         | \$1.50  | \$ 5.50 | \$ 9.20  |
| JB02      | 40mm         | \$2.05  | \$ 7.65 | \$12.75  |
| JB03      | 50mm         | \$2.15  | \$ 8.05 | \$13.40  |
| JB04      | 60mm         | \$2.70  | \$10.10 | \$16.80  |
| JB05      | 70mm         | \$2.70  | \$10.10 | \$16.80  |

23 OTHER SIZES IN STOCK FOR IMMEDIATE SHIPMENT

## JOINT CONNECTOR SCREW W/13mm DECORATIVE HEAD

BRONZE PLATED • 4mm HEX DRIVE

| ITEM CODE | LENGTH IN MM | PKG. 10 | PKG. 50 | PKG. 100 |
|-----------|--------------|---------|---------|----------|
| JS01      | 7x30mm       | \$2.10  | \$ 7.85 | \$13.10  |
| JS02      | 7x40mm       | \$2.65  | \$ 9.90 | \$16.45  |
| JS03      | 7x50mm       | \$3.45  | \$12.90 | \$21.50  |

FREE 4MM DRIVE BIT INCLUDED • 12 SIZES IN STOCK

## CROSS DOWELS (BARREL UNITS)

STEEL DOWEL NUT FOR USE IN ALL MATERIALS

| ITEM CODE | THREAD SIZE | BARREL LENGTH | PKG. 10 | PKG. 100 |
|-----------|-------------|---------------|---------|----------|
| CD01      | 10-24       | 1/2"          | \$2.10  | \$13.35  |
| CD03      | 1/4-20      | 1/2"          | \$3.00  | \$18.60  |
| CD05      | 1/4-20      | 3/4"          | \$3.40  | \$21.40  |
| CD12      | 1/16-18     | 5/8"          | \$5.40  | \$33.80  |
| CD18      | 1/8-16      | 1"            | \$8.95  | \$56.00  |

18 SIZES IN STOCK FOR IMMEDIATE SHIPMENT

ORDERS MON-FRI 7AM-5PM

1-800-536-0009 • CATALOGUES 616-243-9412

## 4 PRONG T-NUTS

ZINC PLATED • FOR USE IN HARD AND SOFT WOODS

### STRAIGHT BARREL



27 SIZES IN STOCK FOR IMMEDIATE SHIPMENT

| ITEM CODE | THREAD SIZE | PRONG HEIGHT | PKG. 100 |
|-----------|-------------|--------------|----------|
| T401      | 10-24       | 5/16"        | \$3.77   |
| T402      | 1/4-20      | 5/16"        | \$3.91   |
| T403      | 1/4-20      | 9/16"        | \$4.75   |
| T404      | 1/4-20      | 7/16"        | \$4.87   |
| T405      | 1/16-18     | 3/8"         | \$5.95   |
| T406      | 1/8-16      | 7/16"        | \$9.82   |

## BRASS KNIFE THREAD INSERTS

MADE IN U.S.A. - LONG LEAD-EASY INSTRUCTIONS



38 OTHER SIZES AND MATERIALS WITH INSTALLATION TOOLS IN STOCK

| ITEM CODE | INSIDE THREAD | PKG. 25 | PKG. 100 | PKG. 500 |
|-----------|---------------|---------|----------|----------|
| BK03      | 8-32          | \$5.40  | \$16.15  | \$60.50  |
| BK04      | 10-24         | \$7.15  | \$24.20  | \$90.70  |
| BK06      | 1/4-20        | \$7.15  | \$24.20  | \$90.70  |
| BK08      | 1/16-18       | \$8.90  | \$33.20  | \$128.50 |
| BK10      | 3/8-16        | \$8.90  | \$33.20  | \$128.50 |

If order totals less than \$60 add 4.00 for S&H. If order totals over \$60, S&H is free only good in the continental U.S.  
 Michigan Residents add 4% Sales Tax

# BRUSS

BRUSS FASTENERS DIVISION OF ICC  
 P.O. BOX 88307, GRAND RAPIDS, MI 49518-0307



WHOLESALE DIRECT



## WELCOME

A boutique best seller! Not only does it say 'welcome', but it plays a Christmas melody with lights blinking in rhythm to the music.  
 #01570 Plans 4.00  
 #04570Z Plans and Parts Kit 12.00  
 #04570 Parts Only: 8.75/Ea, 23.85/3, 68.00/10



## PRANCER

When you push his tail he plays 'Rudolph' while his red light nose blinks in time with the music.

#01556N Plans 3.00  
 #04556NZ Plans and Parts Kit 7.25  
 #04556N Parts Only: 4.75/Ea, 12.90/3, 38.50/10



Parts Kits include all needed items to complete the project - EXCEPT LUMBER

|                                       |                     |
|---------------------------------------|---------------------|
| #18031 Lg. Candle Cup                 | 9.50/50, 17.00/100  |
| #18091 Brass Insert                   | 5.50/50, 9.00/100   |
| #16001 3-1/2" Shaker Peg              | 14.00/100           |
| #16021 2-1/2" Shaker Peg              | 7.50/50, 13.75/100  |
| #16041 1-3/4" Shaker Peg              | 7.50/100, 15.00/250 |
| #10648 1" Wheel, 1/4" hole            | 5.50/100            |
| #10710 1-1/4" Wheel, 1/4" hole        | 5.50/100            |
| #10812 1-1/2" Wheel, 1/4" hole        | 10.50/100           |
| #10914 1-3/4" Wheel, 1/4" hole        | 15.00/100           |
| #11016 2" Wheel, 1/4" hole            | 17.00/100           |
| #12001 7/32" Axle Peg (for 1/4" hole) | 3.10/100            |
| #62501 Door Harp Tuning Pins          | 17.00/100           |
| #13156 3/4" Drilled Clapper Balls     | 8.00/100            |
| #62515 Door Harp Wire, 1/4"           | 9.95/Spool          |

## CRAFTER'S MART

P.O. BOX 2342-J GREELEY, CO 80632  
 64-Page CATALOG: \$2 with credit towards first order, Free with any order. Check, MasterCard or VISA (include daytime phone, card no., exp. date & signature).  
 PROCESSING CHARGE: Continental U.S. \$4; AK, HI, APO & FPO \$10; Canada \$16; Foreign 20% plus \$10 (U.S. Funds). CO Res. add 3% tax. PHONE ORDERS: 8am-5pm Mon-Fri, Mtn. Time. Info: (303) 351-0876  
**1 - 800 - 999-3445, Ext. 44**



# Woodworker's HARDWARE

Manufacturer's Hardware For The Home Craftsman

## FREE CATALOG

Huge line of **SPECIALIZED** Cabinet and Furniture Hardware.

- Knobs
- Pulls
- Hinges
- Drawer Slides
- Lighting
- Cabinet Accessories
- Connectors
- Locks
- Abrasives
- Much, Much More!**

Send or call for **FREE CATALOG**  
P.O. Box 784 St. Cloud, MN 56302

**1-800-383-0130**

## MIRRORA - BEVELED CIRCLES

PERFECTLY BEVELED MIRROR

- 6 sizes of circles from 1½" to 6" and 63 other sizes, shapes and colors available • 1,000,000 pieces in stock—UPS Shipable—Ready-to-go
- Highest quality float glass—Double-backed for protection • We fabricate any shape or size of glass & mirror
- Call 1-800-MIRRORA Now to place orders and get our color catalog

**FLORAL**  
Glass & Mirror, Inc.

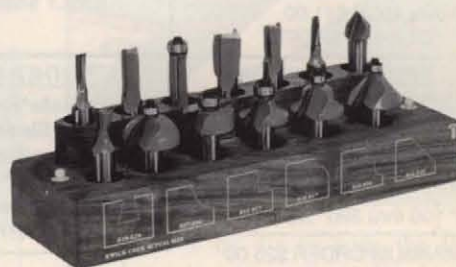
895 Motor Parkway  
Hauppauge, New York 11788  
516/234-2200 800-647-7672

# Product News

To keep our readers up-to-date, this column features brief descriptions of new tools and supplies on the market. The product descriptions are provided by the manufacturer and are not the result of tests or reviews by the editors of *The Woodworker's Journal*.

## CMT Router Bits

Is there such a thing as a better router bit? CMT Tools takes router bit technology a step ahead with this new router bit line. High quality Italian bits are price-competitive with Taiwanese bits and feature "Fatigue Proof 100 steel," (the same steel used by Ferrari in critical transmission parts). Bits have baked-on Teflon coating, feature micro-fine grain carbide, and where possible, utilize standard anti-kickback design for maximum safety. Contact CMT, 5425 Beaumont Center Boulevard, Suite 900, Tampa FL 33634; tel 1-800-531-5559.



## AngleWright

For precision woodworking, accurate table saw and radial-arm saw settings are a must. By positioning stock against the AngleWright, you can cut any angle to within 0.1 degree accuracy. Extruded aluminum construction and flanged sides insure AngleWright will yield solid support, and it can stand on edge to set compound miter angles. Cost is \$85.50 postpaid from AngleWright Tool Co., P.O. Box 25632, Los Angeles, CA 90025; tel. (310) 471-7432.



## ARE YOU READY FOR AN ADIRONDACK PICNIC?



ROCKER (ISSUE 15-3)



CLASSIC CHAIR (ISSUE 10-4)



SETTEE (ISSUE 13-2)

**Be ready for picnic time!  
Order all 3 and save!**

- ☐ Please send me all 3 issues for \$8.95  
☐ Please send me —issue(s) @ \$3.95 ea.  
(circle issue) 10-4 13-2 15-3

Outside US add \$3.00 P/H \$

Canadian orders add 7% GST \$

CT residents add 6% tax \$

TOTAL ENCLOSED (US FUNDS) \$

Name \_\_\_\_\_ Mail to: \_\_\_\_\_  
Street \_\_\_\_\_ The Woodworker's Journal  
City \_\_\_\_\_ P.O. Box 1629  
State \_\_\_\_\_ Zip \_\_\_\_\_ New Milford, CT 06776

**ALL 3  
PLANS  
FOR ONLY  
\$8.95!**

## The Art of Wood Marquetry

The burgeoning popularity of marquetry (a technique that uses veneers or inlays to create pictures) has led Condor Media and master marquetarians Lora Hunt and Spider Johnson to create *The Art of Wood Marquetry*, a video that teaches hobbyists, woodworkers and artists the skills needed to do marquetry themselves. The video centers on the modified American Patch-Pad technique, covering basics like filling, gluing, clamping, sanding and finishing, but also lists tools needed, and details how to achieve special effects like sand shading. One hour in length, the VHS tape costs \$63.95 postpaid. Contact Condor Media, P.O. Box 121699, Arlington, TX 76012; tel. (817) 261-3200.





### Synthetic Steel Wool

If you gave up using steel wool years ago because it clogs, rusts, and shreds—not to mention how rough it can be on hands—here's a product that has all the good, but none of the bad qualities of traditional steel wool. Synthetic Steel Wool from 3M is a combination of synthetic fibers and abrasive particles that functions like steel wool, yet is easy on the hands, won't rust, splinter or shred, resists clogging, and can even be rinsed and reused. Available in grits from coarse to extra fine, Synthetic Steel Wool pads outlast conventional steel wool and are compatible with stains and finishes. Available at hardware stores and home centers or write to: D-I-Yourself Consumer Relations, Do-It-Yourself Division, 515-3M-02, St. Paul, MN 55144.



### Woodcarver's Safety Glove

It's called the Woodcarver's Safety Glove, but this glove, made by Golden Needles Knitting Co. from a new patented combination of Kevlar, Spectra, and stainless steel, is useful for any application where you need some protection against a knife or cutting tool slip. Unsurpassed for cut resistance, durability and comfort, the glove fits equally well on either hand. Preferred by professional carvers, the glove is available (in extra small, small, medium or large sizes) from Woodcraft, 210 Wood County Industrial Park, P.O. Box 1686, Parkersburg, WV 26102; tel. 1-800-225-1153. Cost is \$22.50.



### SPECIAL OFFER

Distinguish Your Fine Workmanship With Your Own, Personal

## BRANDING IRON

For Hard and Soft Wood



**\$26<sup>00</sup>**

Plus 3.00 for shipping and handling  
Nebr. residents add correct sales tax

ORDER TOLL FREE  
**1-800-826-7606**



**SATISFACTION GUARANTEED**  
or your money back

For free brochure, write or call (402) 464-0511

- Shipped in one week
- Solid brass head — raised letters
- 1st Line: HAND CRAFTED BY — as above
- 2nd Line: Your choice — 20 characters/spaces max.
- Complete with handle
- As above but with 3rd line — \$37.00 + \$3.00

Order by mail from:

**NOVA TOOL CO.**

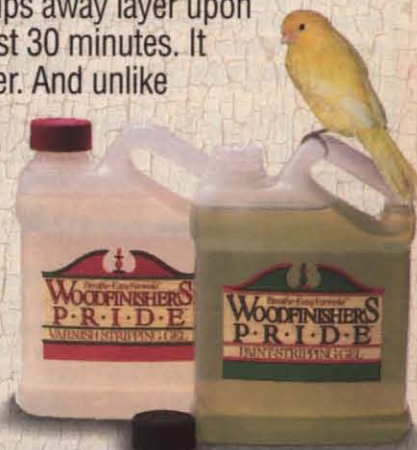
12500 Finigan Rd., Dept. WJ  
P.O. Box 29341, Lincoln, NE 68529

# WE'LL TAKE ON ANYONE ON THE STRIP

New Woodfinisher's Pride® Stripping Gels easily beat the leading strippers. In fact, people prefer us 2-to-1 over Formby's and Strypeeze.

Woodfinisher's Pride strips away layer upon layer of paint or varnish in just 30 minutes. It cleans up with soap and water. And unlike traditional strippers, it works its wonders with no flammable chemicals or obnoxious fumes. So it's safer for you and your environment.

Strip with speed. Strip with power...Strip with pride.  
New Woodfinisher's Pride®



**The Safer Stripper That Really Works.**

For the whole story, call 1-800-45-PRIDE.



# Reliant™ POWER TOOLS

Value Plus Performance  
At Discount Prices

## 1 HP Dust Collector

- Dual Voltage 110/220.
- 12.6 amps.
- Vacuums at 610 cubic feet/min. with single 4" intake.
- Two bags (separator and filtering).
- Great suction up to 25 feet.
- Quiet operation.
- Hoses not included.

NN720

Only \$229.95

Includes Shipping



1-YEAR LIMITED WARRANTY

1-800-767-9999

To order at this special price, mention Dept WJ72 to our operator.  
Fast FREE Shipping to 48 States MA, ME, RI Res. Add Sales Tax

Offer Expires 8/31/92

**Trend-lines®**

Dept. WJ72 • 375 Beacham St. • Chelsea MA 02150

For Free Catalog Call-1-800-366-6966



## Sheep Planter Plan

This sheep grazes wherever you need a colorful accent! Pattern is drawn FULL SIZE. Hardware parts available below.

#W885 Sheep Planter Plan.....\$6.99/EA

## Sheep Planter Hardware Parts

Includes planter box liner, eyes, sheep's wool, and bell. Not Included: plan, screws, wood, flowers or paint.

#3350 Sheep Planter Hdw. Parts.\$12.99/PKG

HOW TO ORDER: List quantity, part number, item, price & total of order. Include \$4.95 shipping & handling per order. MN residents add 6.5% sales tax. Mail check or money order. Credit card customers call TOLL FREE 1-800-441-9870.

MEISEL HARDWARE SPECIALTIES  
P.O. BOX 70JB MOUND, MN 55364



## Readers' Information Exchange

Looking for an owner's manual for an old band saw? Need a bearing for a hand-me-down table saw? Can't find a source of supply for an odd piece of hardware? Maybe our readers can help. Send along your request and we'll try to list it here—and perhaps one of our readers will have an answer for you. We'll include as many requests as space permits.

I have a wood planer with no motor. I need to know the hp rating and the speed at which the 12 in. blades should turn. The name plates read: Boke Crane; Skydyne, Inc., Port Jervis, NY; 118; Date 2-27-45; Ser 8017.

Robert J. Schiffel  
7 Struble Pl., Sussex, NJ 07461

I need information on where to buy tires for an older Sears 14 in. band saw, model no. 103.24230.

Leonard Barr  
Box 55, Lanark, ON, K0G 1K0 Canada

I need a bulb for my Stanley router, part no. H258A. Stanley no longer sells this tool and I can't find a bulb to fit.

William J. Alcorn  
2102 Albany, Hot Springs, SD 57747

I need a table and mounting hardware for a Ward's Powr-Kraft 10 in. band saw, model no. E26, factory no. 64FD2303.

Doug Child  
4850 S. Pacific Hwy.  
Phoenix, OR 97535

I'm looking for a copy of plans for an inverted pin router, originally sold by Woodkraft Mfg. of Ephrata, Wash.

Harry Graham  
3573 Kirkwood Road  
Columbus, OH 43227

I need a cutter head and knives and an infeed 1/2 x 20 leadscrew for an old Sears 4 1/4 in. jointer, model no. 103.0502, manufactured by Pollard.

Bert e. Williams  
49 Brambling La., Voorhees, NJ 08043

I need a manual and information on mounting the motor on a Sears 6 in. metal lathe, model 101.07301.

Glenn Patsch  
1144 Dorsh Rd., S. Euclid, OH 44121

I need the top sleeve/bearing for my Craftsman benchtop drill press, model no. 109.0301.

Ken Stremming  
12 Springlake Ave., Hinsdale, IL 60521

I have an 8 in. Tomlee Tool table saw and need table extensions and any information, parts sources, etc. for it.

Dana D. Timms  
1007 3rd Ave., Cando, ND 58324

I'm looking for a blade guard for an Oliver 6 in. joiner, no. 133, made 7-28-22. Any information would help.

Larry Brigman  
1501 London Cts., Naperville, IL 60563

I need a speed changer for an ER model Shopsmith.

James Martin  
710 Park Ave.  
Little Chute, WI 54140

## Owners Manuals and Parts Lists Needed

Sears radial-arm saw, model no. 103.29310 . . . . . Dan Drummel  
26721 Julia St., Wind Lake, WI 53185

Four Sears Craftsman tools: lathe, model no. 103.23071; planer, model no. 112.23490; table saw, model no. 113.27520; band saw, model no. 103.24280 . . .

Carl York, 830 Van Buren St., Herndon, VA 22070

Craftsman 10 in. table saw, model no. 113.22401 . . . . . Jerry E. Angus  
11 Byers Ave., Portsmouth, VA 23701

Sears 6 in. by 48 in. belt sander, model no. 103.0803 . . . . . Tom Taylor  
705 Concord Rd., Anderson, SC 29621

Craftsman table saw, model no. 113.29901 . . . . . Richard Hanes  
3465 N. Cnty Rd. 27, Loveland, CO 80538

Belsaw 12 in. planer/molder, model no. 9103 and info on infeed and outfeed roller adjustment . . . . . Keith Bundy  
13 Goetz Dr., Cold Spring, KY 41076

Sears 8 in. metal lathe, model no. 109.20630, chuck no. 383.22960 . . . Don Taylor  
2504 Carroll St., Monroe, NC 28110

Rockwell drill press, model 15 . . . . . Ron Briggs  
145 C. Philhower Rd., Lebanon, NJ 08833

Foley-Belsaw automatic saw filer, model no. 200 . . . . . Conrad M. Huard  
32520 Lakeshore Dr., Tavares, FL 32778



# The Cordless Tool Revolution

*Is it time to pull the plug and go cordless?*

*by Jim Barrett*

slew of cordless electric drills, screwdrivers, and variations thereof, you'll also find cordless jigsaws, portable circular saws, trim saws, laminate trimmers and caulking guns. The way things are going, we may even see cordless routers, belt sanders, biscuit joiners, and power miter saws within a few years.

### Better Batteries

The first cordless tool to use rechargeable nickel-cadmium (NiCd) batteries was a 4.8V drill introduced by Black & Decker way back in

tools could drill a few dozen small holes or drive a handful of small screws on one charge, then it was back to the charger for 6 to 12 hours. Targeted for the D-I-Y-er, they were okay for light, occasional work, but were hardly practical for professional use.

**More Juice, Detachable Packs:** As batteries became more efficient, voltages increased. Over the last decade, 7.2V and 9.6V tools were the standard. During this time, two things happened that made cordless drills and screwdrivers practical in professional and home shops and on job sites: the introduction of detachable battery packs, and the development of 1-hour "fast" chargers. The more powerful packs provided these tools with enough speed and torque to handle larger drilling and driving tasks, and enabled them to do a respectable amount of work on one charge. And, because the packs were detachable, the tool itself was no longer tied to the charger for hours at a time. You could simply buy a second battery pack, and rotate the two packs on the charger as you worked. This enabled you to use the tool more or less continuously, or at least long enough to complete a project with little or no downtime on the charger.

In the '90s, professional-duty cordless tools are coming of age. Battery voltages keep inching up, chargers are getting faster, and tool motors are becoming more and more efficient. The good news for woodworkers is that this explosive technology now makes a wider variety of cordless tools practical in the shop. In addition to a

1961. Other companies eventually followed suit with drills and screwdrivers. These early tools had integral batteries consisting of two to four 1.2V NiCd cells (2.4V to 4.8V). Because the cells were hard-wired into the tool, you couldn't replace them—when the battery would no longer hold a charge, you discarded the entire tool. These early



Then came the 12V and 13.2V drills and drill/drivers, which nearly rivaled the torque and speed of their corded counterparts.

Black & Decker probably has the gutsiest cordless drills and drivers yet—their 24V Thundervolt series. These industrial-type tools operate on 24-volt lead-acid battery packs. According to Black & Decker literature, they're every bit as powerful as professional-duty corded drills. However, the battery packs are too large to fit directly onto the tool, so they must be strapped to the user's waist, with a short umbilical cord



**Photo 1a:** Twist Xtra screwdriver is one of four consumer tools from Skil that will be available with detachable battery packs by this fall.



**Photo 1b:** Charger and battery for Skil Xtra.



**Photo 2a:** Faster Chargers; Left to right: Metabo 10-minute charger takes batteries from 4.8V to 12V; Bosch three-bay multi-volt charger will charge up to three batteries at once; Panasonic 15-minute charger takes 7.2V to 12V Panasonic batteries.

connecting the tool to the battery pack. Designed primarily for on-site construction work (to eliminate gas generators and long extension cords), I think they're a bit too much tool for most in-shop woodworking projects.

Aside from voltage increases via more cells, the NiCd cells themselves are becoming more efficient. For example, Panasonic has recently introduced their "Type E" battery packs, which they claim will do 40 percent more work than conventional NiCd packs of the same voltage. We'll probably see NiCd batteries becoming even more powerful, volt for volt, as time goes on.

**Longer Battery Life:** Today's NiCd batteries are also longer lived. Under normal use and proper recharging methods, the batteries used with most portable power tools can be recharged from 500 to 600 times (several manufacturers boast much higher figures). Also, the so called "memory" problem associated with the early NiCd batteries has been eliminated. That is, you don't have to fully drain and recharge the battery between uses to maintain a battery's maximum charging potential. And, several companies have introduced chargers that they claim will increase battery life by as much as three times.

**Non-polluting Batteries:** Most of the tool companies still offer the lower-voltage "integral battery" consumer tools with 3–6 hour chargers to suit the needs and budget of the occasional user. Even though they're clearly superior to their predecessors of just a decade ago, they'll soon be phased out in favor of tools with detachable packs or easily replaceable cells. The reason is not so much user convenience, but a response to environmental legislation relating to the disposal of NiCd and lead-acid batteries. New Jersey, Minnesota and Vermont have already passed laws that will require batteries in tools and appliances to be easily removable by the consumer. Also mandated are tool manufacturer spent-battery collection programs. In effect, the laws encourage the recycling of the nickel and cadmium plates in NiCd batteries, rather than allowing these heavy metals to contaminate landfills. At the time of this writing,



**Photo 2b:** Makita 15 minute charger accepts 7.2V and 9.6V Makita batteries.



**Photo 2c:** 10-minute charger from DeWalt accepts batteries from other tool manufacturers.



**Photo 3:** Cordless kit from Wen includes three 7.2V tools, charger, and accessories.

12 other states were considering similar legislation.

The two largest manufacturers of integral-battery consumer tools, Skil and Black & Decker, have taken the lead in this area. Skil has developed a line of consumer tools called the Flexi-charge Interchangeable Battery System, with



detachable battery packs to replace their integral-battery models. The first of these will include two cordless screwdrivers (including the Skil Twist Xtra and its changing system, shown in Photos 1a and 1b) and two cordless drills, which should be on the market this fall. According to company spokesman George Bizadellis, many more integral-battery tools will be converted to this system in the near future.

Black & Decker has initiated a program for recycling spent NiCd and lead-acid batteries of all types. You can

turn in "dead" integral-battery tools at any of 117 company-owned B & D service centers for disposal or battery replacement. B & D will replace the batteries for the cost of the new batteries only (no labor charge). B & D authorized centers will have the same program but will charge labor to install new batteries. By January 1993, all B & D integral-battery tools will be redesigned to have easily replaceable cells. Other companies will soon follow suit, either with low-end detachable-battery tools or with replaceable cells.

### Faster Chargers

While 1-hour "fast" chargers are still the industry standard, even faster chargers are available. Panasonic was first to introduce a 15-minute "coffee-break" charger. AEG and Metabo have 10-minute chargers; Black & Decker, DeWalt, Makita have 15-minute chargers, and Milwaukee a 1/2-hour charger. Bosch and Hitachi plan to introduce fast chargers in the near future. Bosch also offers a multi-bay 1-hour charger that will charge up to three batteries at once.

If you already own some cordless tools and want to buy the company's fast charger, check with them first to make sure the charger will work with the tool's battery. Some of the fast chargers won't work with older battery types. Modern chargers have thermal sensors that read the battery temperature and prevent them from recharging the battery if it is too hot. Several include a standby feature that automatically switches on the charger when the battery cools down to the correct temperature. This feature enables you to put a hot battery pack in the charger and forget about it. Some also have a diagnostic feature that indicates a defective battery or charger. Also, all modern chargers have some sort of automatic shutoff device to prevent overcharging.

### More Efficient Motors/Gearing

Advances in motor and gearing technology have also contributed to the increased power of cordless tools. Many professional-use tools, for instance, have a highly efficient planetary gear system to reduce frictional power loss in the



**Photo 4a:** Left to right: AEG ABSE 15 (12V, 1/2 in. drill/driver); Bosch 3051 VSR (9.6V 3/8 in. drill/driver); Black & Decker 2666 (13.2V 1/2 in. drill).



**Photo 4b:** Left to right: DeWalt DW945 (12V 3/8 in. drill/driver); Hitachi DS10DVA (12V 3/8 in. drill/driver); Metabo 0126 (12V 3/8 in. drill/driver).



**Photo 4c:** Left to right: Panasonic EY6205 (12V 3/8 in. drill/driver); Porter-Cable 853 (12V 3/8 in. drill/driver); Ryobi TFD-220VR 12V 3/8 in. drill/driver).

# 4<sup>th</sup> OF JULY SALE

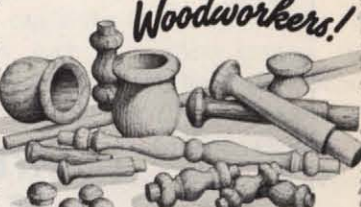
EXPIRES 8-15-92

## Toy Builders!



|                           | SALE                        |
|---------------------------|-----------------------------|
| 2" Spoke Wheel w/pegs     | \$10.00 / 12 \$ 8.50 / 12   |
| 1" Toy Wheels             | \$ 6.00 / 100 \$ 4.50 / 100 |
| 1-1/4" Toy Wheels         | \$ 8.00 / 100 \$ 6.50 / 100 |
| 1-1/2" Toy Wheels         | \$10.00 / 100 \$ 7.50 / 100 |
| 2" Toy Wheels             | \$18.00 / 100 \$15.50 / 100 |
| Axle peg for above wheels | \$ 5.00 / 100 \$ 3.00 / 100 |
| 2-3/8" Little Man         | \$ 1.60 / 7 \$ 1.25 / 7     |
| 1-5/8" Pickle Barrel      | \$ 3.00 / 12 \$ 2.50 / 12   |
| 1" Treaded Tire           | \$10.00 / 100 \$ 8.00 / 100 |
| 1-1/4" Treaded Tire       | \$12.00 / 100 \$10.00 / 100 |
| 2-3/4" Treaded Tire NEW   | \$15.00 / 24 \$ 9.80 / 24   |

## Woodworkers!



|                           |                             |
|---------------------------|-----------------------------|
| 1-3/8" Candle Cup         | \$18.00 / 100 \$15.00 / 100 |
| 1/4" x 36" Birch Dowel    | \$ 5.50 / 25 \$ 4.50 / 25   |
| 3/8" x 36" Birch Dowel    | \$ 8.75 / 25 \$ 7.00 / 25   |
| 1-3/4" Mini Peg           | \$ 7.50 / 100 \$ 6.00 / 100 |
| 3-1/2" Shaker Peg         | \$15.00 / 100 \$11.50 / 100 |
| 3/8" or 1/2" Birch Button | \$ 2.00 / 100 \$ 1.50 / 100 |
| 1-1/2" Birch Spindle      | \$10.00 / 100 \$ 8.00 / 100 |
| 5-3/4" Birch Spindle      | \$10.00 / 25 \$ 8.75 / 25   |
| 12" Ramin Spindle 1/2 OFF | \$20.00 / 40 \$10.00 / 40   |



|                             |                             |
|-----------------------------|-----------------------------|
| 3" Lazy Susans              | \$ 1.25 / 1 \$ .90 / 1      |
| 4" Lazy Susans              | \$ 1.50 / 1 \$ 1.20 / 1     |
| 1/2" Brass Cup Hooks        | \$ 4.50 / 100 \$ 3.50 / 100 |
| 3/4" Brass Cup Hooks        | \$ 5.00 / 100 \$ 4.00 / 100 |
| #17 Brass Screw Eye         | \$ 2.50 / 100 \$ 2.00 / 100 |
| 1" x 3/4" Brass Butt Hinge  | \$ 1.70 / 10 \$ 1.20 / 10   |
| 1-1/2" x 1-1/2" Brass Hinge | \$ 2.70 / 10 \$ 2.20 / 10   |
| #4 x 1/2" Screws for Hinge  | \$ 2.50 / 100 \$ 2.00 / 100 |
| #6 x 1-1/4" Wood Screw      | \$ 2.40 / 100 \$ 2.00 / 100 |
| 1-5/8" Sawtooth Hanger      | \$ 4.00 / 100 \$ 3.00 / 100 |
| 5/8" Picture Hanger         | \$ 2.00 / 100 \$ 1.50 / 100 |

## 1-800-722-0311

To receive sale prices use Sale #J42



**FREE**  
With Order

**ALL NEW**  
**WOOD PARTS**  
**CATALOG \$1.00**

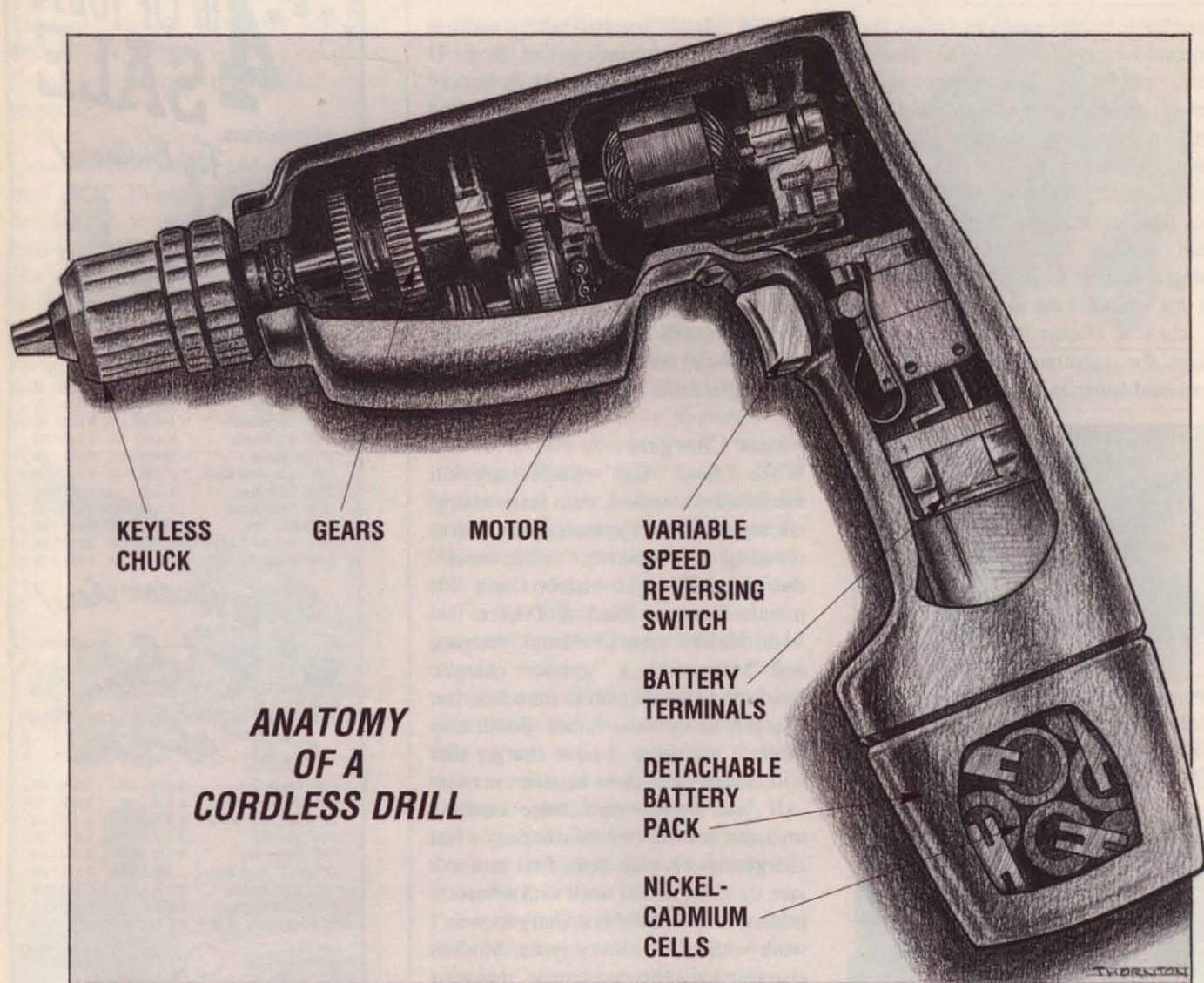
We accept M/C, VISA  
Check, or M.O. All orders  
add \$4.00 Handling  
TX add 7% tax. Canada add 30%  
Alaska, Hawaii add 15% for freight.



## Woodworks

P.O. Box 14507 Ft. Worth, TX 76117





tool's drive train. Black & Decker, DeWalt, Porter-Cable and Ryobi are using technologically advanced "rare earth" motors in some or all of their high-end tools. In these motors, the conventional ferrite magnets are replaced with neodiminum/iron/boron (NIB) magnets, which make them 20-30 percent more efficient than conventional motors in converting electrical energy into mechanical energy. The result is more power in a smaller package.

### Going With A System

Most tool companies now take a "system" approach with their cordless tools: That is, the same battery pack and/or charger will work with a group of different cordless tools in the company's line. For example, Makita offers 12

different 9.6V tools that use the same 9.6V battery and charger; their 7.2V battery/charger system works with 18 different Makita 7.2V tools. Their new 15-minute charger will charge batteries of both voltages. Wen takes a "kit" approach, offering three 7.2V cordless tools—a jigsaw, drill, and random-orbit sander—complete with charger and carrying case (Photo 3).

Many companies have universal-type chargers that accept batteries of several different voltages, so you needn't be locked into tools of all the same voltage in their line. The more voltages the charger accepts, the more versatile it is.

Until recently, you couldn't use one manufacturer's charger with another one's battery pack. Now Black & Decker and DeWalt have a universal

charger that accepts 2.4V to 13.2V batteries for their tools, as well as selected batteries from AEG, Bosch, Hitachi, Makita, Porter-Cable, Panasonic, and Ryobi. AEG's 1-hour, multi-volt UC charger will also charge certain batteries from Makita, Ryobi, and Panasonic. The advantage here, of course, is that the chargers enable you to switch brands *and* voltages within each brand without having to buy a separate charger for each. The chargers from Black and Decker and Dewalt will charge batteries for these two brands in 13 minutes; other brand batteries in about 18 minutes. According to company spokesmen, special voltage-sensing electronics in the charger extend battery life by as much as three times. Metabo makes similar claims for their



10-minute charger (according to Metabo, it increases battery life from 1,000 to 3,000 charges). As you can see, you have several options for creating a system to keep battery and charger costs down, and avoid cluttering up your bench with extra packs and chargers.

### How Much Power Do You Need?

While we can expect cordless tools to become even more powerful and compact, and battery recharge times even faster as time goes on, now may be as good a time as any to take advantage of existing cordless technology, rather than waiting for something better to come down the pike.

**How Big?** The amount of power you need depends largely on how you'll be using the tool. For example, you probably won't need a 12V or 13.2V "super-drill" or drill/driver unless you'll be drilling 1 in. or larger holes in hardwood or driving no. 12 screws or lag bolts into the same. In my experience, any of the modern 7.2V or 9.6V variable-speed drill/drivers are adequate for most furni-



**Photo 5:** Makita's 9.6V angle drill (Model DA390D) comes standard with a keyless chuck. The company also offers a keyed-chuck, 7.2 version.



**Photo 6:** Skil Super Twist (left) can be charged by sunlight; model shown will soon be available with a detachable battery; Panasonic EY503 (center) and AEG EZ-502 (right) stick drivers have six clutch settings, two-position handles, detachable battery packs. Right-angle extension shown on AEG is optional.



**Photo 7:** Cordless 9.6V 1/4-sheet palm sanders: Bosch model 1924 and Metabo model 0060. Both run 10-15 minutes per charge.



**Photo 8:** A recent introduction: 12V random orbit sander from AEG (model AVSR 500S).



**Photo 9:** Left: AEG 12V cordless jigsaw (model ASP 100) cuts at 1,900 strokes per minute (SPM). Right: Metabo 9.6V jigsaw (model EP 140) features variable speed control (700-2,500 SPM).

ture and cabinet assembly tasks. Most 7.2V drill/drivers, for example, will easily drive no. 6 x 1 in. screws into a cabinet carcass or drill holes up to 1/2 in. in diameter in most hardwoods or 5/8 in. holes in softwoods.

In their literature, manufacturers usually list the maximum size hole you can drill or fastener you can drive; some also list maximum torque figures (usually in inch-pounds). The torque figures help you compare the relative power output between different brand tools.

Remember, too, that an increase in voltage also means an increase in size and weight—the 12V drills and drivers can be pretty heavy and bulky. But they're nice when you need the extra

power for the occasional large hole or fastener.

**How Many?** In their literature, manufacturers often indicate how much work a drill or screwdriver can do by listing the number of holes they'll drill or screws they'll drive on one charge: for example, 350 3/8 in. holes in 1 in. lumber. As a rule of thumb, a 12V tool will do about twice as much work as a 7.2V tool on one charge. But this doesn't always translate into twice as many holes or screws, because the 12-volters are often geared for how big and how fast, rather than how many. That is, they deliver more up-front torque and speed, but use up relatively more juice to do it.

In the case of saws, some companies indicate how many lineal feet of wood you can cut per charge, e.g. 40 ft. of 1/2 in. thick wood, or how many crosscuts you can make in a 2 by 4. With other tools, such as cordless sanders, some companies indicate how many minutes the tool will run on a full charge. The various sanders shown in Photo 7 will run 10-15 minutes per charge, depend-



**Photo 10:** Two cordless tools for nuts and bolts woodworking jobs. Left: Sears Nutrunner accepts 1/4 in. drive sockets; right: SkilWrench accepts standard 3/8 in. drive sockets.



**Photo 11:** Makita Cordless Laminate Trimmer.



ing on the wood being sanded and the paper grit used.

Because battery and motor output is fairly standard among competitor's professional tools, the differences in the type and amount of work any tool will do is largely based on how the tool is geared. For example, one 12V drill may be geared to drill bigger holes or drive larger screws than a competitor's 12V drill, but it won't drill smaller holes as quickly (as torque increases, speed in rpm decreases, and vice-versa, given the same power input). Many top-end drills and drivers have two-speed gearboxes combined with variable-speed motors. In the "low" setting (e.g. 0-600 rpm) the tool provides higher torque for

(intermittent use vs. continuous use) and typical project requirements. Some cabinetmakers like to use two 7.2V drill/drivers, each with an extra battery pack. One is fitted with a screw pilot bit; the other with a screwdriver bit, to save time changing bits.

### **But Are They Really Practical?**

Most of the focus in cordless technology has been on drills, drill/drivers, and screwdrivers. One reason is that they (and their corded cousins) usually require less juice to do their intended job than other portable tools such as circular saws, belt sanders or routers. As a result, smaller battery packs can be used without adding undue weight or bulk to the

another cord—if you're willing to pay the extra price for this convenience.

Cordless jigsaws are a bit more practical, although they, too, are more expensive than corded ones.

While finishing sanders don't require a large amount of power to do their work, they're often run for longer periods of time than drills or power screwdrivers. For example, you may start and stop a drill numerous times during the course of an hour, putting perhaps 10 to 15 minutes actual "run-time" on it. With a sander, you usually keep the tool switched on until the job is done (stopping it only to change sandpaper), which could mean running it more-or-less continuously for up to 1/2 hour.



*Photo 12: Dremel now offers two cordless Moto-tools: model 850 (left) and model 750 (right).*



driving screws; in the "high" setting (0-1,200 rpm) it provides extra speed (at lower torque) for drilling holes quickly.

I use manufacturer's figures as a general guide only, because the actual work you get out of any cordless tool depends on how hard you bear down on it, the material you're working with, and the condition of the battery. For example, some companies claim that a drill will bore a certain number of 1/2 in. holes in "wood," but they don't specify if the wood they used was white pine or rock-hard maple. After testing a number of these tools, however, I've found that the figures are reasonably accurate if you don't overload or abuse the tool (i.e., bog down the motor), and the battery is relatively new. To figure out how much power you need, I'd suggest cutting the manufacturer's performance figures by about 20 percent, then comparing these figures to the battery recharge time, taking into account your work habits

tool. Another is design: the drill handle provides a convenient place to install the batteries without radically changing a drill's traditional shape or balance. For these reasons, tools in the cordless drill/screwdriver family have already found homes in many woodshops, eliminating a few extra cords to trip over or drag across the bench.

Because cordless circular saws and trim saws aren't yet as powerful as corded ones in the same price range, they haven't made significant inroads into the building trades, where such saws are often used day-in and day-out for extended periods of time. At the time of this writing, only Makita offered a cordless version of these tools. However, most in-shop woodworkers do much of their ripping and cutoff work on stationary saws, relegating the portable circular saw to an occasional-use tool for cutting unwieldy panels or boards down to size. A cordless one eliminates yet

Because cordless sanders run only 10-15 minutes per charge, you'd need a 15-minute charger or a multi-bay charger with several extra batteries if you wanted to use the sander continuously. Even so, I've found a cordless finishing sander convenient for many jobs, mainly because I prefer to sand my projects outdoors rather than in the confines of my small shop, and don't like untangling long extension cords.

### **Cordless Tool Sampler**

Because the major tool manufacturers offer at least a hundred or so different cordless tools between them, I've selected just a sampling of what's available. Some represent the latest in cordless technology; others are "specialty" tools that may be of interest to woodworkers.

### **Drills and Drill/Drivers**

Cordless drills and drill/drivers have practically all the features found on their



corded counterparts (except a cord on which to tie the chuck key). Models are available with one- or two-stage variable speed, keyless chucks, electric brakes, and depth-sensitive screwdriver heads. And, of course, any accessory you can chuck into a conventional drill will also fit a cordless one. AEG, Black & Decker, and Porter-Cable now offer cordless drills with 1/2 in. chucks. Cordless drywall guns, hammer-drills and rotary hammers are also available. Like their corded counterparts, cordless drill/drivers have adjustable clutches with five or more settings. Makita even has 7.2V and 9.6V versions of their popular 3/8 in. angle drill—good for close-quarter drilling and driving (Photo 5).

### Power Screwdrivers

All the major companies offer these, ranging from 2.4V consumer models to heavy-duty 9.6V tools. Many are simply lower-g geared versions of gun-type cordless drills, equipped with a special collet for hex-shaft screwdriver bits. Some models come with adjustable-torque clutches and depth-sensitive nosepieces (to drive screws to a precise depth).

Most tool companies also have compact in-line, or "stick" screwdrivers, which are great for accessing tight spots. The 2.4V AEG and Panasonic stick drivers shown in Photo 6 have 6-position adjustable clutches, 2-position swing-down handles and detachable battery packs. The Skil Super Twist shown features a bit storage compartment in the handle and an optional solar charger that recharges a fully discharged battery when exposed to 10 hours of full sunlight.

### Sanders

Bosch and Metabo have had their 9.6V cordless 1/4-sheet palm sanders on the market for several years now. Makita and Ryobi have 7.2V 1/3 sheet finishing sanders. New in the AEG lineup is a 12V cordless 5 in. random-orbit sander. AEG also offers a 12V cordless 4 1/2 in. disk sander that uses the same basic tool body as their random-orbit sander. As mentioned, all these sanders are good for 10–15 minutes continuous use on one charge (Photos 7 and 8).

### Saws

AEG, Makita, Metabo, Ryobi and Wen

all have cordless jigsaws. Makita also offers a 9.6V, 3 3/8 in. trim saw and a 10.8V, 6 1/4 in. circular saw. Panasonic plans on introducing a 12V trim saw this year (Photo 9).

### Other Handy Tools

The 1/4 in. drive Sears nutrunner and 3/8 in. drive SkilWrench (Photo 10) come in handy for many nuts-and-bolts jobs around the home and shop. The 3.6V SkilWrench shown fits all standard 3/8 in. drive sockets. Both tools can also be ratcheted manually. The Skil comes with a 3-hour charging stand, seven sockets, and a 3 in. socket extension. As with the Skil Super Twist, an optional solar charger is available. The Sears comes with a wall-mounted stand, five sockets and extension.

While nobody has a cordless router yet, Makita does have a 7.2V cordless laminate trimmer, which can also be used for edge and veneer trimming (Photo 11). And, for you power carvers and hobbyists in the crowd, Dremel offers two cordless versions of their venerable MotoTool, models 750 and 850, respectively (Photo 12).

## SOURCES

*The following companies manufacture cordless tools. Call or write for the name of a mail-order source or local distributor.*

### AEG Power Tool Corp.

Three Shaw's Cove  
New London, CT 06320  
1-800-243-0870

### Black & Decker

U.S. Power Tools Group  
10 North Park Drive  
Hunt Valley, MD 21030-0748  
(301) 527-7000

### Robert Bosch Power Tool Corp.

3701 Neuse Blvd.  
New Bern, NC 28560-9399  
1-800-334-4151

### DeWalt Industrial Tool Co.

626 Hanover Pike  
Hampstead, MD 21074  
1-800-433-9258

### Dremel

4915 21st St.  
Racine, WI 53406  
(414) 554-1390

### Hitachi Power Tools, U.S.A.

4487-E Park Drive  
Norcross, GA 30093  
(404) 925-1774

### Makita U.S.A., Inc.

14930-C Northam St.  
La Mirada, CA 90638-5753  
(714) 522-8088

### Metabo Corp.

1231 Wilson Drive  
West Chester, PA 19380  
(215) 436-5900

### Milwaukee Electric Tools

13135 Lisbon Rd.  
Brookfield, WI 53005  
(414) 781-3600

### Panasonic

Two Panasonic Way  
Secaucus, NJ 07094  
(201) 348-5334

### Porter Cable

P.O. Box 2468  
Jackson, TN 38302-2468  
1-800-321-9443

### Ryobi America Corp.

1424 Pearman Dairy Rd.  
Anderson, SC 29625  
1-800-323-4615

### Sears & Roebuck Co.

Sears Tower  
Chicago, IL 60684  
(312) 875-8862

### Wen Products

5810 Northwest Highway  
Chicago, IL 60631  
1-800-462-3630





# Finishing

## Finishes for Maple

*This favorite of woodworkers can be a challenge to finish*

by Jim Barrett

**M**ost non-woodworkers immediately associate maple with American Colonial furniture and kitchen items such as butcher blocks, cutting boards, and salad bowls. Of course, we as woodworkers find many more uses for this attractive hardwood. I'm particularly partial to highly figured maple—curly, tiger, and bird's-eye, especially when used in combination with darker hardwoods such as cherry or walnut.

Because maple is a dense, close-grain wood it accepts clear finishes well. It doesn't suck up finish like softwoods do, so fewer topcoats are required. Also, maple has no open pores that need filling, as oak and mahogany do. Practically any solvent-based topcoat—shellac, lacquer, oil varnishes and polyurethane—can be used with good results. Maple also responds well to water-based clear finishes, although many of these tend to raise the grain, as they will on most woods. Usually, several light coats of finish with a light sanding between each takes care of this.

Most solvent-based clear finishes (oil varnishes, polyurethane, lacquer) impart a warm amber cast to the wood, which darkens with age. Water-based clear finishes dry crystal clear, more closely resembling the color of maple "in the raw."

The only problem I ever ran into when applying a clear finish to maple was when I laminated it with alternating strips of padauk and applied a brushing lacquer. Padauk is a "bleeding" species, so when I brushed on the lacquer, it dissolved the natural pigments in the padauk, staining the adjacent maple a lovely shade of pink!

In short, maple has no special characteristics that require any particular attention when applying a clear topcoat—just follow

label directions on the finish you're using. But staining maple is a different story. Because ordinary, nonfigured maple often has contrasting light and dark areas within the same piece, many furnituremakers use a light maple stain to provide a more uniform coloration. But maple has the nasty tendency of absorbing stains unevenly, leaving a splotchy appearance. So, stains and staining techniques will be the first topic I'll cover.

The second topic relates to maple's role in the kitchen. If you're now using mineral oil (or worse, vegetable oil) to finish or condition butcher block tops, cutting boards, salad bowls and the like, there are better options, which I'll cover in detail.

### Stains

Because maple has a wavy grain (rather than a straight grain pattern like most other hardwoods), even relatively nonfigured boards will include spots where the ends of the wood fibers (or end grain, as it were) is exposed when milled. These areas wick up stain, while the areas where the grain runs parallel to the surface repel it. You'll find this effect most noticeable on curly or tiger maple, which is what produces its characteristic cross-grain striping. And, while you can use stains effectively to accentuate this striping, the effect on nonfigured maple is usually a random pattern of unsightly dark splotches.

I wanted to see if I could achieve an even, uniform color with a maple stain, while allowing most of the natural grain pattern and some of the original color to show through. The first step was to apply a stain controller to seal off the absorbent areas in the wood so the stain would absorb evenly. I used McCloskey's Stain Controller and Wood Sealer, which is suitable for use under oil- and water-based stains, and aniline dyes. The



manufacturer recommends that you don't use the sealer under lacquer or shellac. If you're adding a toner or shading stain to lacquer for spray application (an excellent way to achieve even coloration without obscuring the identity of the wood beneath) you can apply a sealer coat of seven parts denatured alcohol to one part 4 lb. cut white shellac. This recipe also works to control the penetration of oil-based stains, so you needn't buy a commercial stain controller if these materials are on hand.

The next step was to select a stain. I wanted a transparent stain that would provide good clarity to accentuate the grain, yet one that would give me precise color control during application. And, while I wanted the maple to look like maple, the color was of secondary importance in these tests. The "correct" color of maple or even Colonial maple is purely subjective—your idea and mine probably differ. Also, there's a certain color variance in the maple stains offered by the different manufacturers. You'll just have to try several brands, then go with the color that pleases you.

### Aniline Dyes

While aniline dyes offer excellent clarity, it's hard to control their penetration: once you apply the dye, the effects are immediate and practically irreversible. Even so, you can't beat aniline dyes for really popping out the grain in highly figured maple. A similar product, Behlen's Water Base Stain, gives you the same effect as an aniline dye. Classified as a metallic dye, it's more colorfast (UV resistant) than anilines. Because it's a water soluble dye, it may raise the wood grain. The photo shows Behlen's Yellow Maple water stain on a piece of figured maple. Straight from the bottle, the stain dyes the wood a bit dark, as shown, but you can dilute with water to achieve a lighter shade. While the color in the photo may or may not be to your taste, dye or stain colors can be mixed to produce any shade you want, provided they have the same base (water, alcohol, or non-grain-raising stains). Because of the wide variety of brilliant colors you can make, aniline dyes and Behlen's water-base stains are worth experimenting with when you want to create special effects. (For more on aniline dyes, see the November/December 1989 issue.)

### Gel Stains

Experience told me that gel stains would offer the greatest control during application. These stains don't penetrate as quickly as other oil- or water-based stains, giving you time to "move the color around on the wood" as you see fit. (For more on gel stains, see the finishing column in the July/August 1991 issue.) Also, if you apply the stain sparingly and wipe it off immediately, you can add just a hint of color without completely obscuring the natural color and grain pattern of the wood. To even out color variations, apply one or more coats to the lighter areas, blending them into the darker ones. The two gelled products I tried were Behlen's Master Gel Stain (Classic Colonial) and Formby's Wiping Stain (maple). The Behlen's stain can be topcoated after four hours dry time; the Formby's stain requires a 24-hour dry time. Gel-stain manufacturers

claim that because these stains offer precise color control, you don't need to use sealers or stain controllers. While this may be true with many woods, not so with maple. In the photo shown, the left side of the figured maple board at top was left bare; the right side pretreated with McCloskey's Stain Controller. I then applied a light coat of the Behlen's gel stain to both sides. The stain penetrated the "stripes" of the untreated side; the treated side has a more even coloration. Tests with the Formby's stain produced similar results.

### Wiping Stains

Generally, these stains aren't quite as thick as gel stains, but can still be applied with a cloth, rather than a brush, giving you a certain measure of control in application. (The terms gel stain and wiping stain are sometimes interchangeable, as in the case of Formby's Wiping Stain, which comes in gel form.) Behlen's 15-minute Wood Stain (maple), is a liquid oil-based wiping



*Aniline dyes and water-based stains provide excellent clarity, accentuating the grain of highly figured woods.*



*Before staining, the left side of this board was left bare; the right side was pretreated with McCloskey's Stain Controller to provide more even penetration.*





*Bemis Wood Conditioner and Jasco Butcher block oil are mineral oil finishes; Preserve is a nut oil product.*

stain that provides good color control and excellent clarity. According to the label, it does not raise the wood grain. The reason it's called 15-minute stain is because you can spray on a topcoat after 15 minutes dry time. If you apply a topcoat by brush, you'll need to let the stain dry 24 hours. Rather than allowing the stain to penetrate per the manufacturer's instructions, wipe it off immediately after application. If the color is too light, apply a second coat, allowing a slightly longer penetration time; then a third coat, if necessary, until you reach the color intensity you want.

While you can use any clear finish (lacquer, varnish, polyurethane) over any of these products, it's best to use a topcoat recommended by the stain manufacturer, to be assured of product compatibility.

### **Butcher Block Finishes**

Maple is usually the wood of choice for kitchen items because the wood itself provides a greater degree of resistance to cuts and abrasion than other species, and is less prone to absorbing food juices which can harbor bacteria. It's also a winner for kids' toys because it's extremely hard to chew and less prone to splintering than most other hardwoods.

Traditionally, maple cutting boards and other maple kitchen items are periodically "treated" with a nontoxic oil to further protect them against penetration of moisture and food juices, and to keep them looking good. Moisture—repeated wetting and drying—will warp the wood and eventually break the glue joints in laminated butcher blocks and cutting boards. Food

juices can penetrate the wood, harboring mold and bacteria.

Surface finishes (or applied finishes) are unsuitable because repeated cutting and abrasion soon mars the finish, not only making it look terrible, but also causing minute bits and pieces of finish to contaminate food. Penetrating oils, such as Danish oil, should be avoided because they contain toxic substances, even when dry, which can be transferred to food.

### **Mineral Oil**

This is by far the most popular treatment, because it is completely nontoxic, odorless, and tasteless. It doesn't turn rancid as vegetable oils do, and is nonsupportive of bacteria and mold. But, because mineral oil is a non-drying oil, it leaves a slightly oily film on the wood surface. Also, it is easily washed out of the wood each time you clean the item, so it requires frequent reapplication to be effective. (Ideally, you should give the item a light coating of oil after each cleaning).

If you do use mineral oil, make sure it is 100 percent food-grade mineral oil, the type sold at pharmacies for internal use (typically as a laxative). Food-grade mineral oil is also sold through gourmet kitchen supply stores as "butcher block oil" or "wood conditioner," under various brands; two of these are shown in the photo. By any other name, it's still the same stuff you can buy at the local drugstore. Ounce for ounce, the cost is about the same, no matter how it's labeled.

### **Nut Oils**

Peanut oil and walnut oil are derived from the meats of edible nuts, so they're not only nontoxic, but pleasant tasting, as well. Many gourmet cooks treat their cutting boards and other wooden utensils with peanut oil because it's readily available in most supermarkets. Pure walnut oil is generally available at health food stores. These and many other nut oils have a major advantage over mineral oil—they eventually dry and harden by a process called "polymerization," much like tung oil does. Nut oils provide a greater degree of protection against moisture penetration than mineral oil does, and with enough applications, they will completely penetrate the wood and eventually build up a "hand-rubbed" surface sheen like a Danish oil. Nut oils won't turn rancid like vegetable oils, and don't require as frequent application as mineral oil.

I had especially good results with a nut-oil product called Preserve, available from Woodcraft and several other mail-order woodworking catalogs (see Source List for address). According to the label, Preserve is "a rare blend of oils from the meats of exotic nuts." The manufacturer wouldn't tell me



what kinds of nut oils are used in the formula (proprietary information), but that they were chosen for their ability to polymerize, or harden, quickly. The walnut pictured on the bottle gives a clue to at least one of the oils used. Preserve has a faint nutty odor (and taste) when wet, but is odorless when dry. As with mineral oil, you can use the treated item immediately after application.

### Behlen's Salad Bowl Finish

This is a penetrating-type finish that works in much the same way as other solvent-based finishes—it dries by oxidation, rather than polymerization. That is, the solids which comprise the finish (when dry) are suspended in solvents (mineral spirits) and driers; when these evaporate, the dried solids are left in the wood. The difference between Behlen's Salad Bowl Finish and other solvent-based penetrating finishes is that it's completely nontoxic when dry, and meets FDA regulations for use on food-contact surfaces. The mineral-spirit solvents are toxic, however, so you need to wait at least 72 hours for them to completely evaporate before you can use the finished item for food preparation. (You must also take the same safety precautions during application as you do with other solvent-based finishes).



*Behlen's Salad Bowl Finish builds up to a glossy sheen; four coats were applied to this bowl.*

Behlen's acts more like a permanent finish, rather than a periodic treatment like nut oils or mineral oil. With enough coats you can actually build up a nice, glossy sheen, much as you can with tung oil. Behlen's Salad Bowl Finish has always been my old standby for wood salad bowls and utensils that I want to show off to company; also for kid's toys. The maple salad bowl pictured above is one that I found at a local thrift shop, in desperate need of help. After patient sanding and four coats of Salad Bowl Finish, it now looks better than new. For more utilitarian items, such as cutting boards, chopping blocks, kitchen knife handles, mixing spoons and meat tenderizing mallets, I think I'd opt for the convenience of a nut oil.

### Final Words

No finish will stand up to the abuse of a dishwasher, nor prolonged and repeated soakings in the sink. All wooden

utensils should be washed lightly under the faucet with mild soap, and dried immediately. When the surface appears dried out, reapply oil or finish.

If you're finishing a butcher block countertop or tabletop, none of the butcher block finishes mentioned provide nearly as much resistance to water, food acids and household chemicals as an oil varnish or polyurethane will, nor do they provide as many options in the finished appearance. If you want to finish a butcher block kitchen countertop that doubles as a cutting board or chopping block, you can rout a trough or groove around the "cutting board" portion of the top and apply mineral oil or nut oil within the perimeter, then finish the rest of the countertop with a stain and/or clear finish of your choice. I'd suggest using a marine-grade polyurethane if the countertop surrounds the kitchen sink.



## Sources

### Behlen

Rt. 30N Amsterdam  
New York, NY 12010  
Tel. (518) 843-1380  
*Salad Bowl Finish, Master Gel Stain,  
15 Minute Wood Stain, Water Base Stain,  
Solar-Lux NGR Stain (aniline dye)*

### Bemis Manufacturing Co.

300 Mill St.  
Sheboygan Falls, WI 53085  
Tel. (414) 467-4621  
*Bemis Wood Conditioner (mineral oil)*

### Jasco Chemical Corp.

P.O. Drawer J  
Mountain View, CA 94042;  
Tel. (415) 968-6005  
*Jasco Butcher Block Oil (mineral oil)*

### The McCloskey Corp.

7600 State Road  
Philadelphia, PA 19136  
Tel. (215) 624-4400  
*McCloskey Stain Controller and  
Wood Sealer*

### Thompson & Formby

825 Crossover Lane  
Memphis, TN 38117  
Tel. 1-800-443-WOOD  
*Formby's Hand Rubbed Wiping Stain*

### Woodcraft

210 Wood County Industrial Park  
P.O. Box 1686  
Parkersburg, WV 26102-1686  
Tel. 1-800-225-1153  
*Preserve nut oil finish*





## Joining Tops to Tables and Case Pieces

**Fastening solutions that allow for wood movement**  
by Roger Holmes

A few months ago, a friend with Chippendale taste and a K-Mart wallet asked me to look at a French provincial dining room table he'd fallen for at a local antique shop. It was a handsome piece. About 10 ft. long, over 3 ft. wide, its appealingly beaten up cherry top glowed warmly above stout, turned legs and sturdy apron rails. Trying our best to look like the kind of folks used to writing \$8,000 checks on the spur of the moment, we poked and peered and discreetly stretched a tape measure.

Safely out of the shop and cheered by my assurances that I could build him something similar for considerably less money, my friend began to enthuse. "I love the top," he said, "the dings and scuffs, the way it has split apart a little bit at each end—so much character. Could you make mine look that way?" Wincing a bit, I suggested that the dings and scuffs he inflicted in daily use might produce a patina more satisfying to him than anything I could do with chains and mallets. The splits, however, would be no problem—nature would do that.

He looked puzzled. Wood, I explained, is like a sponge—when the humidity rises, it soaks up moisture, swelling in the process; placed in dry conditions, it loses moisture to the air and shrinks. Sneaking a look under the table, I had noticed that the original builders fixed the tabletop immovably to the apron rails. Struggling in vain to expand and contract with seasonal

changes in humidity, the top eventually resolved the stresses by splitting at its weakest points. "Fixed in the same way," I promised, "your tabletop will share the same fate."

### Wood moves, don't ignore it

Rare is the client who will be delighted if the tabletop I make splits in a year or two. Most would be horrified, and rightly so. What passes for character in a 100 year-old rustic tabletop is, in new work, glaring evidence of carelessness.

It's not difficult to attach solid-wood tops to tables or case pieces so they can expand and contract without self-destructing. (Tops made of plywood, fiberboard and other man-made materials don't expand and contract.) The methods we'll look at are straightforward. The simplest take a few minutes; others require more time and effort, but none will tax your skills. But first, let's take a little closer look at wood movement.

Wood expands and contracts primarily at right angles to the length of its fibers; that is, perpendicular to the grain. This movement is relatively slow—the width of a top doesn't measurably shrink or expand before our eyes—but its extent can be surprising. The 42 in. wide cherry top on my friend's table, for example, might shrink 1/2 in. or more across its width with the change from moist summer to dry winter conditions.

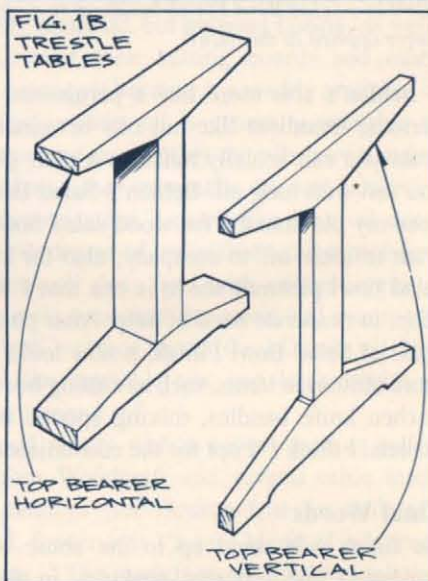
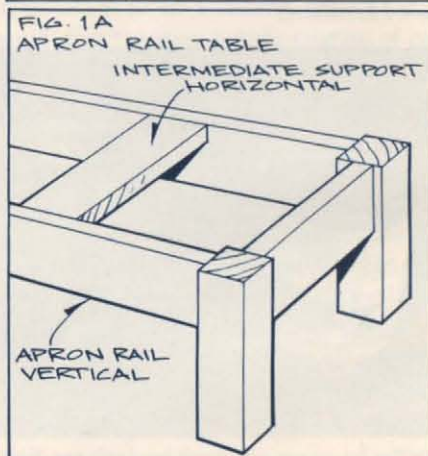
Different species of wood expand and contract at different rates, and there are

formulas to compute the precise amount of change in a given species as it gains or loses moisture. Bruce Hoadley's book, *Understanding Wood* (Taunton Press), furnishes the formulas, examples and an excellent discussion of the subject. Such precision can be useful if you're unfamiliar with the wood, but I usually base my tabletop fastening methods on a generous seat-of-the-pants estimate.

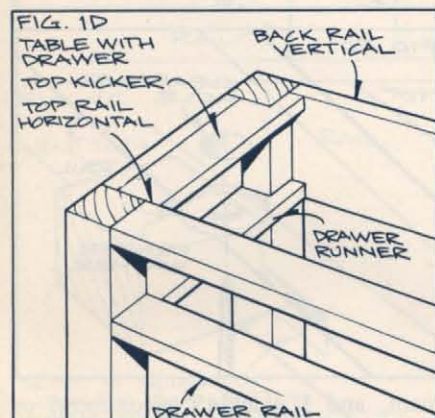
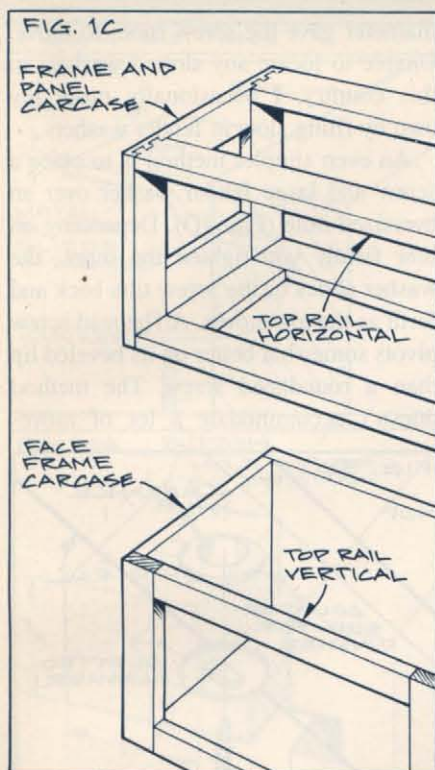
### Construction

Boiled to the basics, tabletops are almost always attached to one of just two kinds of bearers or rails—those placed horizontally, with a wide face up, and those placed vertically, edge up. Fig. 1 shows common types of furniture with applied tops.

FIGS. 1 COMMON FURNITURE TYPES WITH APPLIED TOPS



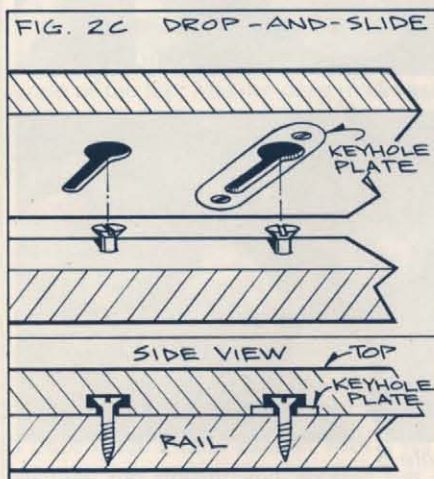
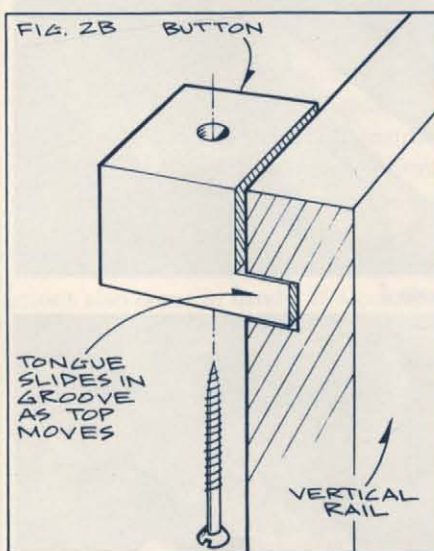
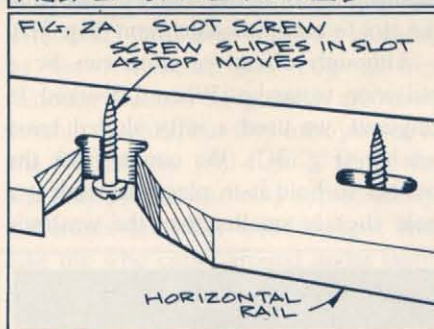




(Fig. 1A). Top bearers on trestle tables are just as often horizontal as vertical (Fig. 1B). Top rails on traditional carcasses are usually horizontal, while those on face-frame carcasses are vertical (Fig. 1C). Other constructions, such as a table with a drawer (Fig. 1D), may have a combination of vertical and horizontal members to which a top may be mounted.

Methods of fixing tops to these pieces are usually simple. It's easiest to screw through a horizontal rail to attach a top. But unless the rails are narrow or you want to mess with very long screws, it's a pain to screw up through vertical rails. Instead, tops are best fixed to vertical rails with "buttons," small pieces of

## FIGS. 2 BASIC FIXINGS



wood or metal attached to both the rail and the top. Occasionally, another method comes in handy. I call it "drop-and-slide," where a screw fixed to the top of the rail engages a keyhole shaped opening in the bottom of the tabletop; the keyhole can be cut in a metal plate or worked in the wood itself.

All of these methods can allow the top to move. In horizontal rails, screws slide in slots (Fig. 2A) oriented at right angles

to the grain direction of the top. In vertical rails, the tongues of wooden or metal buttons slide in routed grooves (Fig. 2B). In drop-and-slide fixings, the screw heads move along the narrow neck of the keyhole as the top expands and contracts (Fig. 2C).

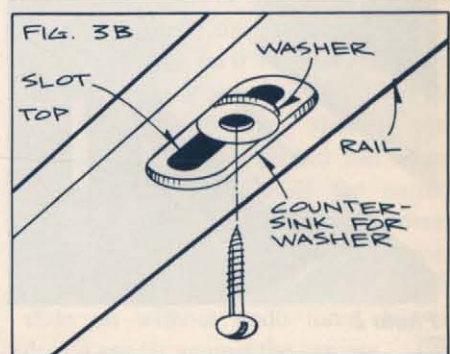
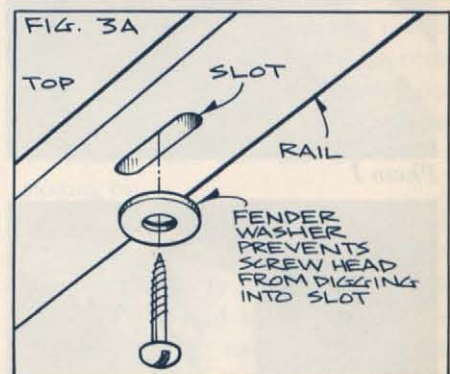
Not all points of attachment need be movable, however. I usually make the middle fixing on a trestle or apron rail immovable, so shrinkage will be more or less equal either side of it. Likewise, I often fix a carcass top immovably to the front rail where a flush fit or an unchanging overhang is important, letting the slot screws or buttons elsewhere accommodate the top's movement.

## Slot Screws

The simplest form of slot is a single, narrow channel, just fractionally wider than the diameter of the screw's shank, as shown in Fig. 2A. A plunge router makes short work of cutting these (remember to make several passes of increasing depth to avoid burning out the bit), but you can do the job by boring a series of holes and clearing the waste with a thin chisel.

In all but the hardest of woods, screw heads tend to dig into the wood around

## FIGS. 3 SLOT SCREW





the slot, restricting or eliminating movement. To prevent this, I add a fender washer, which spreads the pressure over a wider area, as shown in Fig. 3A. (Available at most hardware stores, fender washers have small holes just right for common screw shanks.) If a protruding screwhead and washer will

be unsightly or in the way, I countersink the slot to accommodate them (Fig. 3B).

Although effective, slots can be a nuisance to make. When I worked in England, we used a nifty slotted brass washer (Fig. 3C). We countersunk the washer to hold it in place; beneath it a hole slightly smaller than the washer's

diameter gave the screw room to move. Unable to locate any slotted washers in this country, I occasionally make my own by filing slots in fender washers.

An even simpler method is to place a screw and large fender washer over an oversized hole (Fig. 3D). Depending on how firmly you tighten the screw, the washer slides or the screw tilts back and forth as the top moves. A flathead screw pivots somewhat better on its beveled lip than a roundhead screw. The method doesn't accommodate a lot of move-

## Making Wooden Buttons

It's quick to mill strips of buttons on the ends of wide boards. Plane the board to the buttons' thickness and square the ends. Form the tongues with two cuts against the rip fence, as shown (Photos 1 and 2).

Cut a button strip off each end, then sever individual buttons on the table saw (Photos 3 and 4).

Set up stops on the drill press and bore the clearance holes for the screw shanks (Photo 5).

Chamfers worked with a block plane give buttons a finished look (Photo 6).



Photo 1

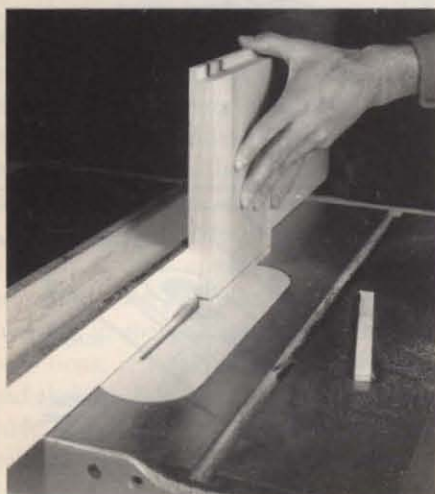


Photo 2

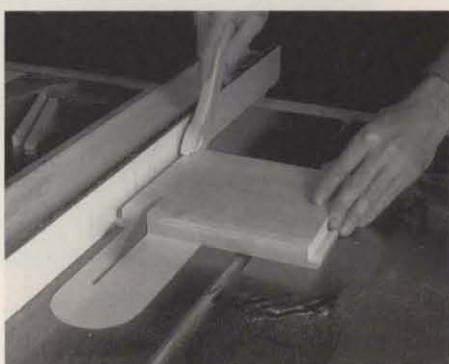


Photo 3



Photo 4

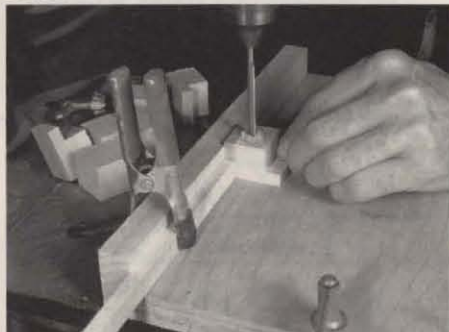
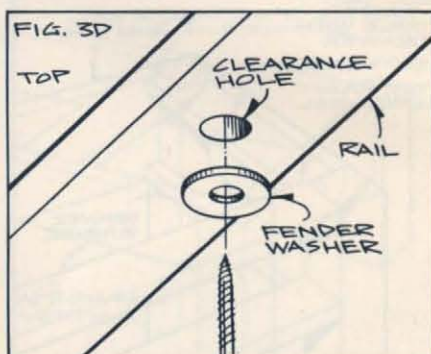
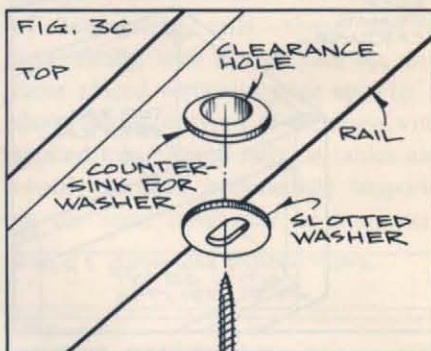


Photo 5



Photo 6



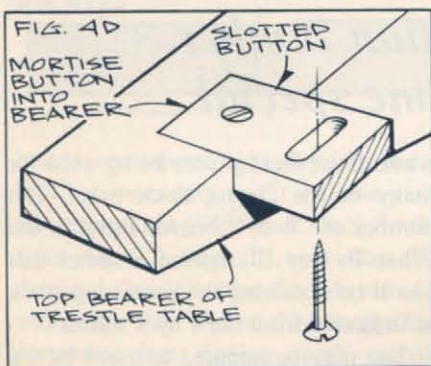
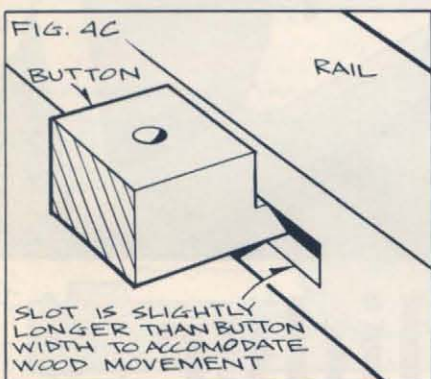
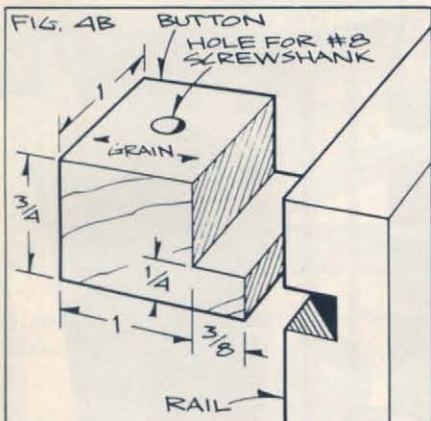
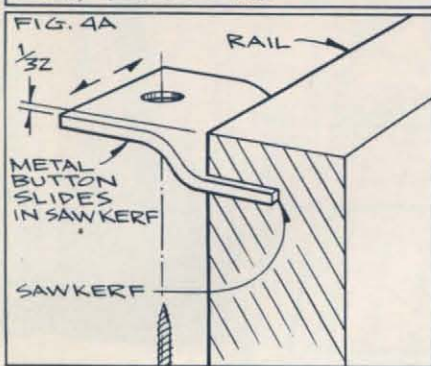
ment, and I wouldn't recommend or trust it for a good piece of furniture. I've used it to fasten pine desktops to wall-mounted brackets in my office and it's had no trouble handling  $\frac{3}{16}$  in. shrinkage in the winter.

## Buttons

The easiest way to fasten a tabletop to an apron rail is with bent metal "buttons" like the one in Fig. 4A. Just cut a single sawkerf on the inside face of each rail, and screw them in place. Position the kerf so the top of the button will fall  $\frac{1}{32}$  in. or so short of the top of the rail; that way the screw will pull the top tight to the rail. These buttons are best for slotting into rails running perpendicular to the grain of the top, since they slide along the length of the kerf as the top



FIGS. 4A BUTTONS



moves. Unfortunately, the tongues on the metal buttons I've found are too short to work well when slotted into the apron rails that parallel the grain—too much shrinkage on a wide top, and the tongues slide right out of the groove.

While metal buttons are fast and effective, I think their looks are as cheap as the few cents they cost to buy. Wooden buttons (Fig. 4B) are more trouble to make, but they look proper, as the English say. (All right, I admit that the only people who may appreciate the difference are other woodworkers, ones like me who crawl around under tables to check out the craftsmanship.)

Wooden buttons work the same way as metal ones, though they require a wider kerf in the rails (make two passes with a single blade or use a dado head). They're relatively easy to make, as shown in the step-by-step photo instructions. As with metal buttons, position the kerf so the screw will snug the top against the rail.

Several other wooden button variations also come in handy. If a continuous kerfed groove will be unsightly (on a trestle table, for example), I cut individual mortises in the top bearer to house individual button tongues, making the mortise long enough to accommodate anticipated movement (Fig. 4C). This technique is also useful for wide tops on apron-rail tables, where short-tongued buttons might slide free of grooves cut into the rails that parallel the grain of the top. Making deep individual mortises for long-tongued buttons accommodate considerable movement without weakening the rail, as would a deep groove cut along its full length. In its final variation, shown in Fig. 4D, slotted buttons housed or glued to the top of the rail or trestle bearer eliminate grooves or mortises altogether.

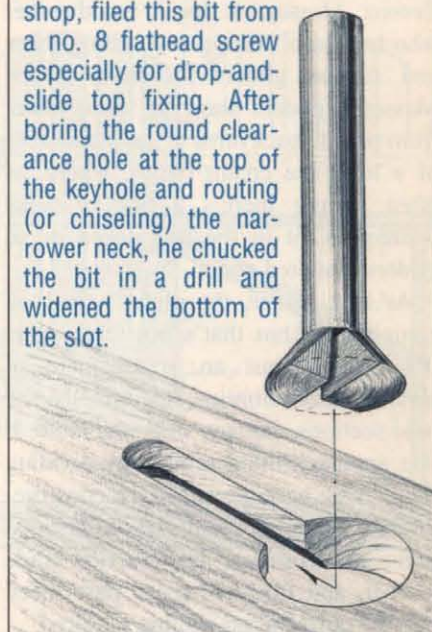
### Drop-and-Slide Fastenings

I once made a little cabinet with a very shallow top drawer and applied top. I slotted the top rails and top kickers for screws, but after assembling the carcass, I discovered I couldn't add the top. The 2 1/2 in. clearance between the wide runners and rails on which the drawer ran and the top rails and kickers was too small for my hand—or a screwdriver.

I solved that problem by boring holes through the drawer runners and rails, aligned with the slots above, then inserting a screwdriver through the holes. A more elegant solution, and one with

### Homemade Slotting Bit

George Taylor, a superb craftsman who worked for decades in Edward Barnsley's English workshop, filed this bit from a no. 8 flathead screw especially for drop-and-slide top fixing. After boring the round clearance hole at the top of the keyhole and routing (or chiseling) the narrower neck, he chucked the bit in a drill and widened the bottom of the slot.



other applications, is the drop-and-slide keyhole fastening shown in Fig. 2, which doesn't require that you work from inside the carcass.

Of the two versions shown, the one employing a keyhole cut in a metal plate is the easiest. You can make your own plates from brass or aluminum with a drill press and a thin file. Just countersink the plates into the top and rout or chisel recesses beneath them to clear the screw heads. If you prefer an all-wood version, you can rout keyholes with T-shaped necks into the top with a slotting bit.

The trickiest part of drop-and-slide fixing is positioning the keyholes. A good method is to insert nails into the pilot holes drilled in the rails for the screws—clip the nails so their points protrude 1/16 in. or so from the screw holes. Lowering the top carefully into place will mark on it the positions of the screws. Because you must drop the top over the screws, then slide it into position, the screws should fall somewhere in the middle of the narrow keyhole necks to allow for movement. You'll probably have to fuss a bit with the height of the screws—the top should slide on without undo force, but be drawn snugly against the carcass. 



**W**e've seen many different types of lawn swings and gliders, from simple A-frame designs to elaborate suspension systems using springs and cables. But none has duplicated the charm, fluid motion, and versatility of this classic New England glider. The glider pictured was built by Everett Massey, a local woodworker who has been making and selling these and similar gliders for many years. Massey's gliders show up everywhere from private backyards to the picnic area of a local ice cream parlor, where, as often as not there's a line of folks waiting to sit in the half-dozen or so gliders scattered about.

At first glance, the glider may look complicated, but that's not really true. It's actually just an arrangement of several subassemblies, specifically the base sections, canopy, seats and table. If you approach the assembly by dividing it up, as we have here, then the construction is vastly simplified. All of the wood parts are common construction-grade lumber, and many of these parts need only be crosscut, no ripping required.

The secret to the glider's captivating motion (our glider has fast become a favorite lunchtime spot at The Woodworker's Journal) is the pair of axles/wheels that the unit rides on. The wheels ride in identical curved recesses in the two base sections. The axles are just lengths of  $\frac{3}{4}$  in. O.D. (outside diameter) pipe or conduit, which is available at most hardware stores, but the high-impact plastic flanged wheels are a special item, so we've arranged with a mail-order supply outfit to provide them as a kit (see Wheel Source).

When seated in the glider, a light push with your feet on the base floor is all that's needed to set the glider gently rocking back and forth. The motion is so easy to achieve, even a child can do it, and so level and controlled that drinks on the table won't spill. This latter fact enables the glider to double as a backyard picnic table. It's not possible to describe here just how tranquilizing the motion of this glider can be, but suffice to say that it will bring back many happy memories, and become the focal point of many more memories of the long, slow, lazy, hazy days of summer.

#### Some Construction Notes

**Stock:** As shown in the What To Buy



## Lawn Glider

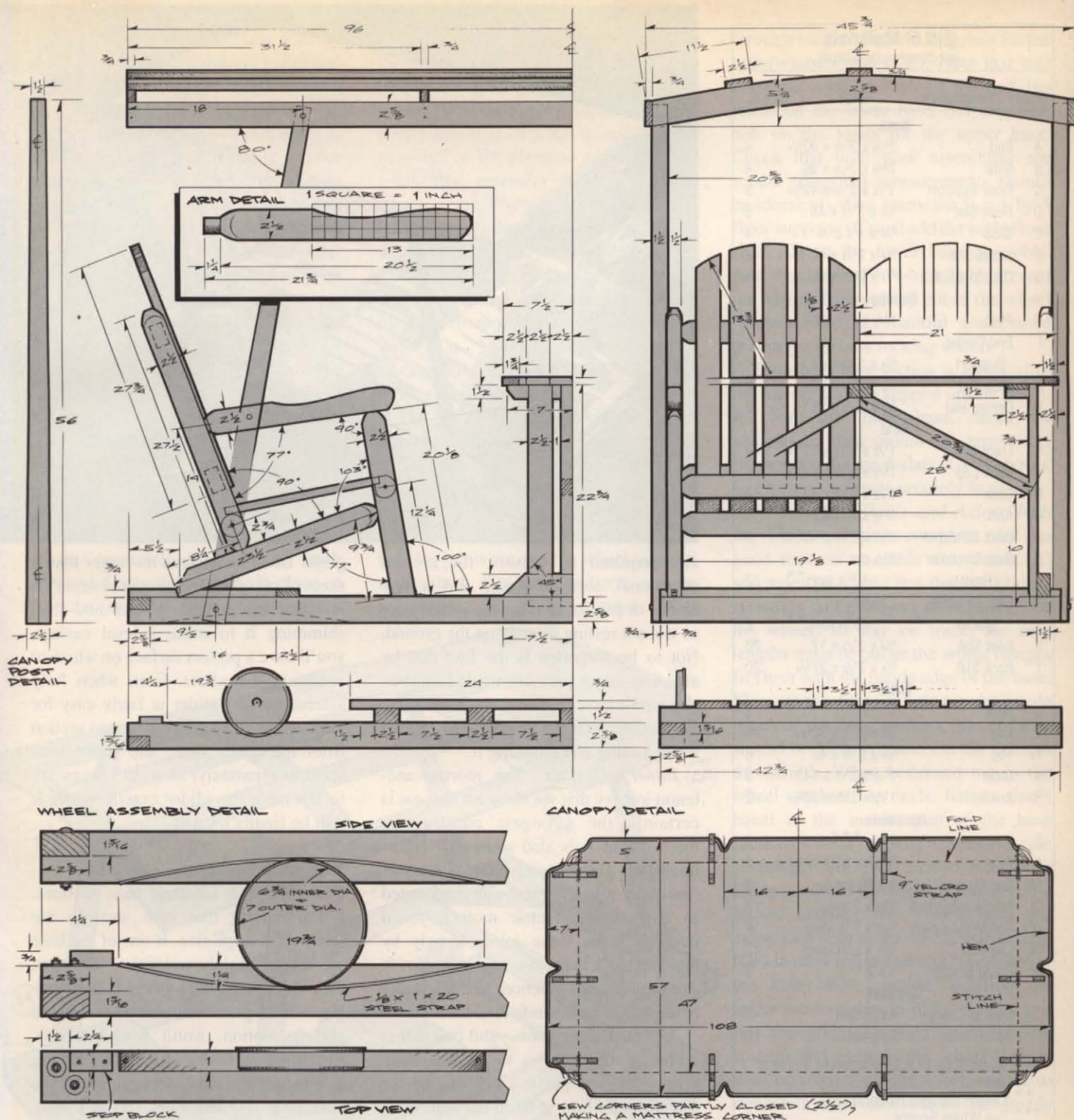
*Use low-cost construction lumber to build this summertime special*

illustration, the glider is made up primarily of 1 by 3's (actual size  $\frac{3}{4}$  in. thick by  $2\frac{1}{2}$  in. wide), 1 by 6's (actual size  $\frac{3}{4}$  in. thick by  $5\frac{1}{2}$  in. wide), 2 by 3's (actual size  $1\frac{1}{2}$  in. thick by  $2\frac{1}{2}$  in. wide), and 4 by 4's (actual size  $3\frac{1}{2}$  in. thick by  $3\frac{1}{2}$  in. wide). The remaining stock is a pair of round, 8 ft. long fence rails, from which the seat supports are cut. As also detailed in the What To Buy illustration, the 4 by 4 stock is ripped to yield the base ends and sides (final size  $2\frac{5}{8}$  in. thick by  $2\frac{5}{8}$  in. wide), with the

waste from these pieces being used for many of the  $\frac{3}{4}$  in. thick parts. The number of "1-by" boards listed in the What To Buy Illustration assumes that you'll be obtaining the remaining stock as indicated from the 4 by 4 waste.

You may be tempted to use 4 by 4's full size for the base parts, and just buy 1-by stock for all the slat parts, but if you want to go this route, you'll need to shorten up the axle length, adjust the location of the two outermost cleats on the table top, and shorten the two table





braces correspondingly. Ripping the 4 by 4's down is easy, and it will also yield all the required 3/4 in. thick stock for the floor slats (D), stops (E), cross slats (F), diagonal slats (G), plus the side slats (J) and center slats (K) on the canopy. Just remember that ripping stock usually releases tensions in the wood, so be sure to stack and clamp the ripped stock to prevent excessive warping, since it's likely to be some time before you actually use it. If you use the 4 by 4's full-size, instead of ripping them down,

buy sufficient additional 1-by stock to yield parts D, E, F, G, J, and K.

We show stock sizes and joinery details to match the glider in the photo, but you may want to make some changes based on what's available in your area. For example, if round fence-rail stock is not available where you live, feel free to substitute 2 by 3 construction lumber.

**What About Using Pressure-Treated Material?** Recently, we've had several queries from readers about the safety of using pressure-treated materials for out-

door furniture projects. (Pressure-treated material typically includes mildewcides, fungicides, and other chemicals.) This isn't an easy question to answer. Thousands of decks have been built with pressure-treated boards, and children and pets are running around on these decks barefoot, playing and sitting directly on the pressure-treated boards. Frankly, we aren't claiming that people are getting sick from coming into contact with pressure-treated material. But we are urging common sense. When



# Bill of Materials

(all dimensions actual)

| Part            | Description            | Size                                                                                              | No. Req'd. |
|-----------------|------------------------|---------------------------------------------------------------------------------------------------|------------|
| <b>Base</b>     |                        |                                                                                                   |            |
| A               | End                    | 2 <sup>5</sup> / <sub>8</sub> x 2 <sup>5</sup> / <sub>8</sub> x 42 <sup>3</sup> / <sub>4</sub>    | 4          |
| B               | Side                   | 2 <sup>5</sup> / <sub>8</sub> x 2 <sup>5</sup> / <sub>8</sub> x 96                                | 4          |
| C               | Floor Support          | 1 <sup>1</sup> / <sub>2</sub> x 2 <sup>1</sup> / <sub>2</sub> x 42 <sup>3</sup> / <sub>4</sub>    | 5          |
| D               | Floor Slat             | 3/4 x 3 <sup>1</sup> / <sub>2</sub> x 48                                                          | 8          |
| E               | Stop                   | 3/4 x 1 x 2 <sup>1</sup> / <sub>4</sub>                                                           | 4          |
| F               | Cross Slat             | 3/4 x 2 <sup>1</sup> / <sub>2</sub> x 42 <sup>3</sup> / <sub>4</sub>                              | 2          |
| G               | Diagonal Slat          | 3/4 x 2 <sup>1</sup> / <sub>2</sub> x 26 <sup>1</sup> / <sub>2</sub>                              | 4          |
| <b>Canopy</b>   |                        |                                                                                                   |            |
| H               | Post                   | 1 <sup>1</sup> / <sub>2</sub> x 2 <sup>1</sup> / <sub>2</sub> x 56                                | 4          |
| I               | End/Center Support     | 3/4 x 5 <sup>1</sup> / <sub>4</sub> x 44 <sup>1</sup> / <sub>4</sub> *                            | 4          |
| J               | Side Slat              | 3/4 x 2 <sup>5</sup> / <sub>8</sub> x 96                                                          | 2          |
| K               | Center Slat            | 3/4 x 2 <sup>1</sup> / <sub>2</sub> x 96                                                          | 3          |
| <b>Seat</b>     |                        |                                                                                                   |            |
| L               | Front Leg              | 1 <sup>1</sup> / <sub>2</sub> x 2 <sup>1</sup> / <sub>2</sub> x 21 <sup>3</sup> / <sub>8</sub> ** | 4          |
| M               | Back Leg               | 1 <sup>1</sup> / <sub>2</sub> x 2 <sup>1</sup> / <sub>2</sub> x 24 <sup>3</sup> / <sub>4</sub> ** | 4          |
| N               | Back                   | 1 <sup>1</sup> / <sub>2</sub> x 2 <sup>1</sup> / <sub>2</sub> x 28 <sup>3</sup> / <sub>4</sub> ** | 4          |
| O               | Arm                    | 1 <sup>1</sup> / <sub>2</sub> x 2 <sup>1</sup> / <sub>2</sub> x 21 <sup>3</sup> / <sub>4</sub> ** | 4          |
| P               | Back Stretcher         | 1 <sup>1</sup> / <sub>2</sub> x 2 <sup>1</sup> / <sub>2</sub> x 40 <sup>3</sup> / <sub>4</sub> ** | 4          |
| Q               | Seat Stretcher (Front) | 2 <sup>1</sup> / <sub>2</sub> dia. x 40 <sup>3</sup> / <sub>4</sub> long **                       | 2          |
| R               | Seat Stretcher (Back)  | 2 <sup>1</sup> / <sub>2</sub> dia. x 40 <sup>3</sup> / <sub>4</sub> long **                       | 2          |
| S               | Seat Slat              | 3/4 x 2 <sup>1</sup> / <sub>2</sub> x 17                                                          | 20         |
| T               | Back Slat              | 3/4 x 2 <sup>1</sup> / <sub>2</sub> x 27 <sup>3</sup> / <sub>4</sub>                              | 20         |
| <b>Table</b>    |                        |                                                                                                   |            |
| U               | Foot                   | 1 <sup>1</sup> / <sub>2</sub> x 2 <sup>1</sup> / <sub>2</sub> x 15                                | 2          |
| V               | Leg                    | 3/4 x 2 <sup>1</sup> / <sub>2</sub> x 22 <sup>3</sup> / <sub>4</sub>                              | 6          |
| W               | Top                    | 3/4 x 2 <sup>1</sup> / <sub>2</sub> x 42                                                          | 6          |
| X               | Cleat                  | 1 <sup>1</sup> / <sub>2</sub> x 2 <sup>1</sup> / <sub>2</sub> x 14                                | 3          |
| Y               | Brace                  | 1 <sup>1</sup> / <sub>2</sub> x 2 <sup>1</sup> / <sub>2</sub> x 20 <sup>3</sup> / <sub>4</sub>    | 2          |
| <b>Hardware</b> |                        |                                                                                                   |            |
| Z               | Wheel                  | 7 dia. ***                                                                                        | 4          |
| AA              | Axle                   | 3/4 dia. x 37 <sup>1</sup> / <sub>2</sub> long                                                    | 2          |
| BB              | Rail Strip             | 1 x 20 long                                                                                       | 8          |
| CC              | Bolt/Washer/Nut        | 5/16 x 3 long                                                                                     | 12         |
| DD              | Bolt/Washer/Nut        | 5/16 x 2 <sup>1</sup> / <sub>2</sub> long                                                         | 4          |
| EE              | Lag Bolt               | 5/16 x 2 <sup>1</sup> / <sub>2</sub> long                                                         | 12         |
| FF              | Angle Bracket          | 1 x 3                                                                                             | 4          |
| <b>Optional</b> |                        |                                                                                                   |            |
| GG              | Canvas Canopy          | As shown                                                                                          | 1          |
| HH              | Velcro Strip           | As shown                                                                                          | 10         |

\* Width of part I is before curved shape is cut.

\*\* Length includes tenon(s).

\*\*\* See Wheel Source.

## Wheel Source

The four special flanged wheels you'll need for the glider are available from Aspen Kits, 6 Hilltop Drive, Old Saybrook, CT 06475; tel (203) 388-6179. Specify Lawn Glider Wheel Kit. Cost is \$59.95 postpaid; checks or money orders only, please.

properly painted, ordinary construction lumber should be fine for the glider. Builder Massey has been making these for many years, using ordinary untreated construction lumber, and all that's usu-



ally required to prevent rot are an occasional coat of paint, and a few bricks or blocks to raise the glider base so it's not resting directly on the ground. Not to be forgotten is the fact that by avoiding using pressure-treated lumber, you won't have to worry about all those precautions that we're supposed to take when cutting and handling it.

**Joinery Options:** The mortise-and-tenon joinery that we show for the seat is certainly the strongest construction method, but it is also somewhat labor-intensive. Unless you have a tenoner (basically just a conical cutter mounted to a powerful electric motor), you'll have to make these joints largely by hand, using a hand saw and a drawknife to rough-shape the tenon, and a rounder to smooth it to the indicated final size.

A far simpler option—and one that is certainly adequate—is to just butt-and-screw the seat parts. Later on, in the discussion of how to build the seat, we'll give details on both the mortise-and-tenon and the butt-and-screw options.

## Getting Started

You should have all your materials and hardware, including the wheels and axles, on hand before starting construction. Except for the wheels, all the hardware should be available from any well-stocked hardware store or building supply center. Although the seats and table can be constructed inside, you'll need a good flat area outside for the base and canopy assembly. Since the entire

glider takes up an area no larger than a sheet of plywood, by laying a sheet of 3/4 in. plywood on the ground and then shimming it to make a level surface, you'll have a perfect surface on which to assemble the glider. Even when fully assembled, the glider is fairly easy for two men to move (lift off the top section from the lower base, and move both sections separately) so it isn't necessary to assemble the glider exactly where it will be finally located.

## The Base Sections

There are two identical base sections. It's important that both sections are exactly the same size. If one of the base sections is slightly wider than the other, then the free-floating wheel/axle assembly, which gives the glider its smooth gliding motion, won't work properly. Rip down your 4 by 4 stock to yield the 2<sup>5</sup>/<sub>8</sub> in. square base stock, then cut the base ends (A) and sides (B) to length. The half-lap joints that are used to join the base parts are easy to cut with a circular saw. Lay the joints out, set the blade depth to 1<sup>5</sup>/<sub>16</sub> in., make the shoulder cuts, then re-set the blade depth to 2<sup>5</sup>/<sub>8</sub> and make the end cuts. It helps to have a pair of sawhorses set up to work on the half-lap joints, especially when making the end cuts, where you are holding the saw vertically instead of in the usual horizontal position.

**Making the Wheel Recesses:** Now lay out and cut the semicircular wheel recesses. There are several ways to make



these recesses, but the easiest is with the router, starting with a straight cutter and then using a template and a pattern cutting bit (the ball bearing is on the top with a pattern-cutting bit). First, using as large a diameter straight cutter as your router can safely handle, and starting with a bit depth setting of no more than  $\frac{1}{4}$  in., begin clearing out the wheel recesses. There are eight semicircular recesses in all, so make the same cut on each of them. One easy way to do this is to lay the four base sides side-by-side across your sawhorses. Make several depth readjustments of the bit until the final 1 in. recess depth is established. Stay just a little away from the semicircular line establishing the recess bottom. Once the 1 in. recess depth has been achieved, switch to the pattern-cutting bit (you'll need a bit with a cutting length of at least 1 in.), make a template of the semicircle from  $\frac{1}{4}$  in. thick plywood, fasten the template in place on the base side, and clean up the semicir-

cle. To make the template, insert a nail in the plywood template stock,  $1\frac{1}{4}$  in. from one edge (this point represents the lowest point of the wheel recess) then bend a thin strip of scrap around the nail to points on the plywood edge,  $19\frac{3}{4}$  in. apart, that represent the ends of the wheel recess. Use a pencil to scribe the curve from the bent strip to the plywood, then cut and sand the curve smooth. You'll need to move the template to the seven remaining wheel recesses, cleaning the bottom of the wheel recess in the same way. You can order a pattern-cutting bit from MLCS (1-800-533-9298; order part no. 508).

The wheel recesses are lined with a galvanized steel strip (BB), anchored with screws. The strip serves as a rail, so the wheels don't ride on the wood, a situation that would result in wear.

*Assemble the Base Sections:* With the half-lap joints cut and the wheel recesses established, the base sections can be assembled. No glue is used. Drill

through each of the half-lap joints for the bolts/washers/nuts (CC). Note that two bolts are used in each of the half lap joints on the lower base, but only one bolt on the joints for the upper base. Check that both base assemblies are square (diagonal measurements should be identical), then screw the five 1 by 3 floor supports (C) and add the eight floor slats (D) to the lower base assembly. Add the stops (E), which help prevent the wheels from rolling out of the wheel recesses, should youthful exuberance produce a furious rocking action.

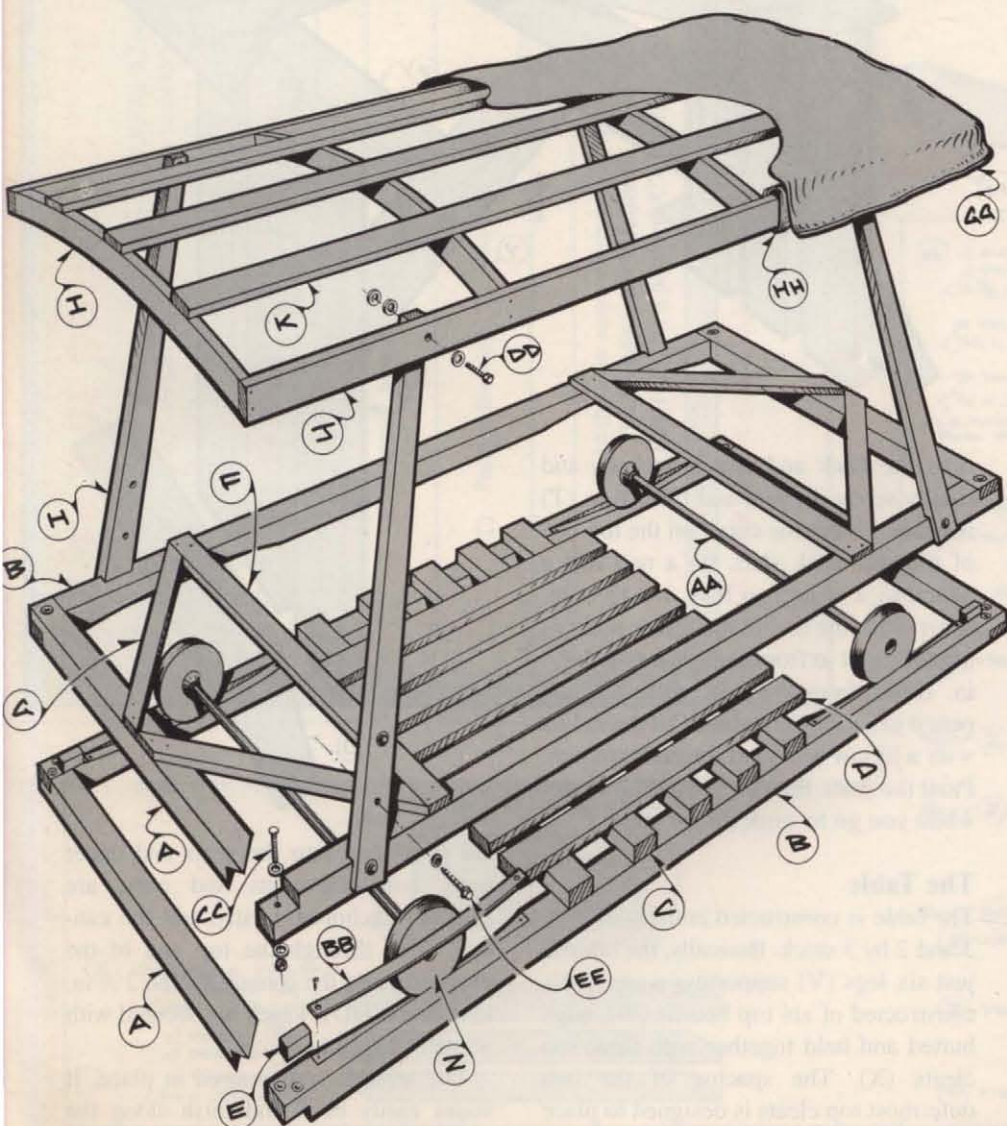
The upper base section is identical to the lower; it's just flipped upside down. As with the lower base, check for squareness, then mount the cross slats (F) and the diagonal slats (G) as shown, screwing these parts securely in place.

*Mount The Wheels and Axles:* With the two base sections complete, now is a good time to assemble the wheels (Z) and axles (AA) and test that the gliding system is going to work as intended. For the wheels to stay on track, the axle lengths must be cut so the wheel flanges fit flush with the inside edge of the base. Measure the distance between the inside edges of the base sections (the distance should be  $37\frac{1}{2}$  in.), and cut the axles to this length. When bottomed out in the wheel sockets, an axle length that's equal to the inside span of the base sections should result in wheels that ride perfectly, with no side-to-side play. Using a block of wood to cushion the blows, hammer the wheels onto the axles. Lay both of the wheel/axle assemblies in their respective wheel recesses in the lower base section, position the upper base section in place on top, and test the gliding motion. It should be smooth and even. If the wheel flanges bind or seem tight use a belt sander to remove a little stock from the inside edge of the base sides.

## The Canopy

Next up is making the canopy. The posts (H), which support the canopy, are just 2 by 3's (actual size  $1\frac{1}{2}$  in. by  $2\frac{1}{2}$  in.), tapered to  $1\frac{1}{2}$  in. wide at the top. Cut a  $\frac{3}{4}$  in. deep notch at the bottom end of the posts, where they mount to the upper base, cut the tapers, then paint the posts and set aside to dry.

The canopy itself is built from 1-by stock. Make the end and center supports (I) first. Find the centerpoint of a board





at least  $5\frac{1}{4}$  in. wide by  $44\frac{1}{4}$  in. long, measure  $2\frac{5}{8}$  in. from the bottom edge, insert a nail at this point, and then bend a thin ripping around this nail to points at the board ends. Scribe the curve with a pencil, repeat the process for the top curve, then cut the shape with a jigsaw or band saw. Sand smooth, then use this part as a template to trace the same shape onto the  $5\frac{1}{4}$  in. wide boards for the three remaining end/center supports. Screw the side and center slats (J, K) to the end and center supports, then paint the canopy and set aside to dry. Don't mount either the canopy or the posts yet.

## The Seats

The two seats are identical. As mentioned earlier, although most of the seat frame parts are 2 by 3 stock, as shown, the seat stretchers (Q, R) are fence rail stock. Use 2 by 3 stock for these parts as well, if you wish.

*If You Use Butt-and-Screw Joinery:* If you opt for butt joints and lag bolts to hold the seat frame together, then use the angles shown in the elevation views to cut the ends of the front and back legs (L, M), back (N), and arm (O) parts. Refer to the grid pattern for the arm profile, then cut with a band saw and gently round the top edges. Countersink for the bolt heads. Auto body filler called Bondo is perfect for filling these countersunk bolt holes before painting. Since butted and screwed joints won't have the strength of mortise-and-tenon joints, we do recommend that you add support cleats behind the two back stretchers (P) and under the front and back seat stretchers.

*If You Use the Mortise-and-Tenon:* Making the mortise-and-tenon joint shown is a 5-step process. Lay out the tenon, use a handsaw to establish the shoulders, then cut down from the ends to remove the bulk of the waste. Next, use a drawknife or a spokeshave to roughly shape the shoulders and tenon. To final round the tenon, you could use files or sandpaper, but an easier method is to use an old fashioned hand tool called a "rounder." Clamp the rounder in the bench vise, then turn the workpiece to shave the tenon to round. A set of two rounders, in  $1\frac{1}{4}$  in. and  $1\frac{1}{2}$  in. diameter sizes, is available from AMT, tel. (215) 948-0400. The set (order part no. A965) costs \$16.90. Once the tenon has been cut, use a drill or drill press to

bore the tenon holes. The drill press has a tilting table that will enable you to accurately get the hole angles right.

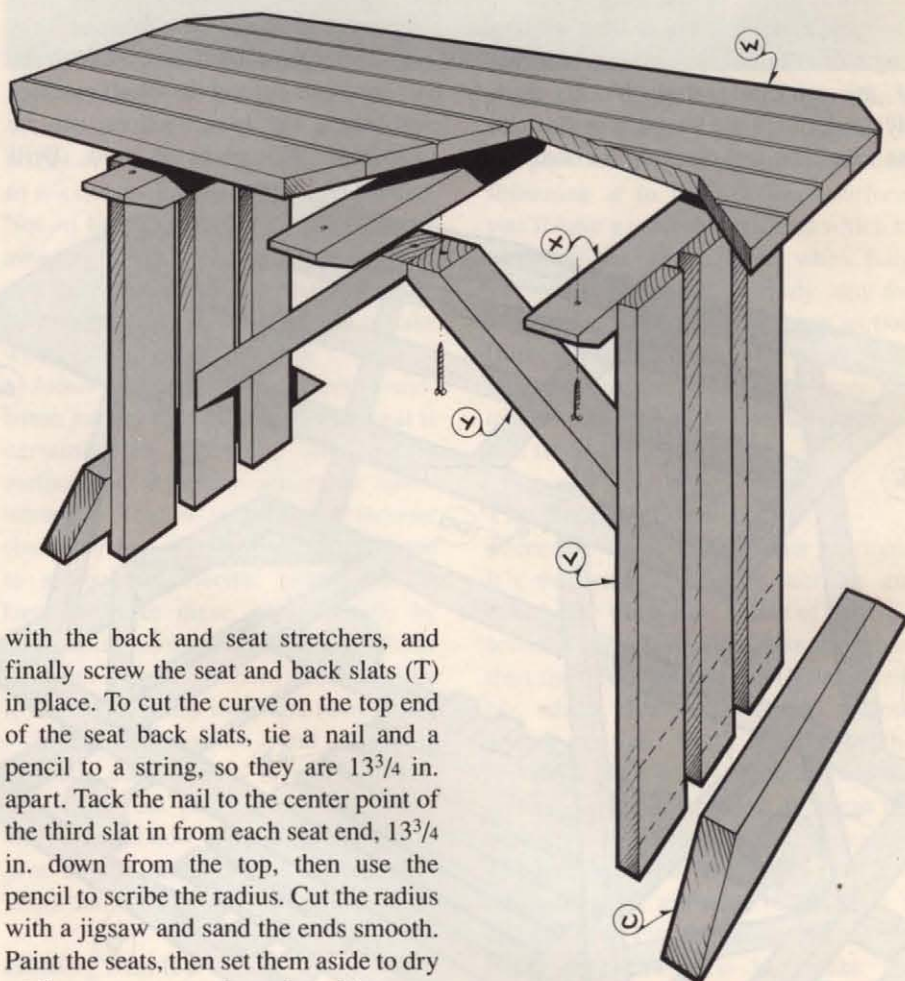
The assembly procedure for the seat frames is to first bore the hole in the front leg (located  $9\frac{3}{4}$  in. up from the bottom end) for the back leg, then bore the hole in the back leg ( $8\frac{1}{4}$  in. from the end) for the back. Next bore the hole in the back for the arm, and in the arm for the front leg, and finally bore the various back and seat stretcher holes. Join each of the leg/arm/back subassemblies, using glue and reinforcing the mortise-and-tenon joints with a nail or screw into each of the tenons.

Cut the  $\frac{3}{4}$  in. by  $\frac{3}{4}$  in. rabbet in the front seat stretcher for the seat slats (S), join the leg/arm/back subassemblies

the outside edges of the legs flush with the inside edges of the upper base. The feet (U) rest on the upper base. Add the two braces (Y), then paint the table and set aside to dry.

## Final Assembly

Mount each seat, using a pair of angle brackets (FF) to hold each front leg to the upper base. The brackets are just 1 in. wide steel (the same as you used to line the wheel recesses). Next mount the posts that support the canopy. Use lag bolts (EE) to fasten the posts into both the upper base and the seats. The easiest way to do the assembly is to use screws to first anchor the parts, and then drill for and add the lag bolts to reinforce the assembly later on. By bolting through



with the back and seat stretchers, and finally screw the seat and back slats (T) in place. To cut the curve on the top end of the seat back slats, tie a nail and a pencil to a string, so they are  $13\frac{3}{4}$  in. apart. Tack the nail to the center point of the third slat in from each seat end,  $13\frac{3}{4}$  in. down from the top, then use the pencil to scribe the radius. Cut the radius with a jigsaw and sand the ends smooth. Paint the seats, then set them aside to dry while you go to work on the table.

## The Table

The table is constructed entirely of 1 by 3 and 2 by 3 stock. Basically, the table is just six legs (V) supporting a top that's constructed of six top boards (W), edge butted and held together with three top cleats (X). The spacing of the two outermost top cleats is designed to place

the posts and into the seats and upper base, both the seats and posts are securely anchored. Lastly, add the canopy. Drill through the top end of the posts and into the canopy for the  $2\frac{1}{2}$  in. long bolts (DD), which are secured with washers and nuts.

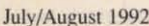
The table is not screwed in place. It slides easily back and forth along the



You may want to make a canvas canopy top (GG) for your glider. Cut the canvas to the size shown in our illustration, then fold and sew as indicated. The scalloped edge of the canvas top looks

The glider should be placed on a level

area. Use blocks or bricks to raise the unit slightly, so it isn't in direct contact with the ground. If a level area isn't available, you can shim to level the glider. 





**T**he Aeolian harp, or wind harp as it is also called, derives its name from Aeolus, the god of wind in ancient Greek mythology. Aeolus was said to hold the wind in caves or in bags, and released it only at his own choosing, or when ordered to by the gods.

Placed in a window on a breezy day, the harp strings vibrate to produce a fundamental tone with a number of harmonic overtones. The sound that results is most pleasing to the ear.

The earliest known examples of the Aeolian harp date back to the 1600's, but it's likely the ancient Greeks also made them. This design is courtesy of Connecticut woodworker Dave Moretti. It's made from cherry, with cherry plywood for the bottom, and laminated Sitka spruce for the soundboard. A mail-order source for the plywood and the laminated Sitka spruce is listed in Sources. Also listed is a source for the screws, tuning pins and string.

### Cut the Frame Parts

The frame consists of the front (A), back (B), and two ends (C). Cut each of these parts to the dimensions shown in the Bill of Materials. Once cut, use the table saw and dado head to cut the rabbets in the front and back that will later accept the soundboard (D) and bottom (E). Before cutting the rabbets though, it's best to have the stock for the soundboard and bottom on hand. That allows you to measure the actual thickness and adjust the rabbet depth for a perfect fit.

Also use the dado head to cut the  $\frac{5}{8}$  in. wide by 1 in. deep groove down the center of the front, the  $\frac{3}{16}$  by  $\frac{1}{4}$  in. rabbet on both ends of the back, and the  $\frac{3}{16}$  in. by  $\frac{3}{8}$  in. rabbet on the back end of the side.

### Assemble the Frame

The four frame parts can now be joined. To help keep the front from sliding out of position with the ends, it's a good idea first drive a couple of small brads in each end of the front, then clip the heads off so about  $\frac{1}{8}$  in. is exposed. Just be sure to locate the brads as shown in the Full-Size Section View to avoid any danger of them being hit by the table saw blade when the trimming cuts are made later.

Apply a thin coat of yellow or white glue to the mating frame parts, then assemble and clamp firmly. Once clamped, check for squareness and make

sure the top and bottom edges are flush.

### Add the Bottom, Glue Blocks and Soundboard

Measure the openings in the frame for the bottom and the soundboard, then cut each one to fit. Use care when making the cuts as you'll want a good fit all around.

As shown, the soundboard cloverleaves are located  $5\frac{5}{8}$  in. from each end of the frame. Each cloverleaf is made by drilling four,  $\frac{3}{4}$  in. diameter holes spaced  $\frac{3}{4}$  in. apart. When drilling, use a piece of scrap stock as a backing board to minimize tearout. The bottom does not have any cutouts.

The bottom can now be added to the frame. Apply glue to the rabbets in the front and back, then add the bottom and clamp it in place. Set aside to dry.

Next, measure the actual depth and width of the case and cut the 1 in. thick glue blocks (F) to fit. Use glue to secure them to the bottom and sides.

## Sources

Stock for the soundboard and bottom can be ordered from Musicmaker's Kits, 423 South Main Street, Dept. J5, Stillwater, MN 55082; tel. 1-800-432-5487. The soundboard is laminated Sitka spruce, the bottom is cherry plywood. Both parts are slightly oversized, measuring  $\frac{1}{8}$  in. thick by  $4\frac{1}{2}$  in. wide by 22 in. long. The price for both parts is \$18 postpaid. Should you need only one of the parts, the postpaid price is \$11 (specify soundboard or bottom). Musicmaker's also sells a tuning wrench. Order part no. TKEY-01; price is \$1.99, shipping included if ordered with wood; if ordered alone add \$4.

A hardware parts kit that includes four screws, eight tuning pins and four 46 in. long strings can be ordered from Aspen Kits, 6 Hilltop Drive, Old Saybrook, CT 06475; tel. (203) 388-6179. Cost is \$13. postpaid (checks and money orders only).

# Aeolian Harp

Now, add the soundboard. Apply glue to the front and back rabbets, and to the top of the glue blocks. Clamp securely and allow to dry.

### Shape the Front

The front can now be rounded as shown in the Full-Size Section View. All the rounding can be done with a rasp or hand plane, followed by some work with a scraper or sandpaper. However, to save time, we removed much of the stock by first making a couple of ripping cuts on the table saw with the blade set at the angles shown. To adequately support the frame while making the 60-degree cut, you'll need to attach a high (at least 5 in.) auxiliary fence to your rip fence. Make the 60 degree cut with the front edge of the harp riding on the saw table. Make the 45 degree cut with the bottom of the harp riding on the table.

### Make the Bridge

The two bridges (G) are next. As shown in Fig. 1., start with  $\frac{1}{2}$  in. thick stock at least  $2\frac{1}{2}$  in. wide and about 12 in. long. (The extra width and length makes it a safer cut.) Set the saw blade to cut the angle shown (Step 1), then flip the stock end-for-end and relocate the rip fence to make the second cut (Step 2). Now, crosscut the stock into two  $3\frac{1}{2}$  in. lengths. The 45 degrees degree bevel on each end can be cut by hand with a dovetail saw and sanded smooth.

### Apply the Finish

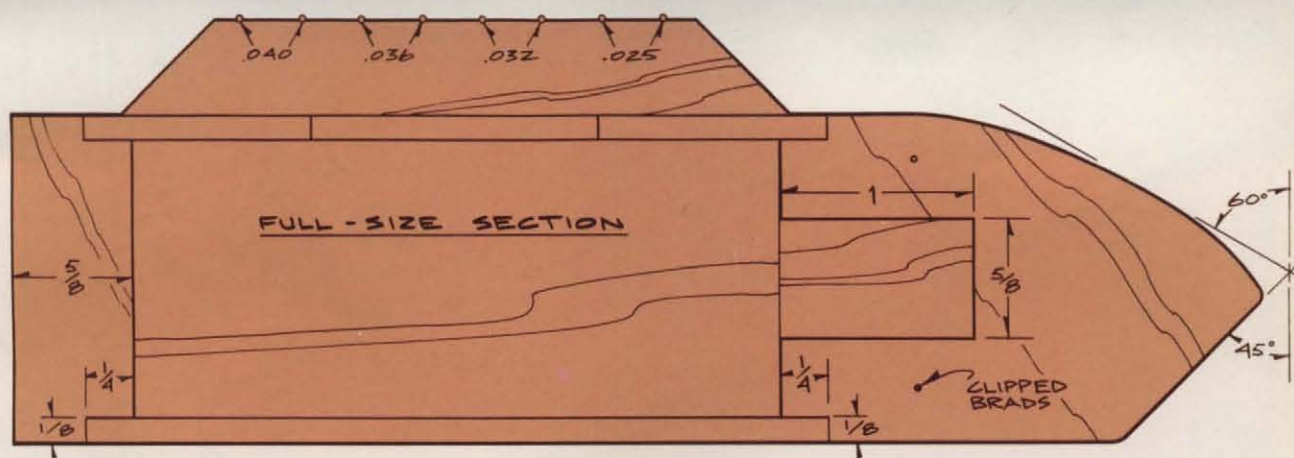
Give the entire harp a thorough sanding finishing with 220-grit. Use care when working on the bottom and soundboard, as it is easy to sand through the thin veneers. We used several coats of penetrating oil as a final finish.

### Add the Screws and Tuning Pins

Use the full-size pattern to locate the four holes for the screws (H) and the eight holes for the tuning pins (I). Using the drill press, bore  $\frac{3}{32}$  in. diameter by  $\frac{3}{4}$  in. deep pilot holes for the screws and  $\frac{3}{16}$  in. diameter by 1 in. deep holes for the tuning pins.



*Musical interludes from  
an open window and a  
steady breeze*



Add the screws, threading them to within about  $\frac{1}{8}$  in. of the soundboard. The tuning pins, which have fine threads, are threaded in until they bottom out in the 1 in. deep hole, leaving about  $\frac{3}{4}$  in. of the pin exposed. A small adjustable wrench will come in handy for turning the pins. A tuning wrench (see Sources) makes the job even easier.

### Mount the Strings

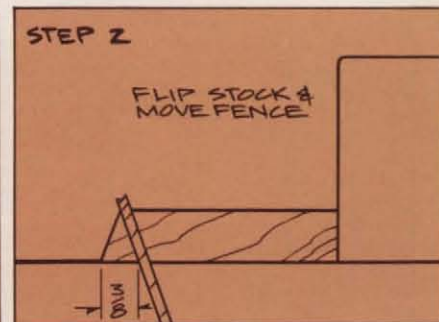
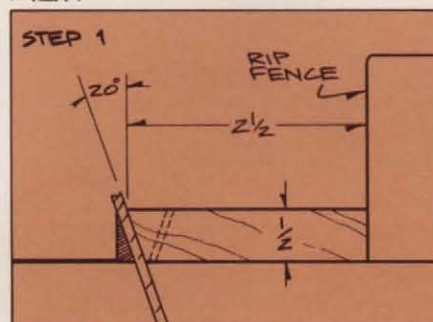
The harp requires four nylon strings, each one a different diameter—.025, .032, .036 and .040 in. Before attaching the strings, use a couple of pieces of masking tape to temporarily locate the bridges on the soundboard. Later, after

the strings are mounted, you can file a small notch at the exact string locations on each bridge.

The tuning pins have holes for mounting the strings. Work from the front, starting with the .025 diameter string

(see drawing for sequence). Insert one end through the hole in a pin until about  $\frac{1}{2}$  in. sticks out, then wrap the string in a clockwise direction around the pin three times. Bring the string around the screw shank and up through the adjacent

FIG. 1





pin. There should be enough slack in the string so that the pin will turn (thread) about three counterclockwise turns before the string stretches tight. Snip the excess. Repeat the procedure for the remaining strings.

Remove the masking tape from the bridges and file the notches. The bridges are not glued to the soundboard.

### Tuning Instructions

Tune the harp by bringing all the strings to one note, or, to put it another way, all the strings should sound the same when plucked. If you have a piano, tune the strings to the first G below middle C.

New strings will stretch, and tend to go out of tune rather quickly, so you may need to retune several times during the

first 24 hours. After that, the strings should stabilize and require only occasional tuning.

Place the harp on a windowsill with the rounded edge facing outside. Bring the window to within an inch or so of the strings. When Aeolus sends forth the first good breeze, your harp will come to life with its lovely harmonic sounds. 

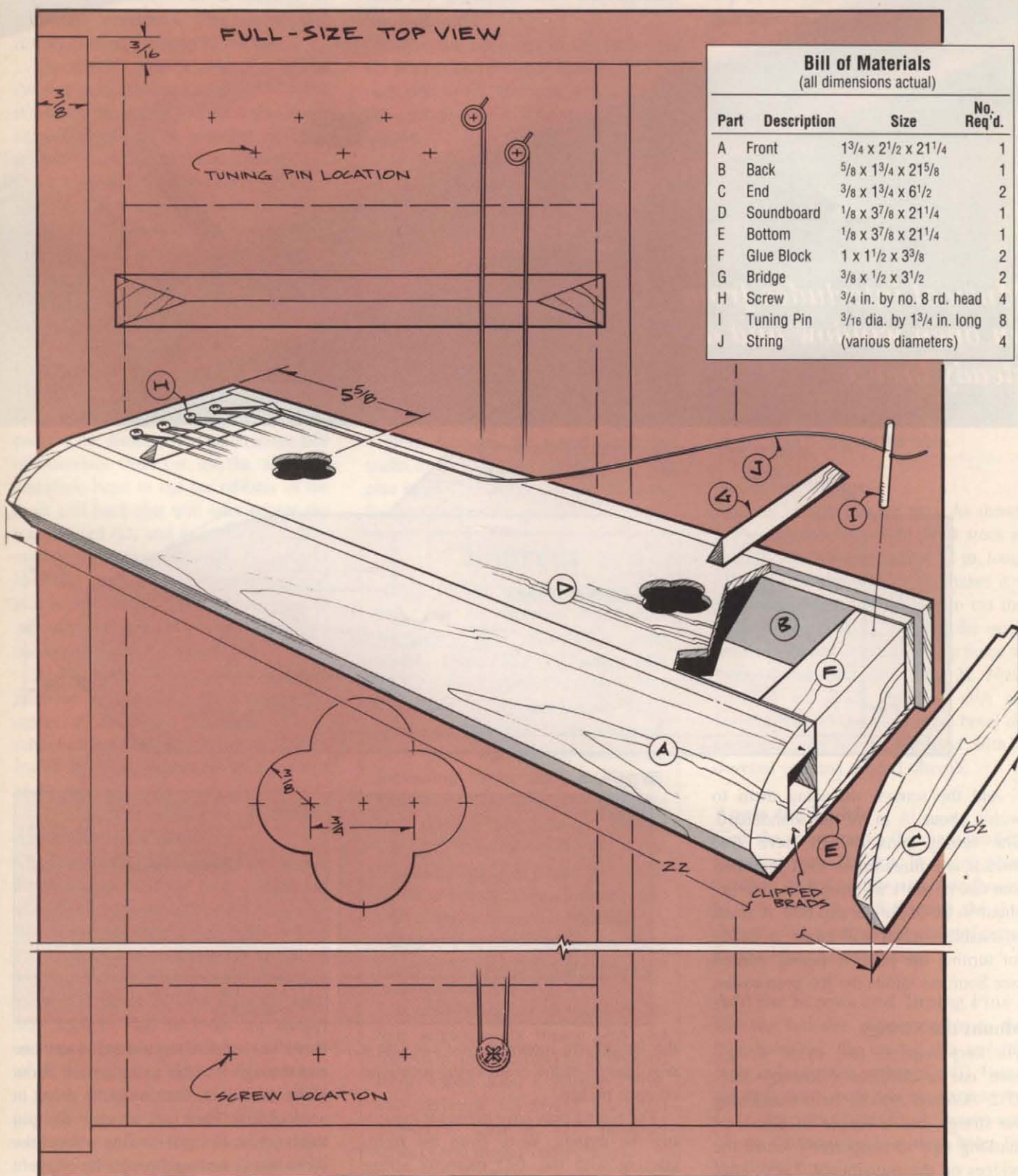
### FULL-SIZE TOP VIEW

TUNING PIN LOCATION

### Bill of Materials

(all dimensions actual)

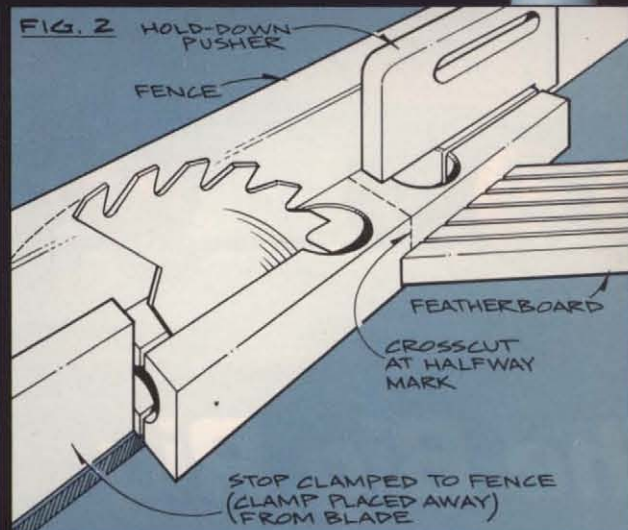
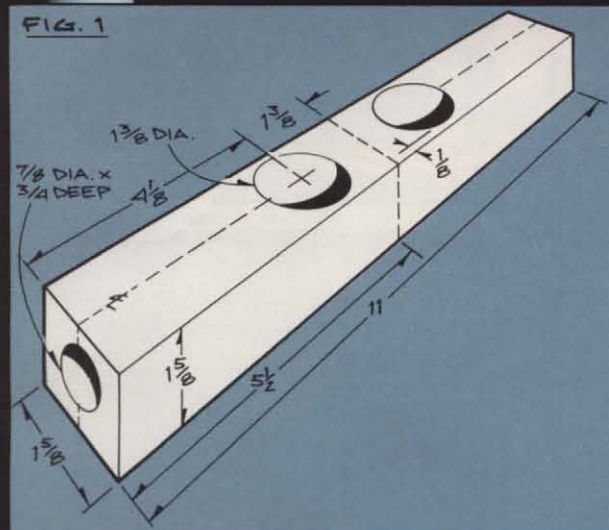
| Part | Description | Size                        | No. Req'd. |
|------|-------------|-----------------------------|------------|
| A    | Front       | 1 3/4 x 2 1/2 x 21 1/4      | 1          |
| B    | Back        | 5/8 x 1 3/4 x 21 5/8        | 1          |
| C    | End         | 3/8 x 1 3/4 x 6 1/2         | 2          |
| D    | Soundboard  | 1/8 x 3 7/8 x 21 1/4        | 1          |
| E    | Bottom      | 1/8 x 3 7/8 x 21 1/4        | 1          |
| F    | Glue Block  | 1 x 1 1/2 x 3 3/8           | 2          |
| G    | Bridge      | 3/8 x 1 1/2 x 3 1/2         | 2          |
| H    | Screw       | 3/4 in. by no. 8 rd. head   | 4          |
| I    | Tuning Pin  | 3/16 dia. by 1 3/4 in. long | 8          |
| J    | String      | (various diameters)         | 4          |





## Candle Holders

A great scrapbox gift project



These unique candle holders come to us courtesy of Brad and Sandy Smith, owners of Bradford Woodworking in Worcester, Pennsylvania. A saw kerf cut down the center of the holder creates a spring-clamp action that secures the candle. Ours are made from oak, although any straight-grained hardwood can be used. This procedure results in a pair of candle holders.

To begin, you'll need a piece of stock measuring  $1\frac{5}{8}$  in. square by 11 in. long (Fig. 1). For safety's sake, avoid using stock that's any shorter than 11 in. Mark a center point  $4\frac{1}{8}$  in. from each end, then use the drill press and a  $1\frac{3}{8}$  in. diameter Forstner bit to bore a pair of through-holes as shown. Also, bore the candle hole on each end. Although our candles needed a  $\frac{7}{8}$  in. diameter by  $\frac{3}{4}$  in. deep hole, other candles may require a different hole size. It's best to check your candles before boring. Next, set your table saw blade to a height of 3 in. and locate the rip fence so that the blade will make a cut exactly down the center of the stock. Clamp a stop block to the rip fence, taking care to locate the block so that it will stop the stock as soon as the saw blade kerf extends to the  $1\frac{3}{8}$  in. diameter hole (Fig. 2). Include a featherboard in the setup to help hold the stock against the rip fence.

Start the saw, then begin feeding the stock. Be sure to use a hold-down pusher to keep your hands well away from the saw blade. When the stock contacts the stopblock, shut off the saw and allow it to come to a complete stop, then remove the stock from the blade. Flip the stock end for end and repeat the cut on the other end.

Now, lower the blade to  $1\frac{3}{4}$  in. and crosscut the stock into two  $5\frac{1}{2}$  in. lengths. Final sand, then apply two coats of penetrating oil for a final finish.







## ***The Big Rig***

*A tractor/trailer toy for the budding long-hauler*

Judging from the selection on the shelves of your local toy store, it's easy to assume that if it isn't brightly colored and made of plastic, then kids won't like it. How mistaken. Through first hand experience, we've learned that when it comes to holding a child's interest, there's nothing better than well-made classic designs in wood.

Fred Cairns and Kathy Dawson, working in a small shop in Greenleaf, Kansas, have confirmed this enduring interest. Their line of wooden cars, trucks, tractors, etc. has become something of a standard. Though a number of other builders are now copying their style, we think their distinctive originals still offer the best combination of good looks and easy construction. Long-time subscribers will note that this piece shares design elements with the Pickup Truck (November/December 1988), the Roadster (March/April 1991), and the Dump Truck (September/October 1991). To help you in making the project, once again Lynes Unlimited has

agreed to supply a kit that includes all the wheels and pegs that you'll need (see Parts Kit Ordering Information).

The Big Rig is easy to make if you follow our simple instructions. Broken down into its elements, the project is just a series of blocks with wheels and pegs added. Most of the parts are oak, but the padauk grill on the cab and the stripe of padauk on the trailer sides adds just the right touch of class.

### **The Cab**

The cab is basically a combination of several subassemblies. First, cut the various parts to length and width. Once the chassis (A), hood (B), lower hood (C), grill (D), cab front/back (E), roof (F), seat parts (G, H), and doors (I) have been sized, you can go to work on the first subassembly—the hood, lower hood and grill. Use the table saw to establish the kerfs in the lower hood that represent the engine compartment louvers. Glue the hood and grill blocks to the lower hood, then scribe a 2 1/2 in.

radius curve for the hood top profile, cut the curve with the band saw, sand the curve smooth and gently round the top and side edges of the grill front. Next, use a 3/16 in. radius roundover bit in the router table to establish the stepped roundover detail on the top front end of the chassis.

Mount the hood/lower hood/grill subassembly to the chassis, locating it 1/2 in. from the chassis front end, then drill the holes for the various controls inside the cab—the steering column (O), gear shift (P), and pedal pegs (BB). The cab detail shows the placement of these parts. Mount the medium wheel (X) that serves as the steering wheel to the steering column, then glue the column, the gear shift and the pedal pegs into their respective holes. It's important to mount these parts now, since access inside the cab is restricted once the cab front/back, roof and doors are in place.

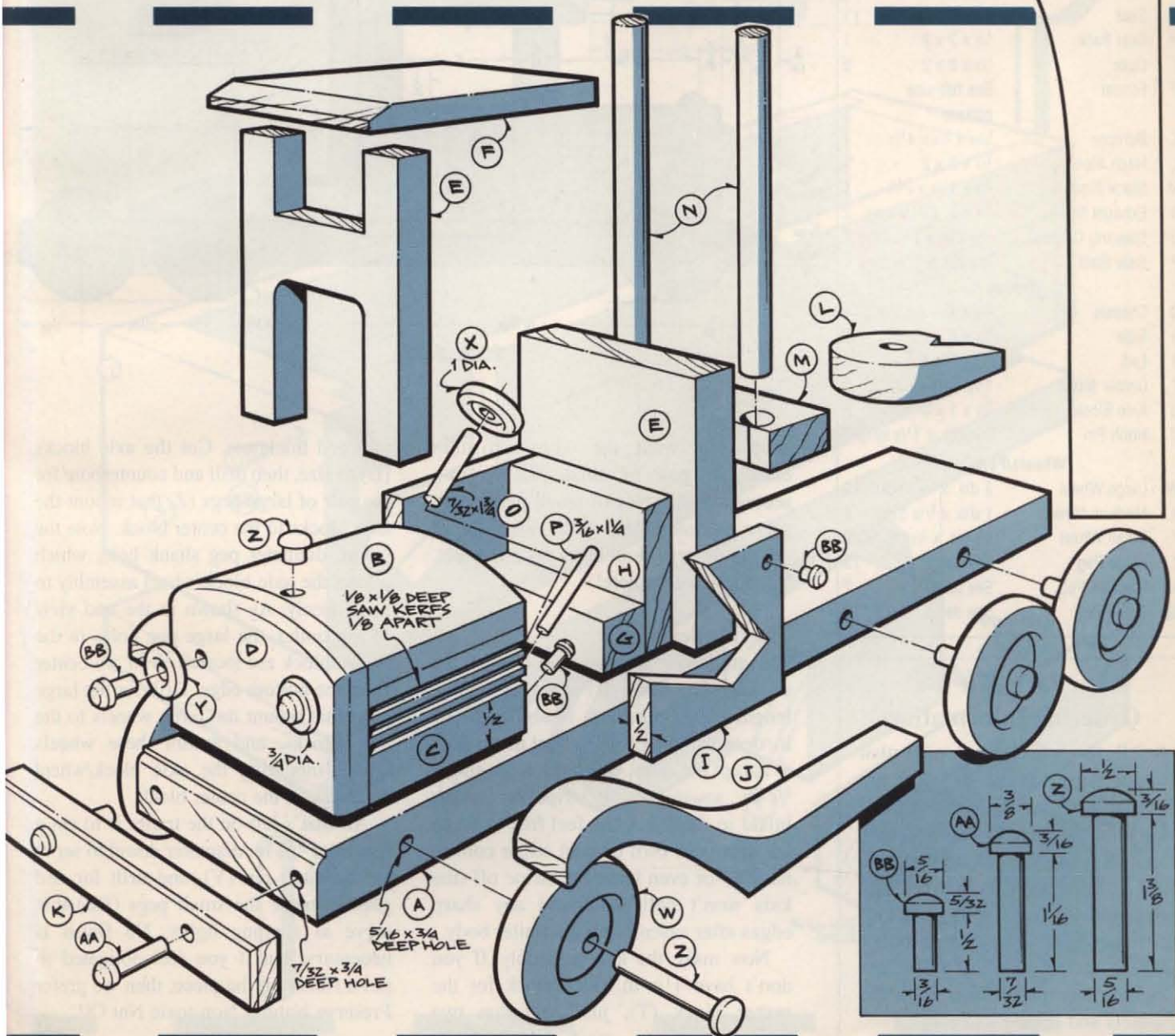
The cab front and back are the same size, but as the exploded view shows, there are cutaways in the cab front for



Now move to the drill press (or you can use a hand drill, so long as your holes are accurate) and drill the axle peg holes. Your parts kit will include 13 large pegs (Z); six are used to hold the six large wheels (W) on the cab, and one large peg is cut short to serve as the radiator cap.

All that's left on the cab is mounting the wheels and adding a few decorative details. Don't press the axle pegs in too

PART J:  
FULL - SIZE  
PATTERN





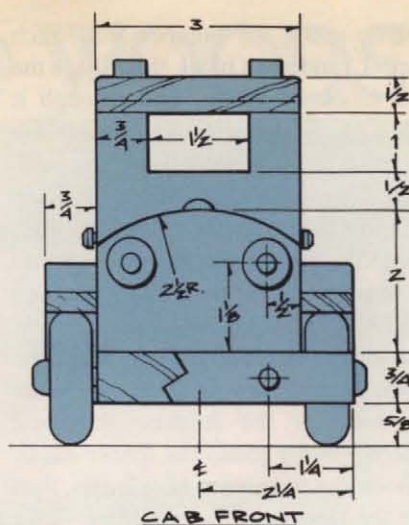
### Bill of Materials (all dimensions actual)

| Part                | Description     | Size                                             | No. Req'd. |
|---------------------|-----------------|--------------------------------------------------|------------|
| <b>Cab</b>          |                 |                                                  |            |
| A                   | Chassis         | $\frac{3}{4}$ x 3 x 13                           | 1          |
| B                   | Hood            | $\frac{3}{4}$ x 3 x $2\frac{1}{2}$               | 1          |
| C                   | Lower Hood      | $1\frac{1}{4}$ x 3 x $2\frac{1}{2}$              | 1          |
| D                   | Grill           | $\frac{3}{8}$ x 3 x 2                            | 1          |
| E                   | Cab Front/Back  | $\frac{3}{4}$ x 3 x $3\frac{1}{2}$               | 2          |
| F                   | Roof            | $\frac{1}{2}$ x 3 x 4                            | 1          |
| G                   | Seat            | $\frac{3}{4}$ x $\frac{3}{4}$ x 2                | 1          |
| H                   | Seat Back       | $\frac{1}{2}$ x 2 x 2                            | 1          |
| I                   | Door            | $\frac{1}{2}$ x 2 x 2                            | 2          |
| J                   | Fender          | See full-size pattern                            | 2          |
| K                   | Bumper          | $\frac{5}{16}$ x $\frac{3}{4}$ x $4\frac{1}{2}$  | 1          |
| L                   | Hitch Block     | $\frac{3}{4}$ x 2 x 2                            | 1          |
| M                   | Stack Block     | $\frac{3}{4}$ x $1\frac{1}{8}$ x $2\frac{3}{4}$  | 1          |
| N                   | Exhaust Stack   | $\frac{1}{2}$ dia. x $4\frac{1}{4}$ long         | 2          |
| O                   | Steering Column | $\frac{7}{32}$ dia. x $1\frac{3}{4}$ long        | 1          |
| P                   | Gear Shift      | $\frac{3}{16}$ dia. x $1\frac{1}{4}$ long        | 1          |
| <b>Trailer</b>      |                 |                                                  |            |
| Q                   | Chassis         | $\frac{3}{4}$ x $4\frac{1}{2}$ x $13\frac{3}{4}$ | 1          |
| R                   | Side            | $\frac{5}{8}$ x 3 x 13                           | 2          |
| S                   | End             | $\frac{3}{4}$ x 3 x $4\frac{1}{2}$               | 2          |
| T                   | Center Block    | $1\frac{1}{2}$ x $1\frac{3}{4}$ x 3              | 1          |
| U                   | Axle Block      | $\frac{3}{4}$ x 1 x 4                            | 2          |
| V                   | Hitch Pin       | $\frac{5}{16}$ dia. x $1\frac{1}{2}$ long        | 1          |
| <b>Wheels/Pegs*</b> |                 |                                                  |            |
| W                   | Large Wheel     | 2 dia. x $\frac{5}{8}$ thick                     | 10         |
| X                   | Medium Wheel    | 1 dia. x $\frac{5}{16}$ thick                    | 1          |
| Y                   | Small Wheel     | $\frac{3}{4}$ dia. x $\frac{3}{16}$ thick        | 2          |
| Z                   | Large Peg       | See detail                                       | 13         |
| AA                  | Medium Peg      | See detail                                       | 2          |
| BB                  | Small Peg       | See detail                                       | 12         |

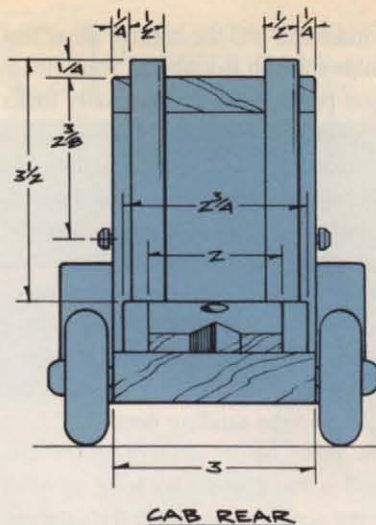
### Parts Kit

#### Ordering Information

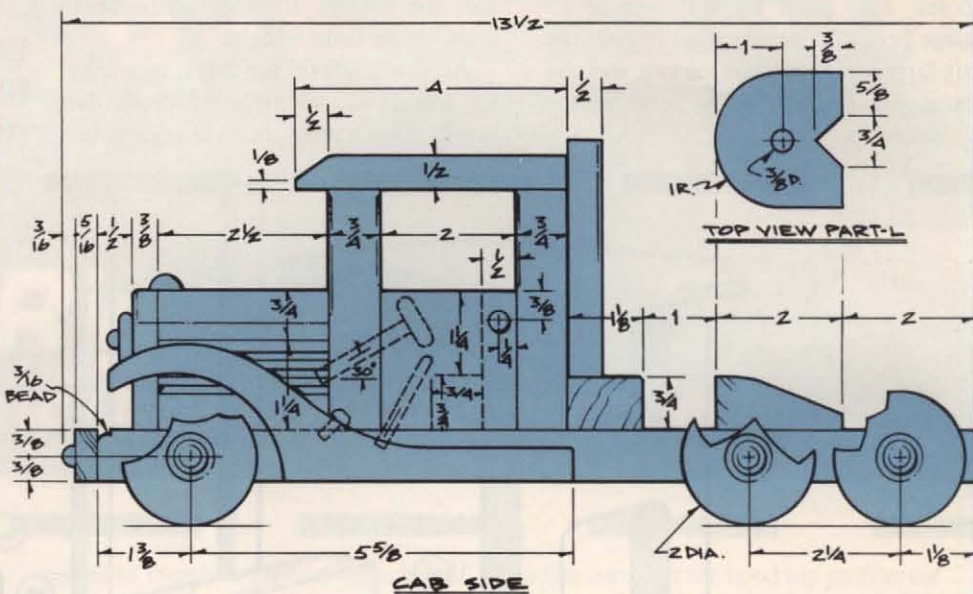
\* All the wheels and pegs that you'll need for the Big Rig are available in a kit. Write or call Lynes Unlimited, Route 2, Greenleaf, KS 66943; tel. (913) 747-2612. Specify Parts Kit for Big Rig (cost is \$12.50 postpaid; checks or money orders only). Please note that kit does not include any parts other than the wheels and pegs.



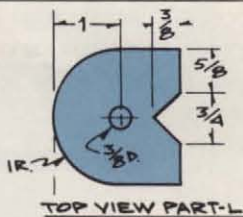
CAB FRONT



CAB REAR



CAB SIDE



TOP VIEW PART-L

deep—you want the wheels to turn easily. A pair of small wheels (Y), secured with a pair of small pegs (BB), serve as headlights, while two more of the small pegs double as door handles. Your cab is complete!

### The Trailer

The trailer is an easy build. Cut the chassis (Q), sides (R) and ends (S) to length and width, then establish the  $\frac{3}{8}$  in. deep by  $\frac{5}{8}$  in. wide rabbet in the ends to accept the sides. Our truck has a single  $\frac{1}{4}$  in. square accent stripe of padauk inlaid in the sides, but feel free to come up with your own custom stripe combination—or even leave the stripe off (the kids won't notice). Round any sharp edges after assembling the trailer body.

Now make the axle assembly. If you don't have  $1\frac{1}{2}$  in. thick stock for the center block (T), just face-glue two pieces of  $\frac{3}{4}$  in. stock to yield the

required thickness. Cut the axle blocks (U) to size, then drill and counterbore for the pair of large pegs (Z) that mount the axle blocks to the center block. Note the  $\frac{3}{8}$  in. diameter peg shank hole, which allows the axle block/wheel assembly to pivot freely. As shown in the end view of the trailer, the large peg holes in the center block are located  $\frac{3}{8}$  in. on-center from the bottom edge. Drill for the large pegs that mount the large wheels to the axle blocks, and mount these wheels before mounting the axle block/wheel assembly to the center block.

All that's left on the trailer is to cut a length of  $\frac{5}{16}$  in. diameter dowel to serve as the hitch pin (V), and drill for and glue in place the small pegs (BB) that serve as running lights. No finish is necessary, but if you feel obligated to put a finish on the piece, then we prefer Preserve Natural Non-toxic Nut Oil.





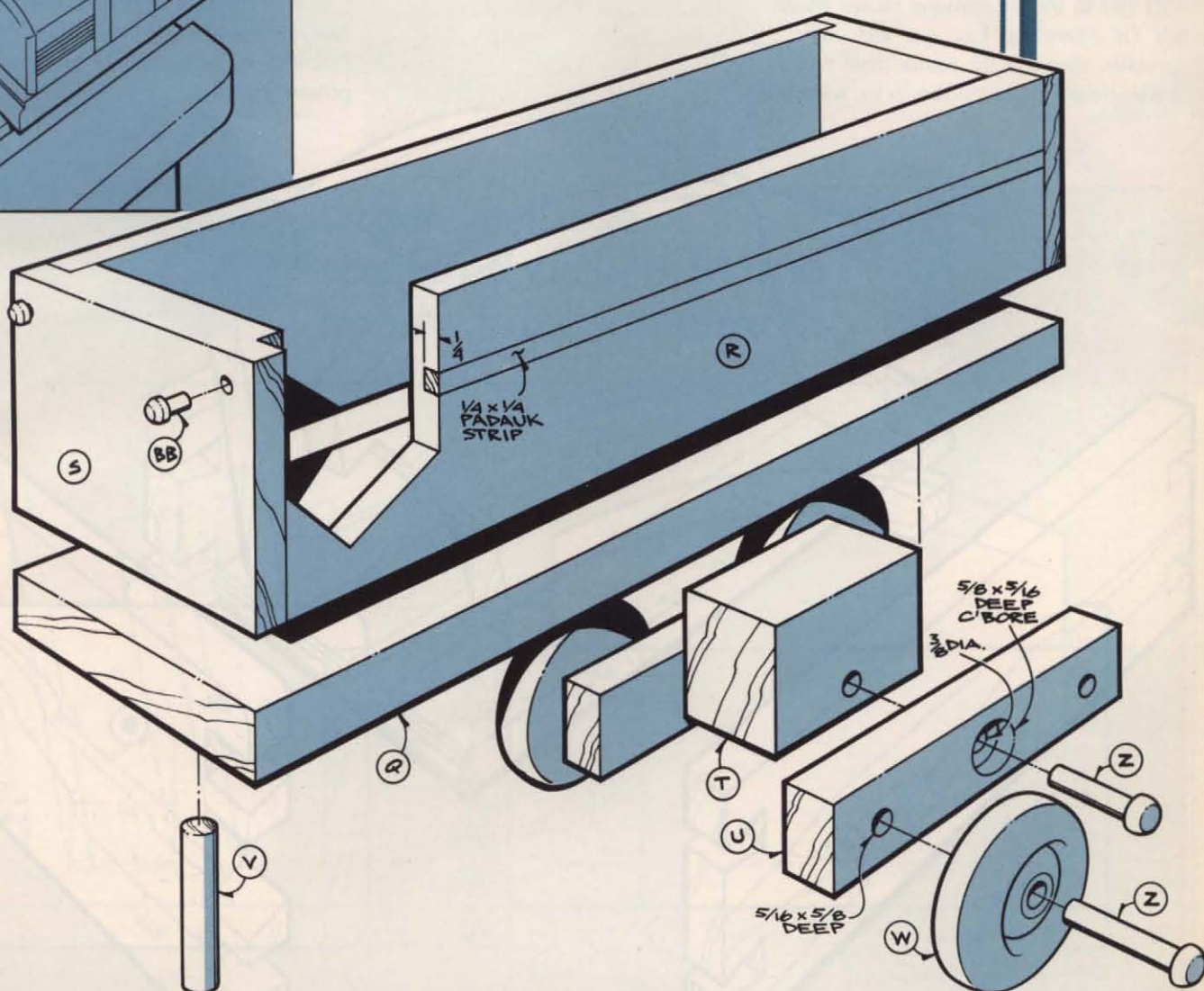
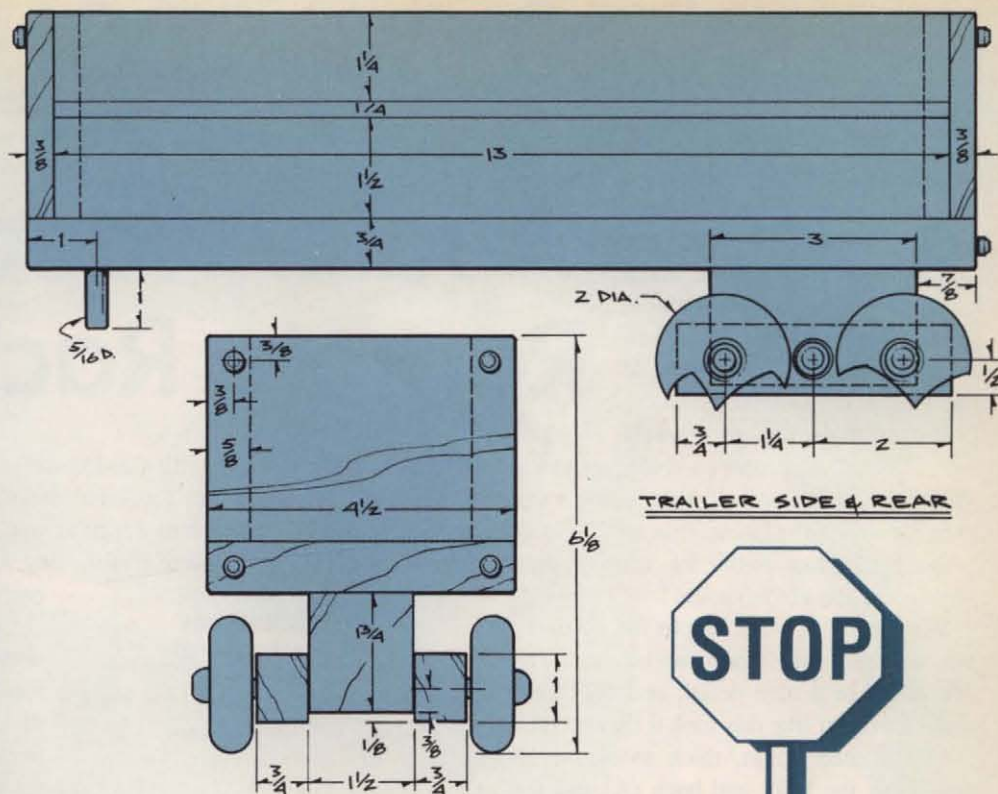
CAB DETAIL

Technical drawing of a cabinet detail, showing a side view of the cabinet structure. The drawing includes dimensions for the door, drawers, and internal components.

Dimensions shown:

- Overall height:  $15\frac{1}{8}$
- Door height:  $7\frac{1}{8}$
- Door width:  $1\frac{1}{8}$
- Drawer height:  $5\frac{1}{8}$
- Drawer width:  $7\frac{1}{8}$
- Internal drawer width:  $3\frac{1}{8}$
- Internal drawer width:  $3\frac{1}{8}$
- Internal drawer width:  $7\frac{1}{8}$

### SANDING DETAIL





As we add more electronic components to our homes, we seem to add a corresponding number of remote control devices. Most TV's now come with them, so do many of the VCR and CD units.

But as more remote controls are collected, it becomes a challenge to keep tabs on each one. We think this project will help. It holds several "remotes" and even a copy of the latest issue of *TV Guide*. Our rack sits on a table, but it can easily be wall mounted should you fear misplacing the entire rack.

We used bird's-eye maple for all parts, although most any wood can be used. The dovetails are a nice detail, and they help make a project like this look a bit special.

You'll need 1/2 in. thick stock for all parts. Cut the front and back (A) and the ends (B) to the dimensions shown in the Bill Of Materials. Lay out and cut the dovetails, then use the router table with a 1/4 in. straight bit to cut the 1/4 in. wide by

## Audio/Video Remote Rack

1/8 in. deep groove in each end. The four corners on each end are rounded to a 3/8 in. radius with a file or disk sander.

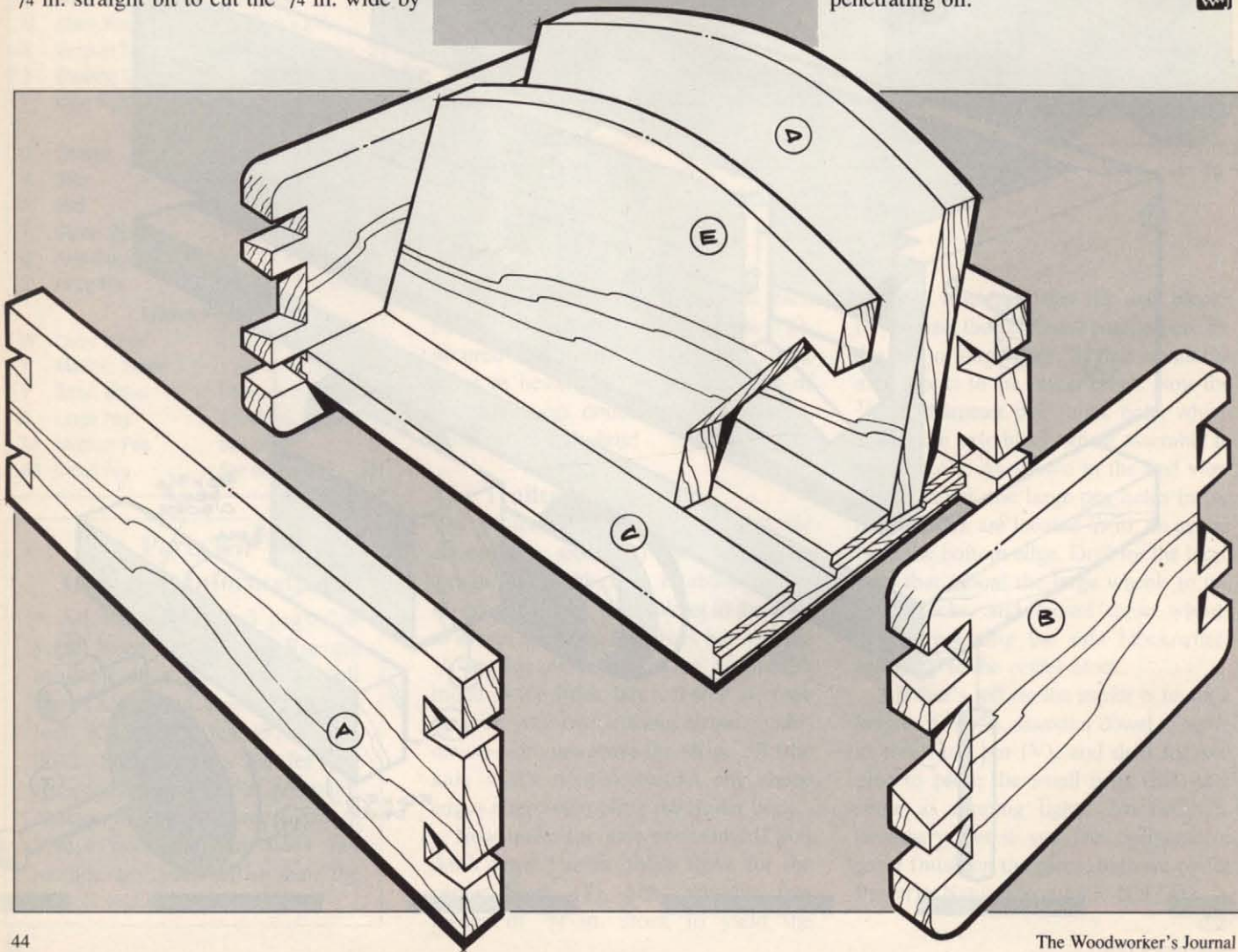
The bottom (C) is made from 4 in. wide stock. Cut it to at least 12 in. long, then cut the two 1/2 in. wide grooves using the table saw with a dado head set at a 10 degree angle. The 12 in. length makes for safer dado head cuts. After cutting the grooves, switch to a regular saw blade and crosscut the stock to its final length of 6 1/4 in. long. Use the router table to cut the tenons on each end.

Cut the wide divider (D) and narrow divider (E) to size and round the top edges. Final sand all the parts, then glue the dividers to the bottom before adding the front, back and sides. Clamp securely and set aside to dry.

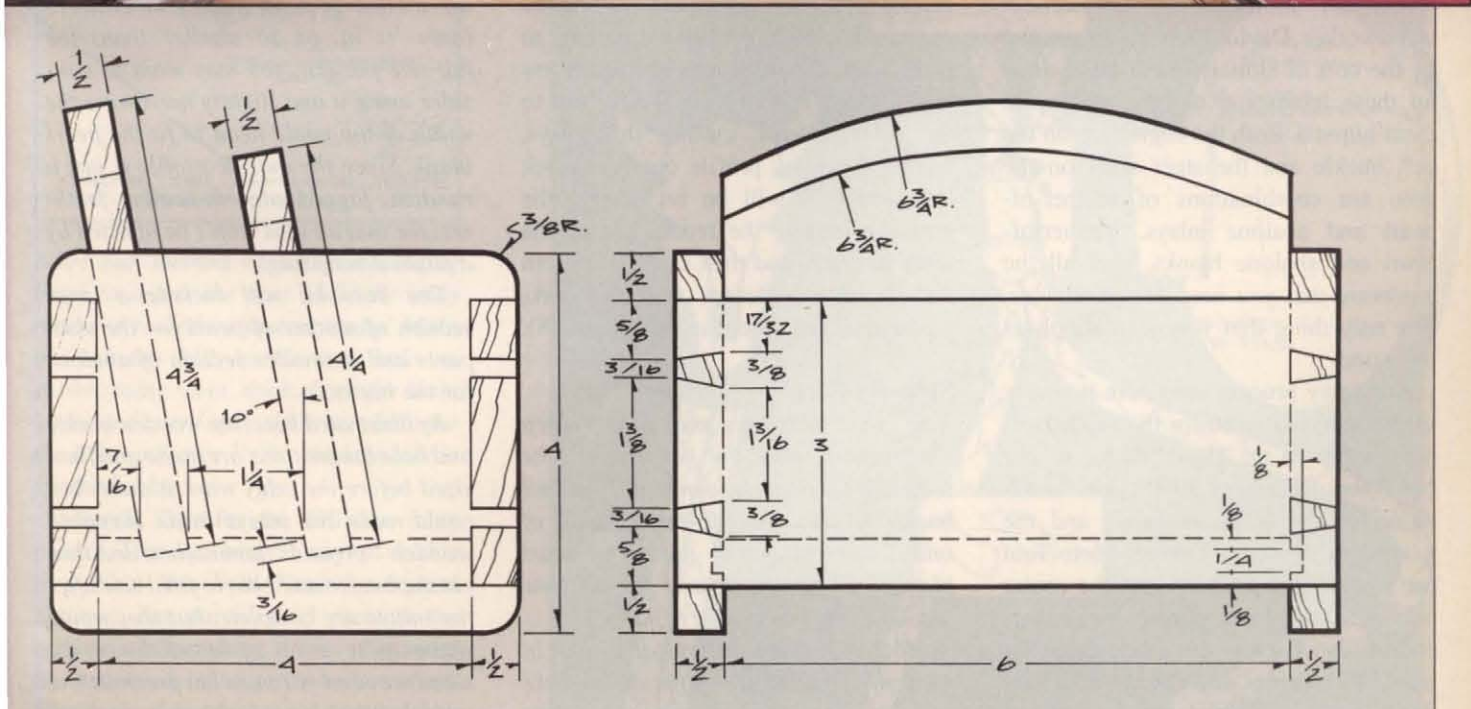
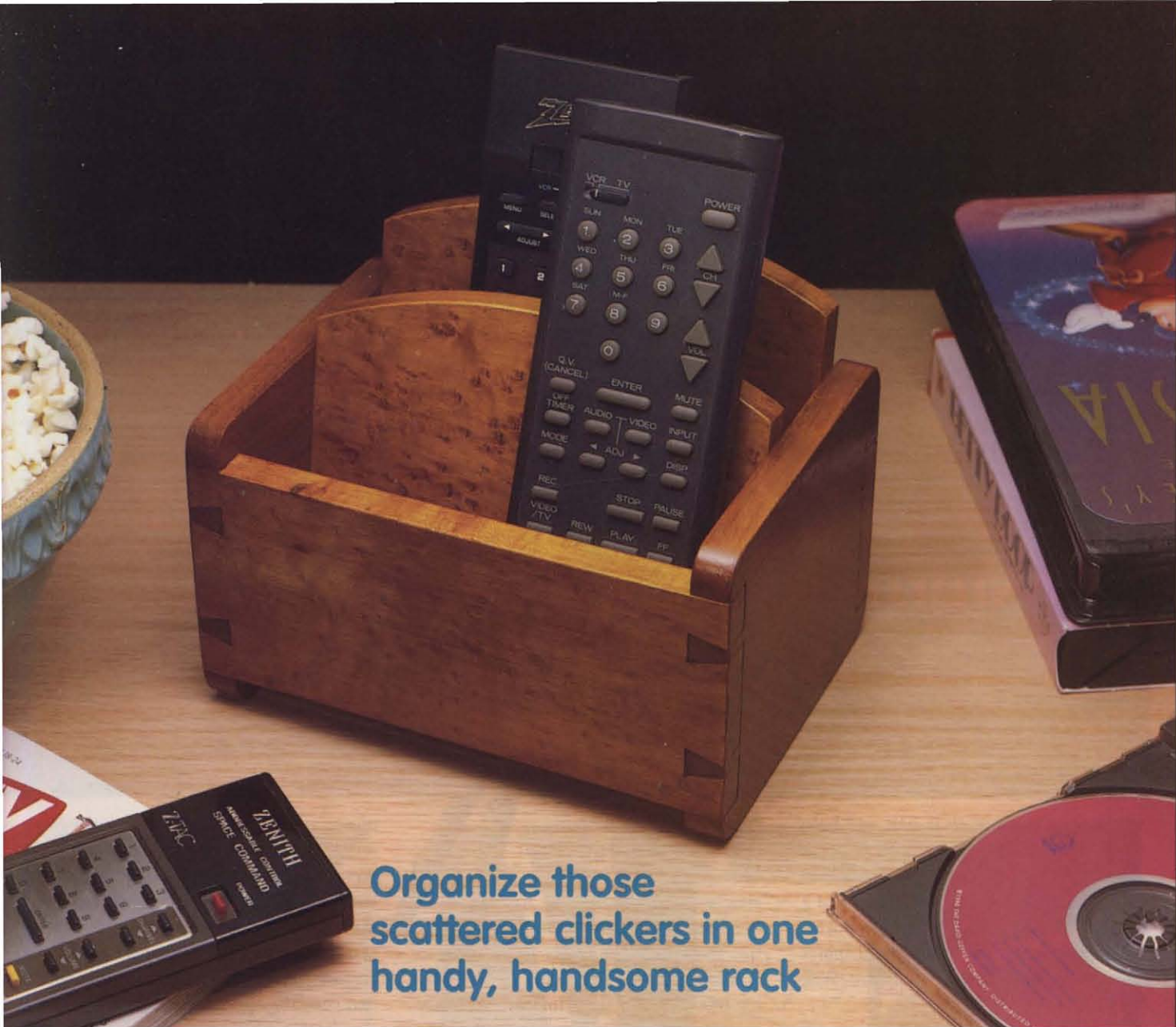
For a finish we applied two coats of Minwax's Colonial Maple Wood Finish followed by a couple of coats of good penetrating oil. 

**Bill of Materials**  
(all dimensions actual)

| Part                     | Description    | Size              | No. Req'd. |
|--------------------------|----------------|-------------------|------------|
| A                        | Front/Back     | 1/2 x 3 x 7       | 2          |
| B                        | End            | 1/2 x 4 x 5       | 2          |
| C                        | Bottom         | 1/2 x 4 x 6 1/4 * | 1          |
| D                        | Wide Divider   | 1/2 x 4 3/4 x 6   | 1          |
| E                        | Narrow Divider | 1/2 x 4 1/4 x 6   | 1          |
| * Length includes tenons |                |                   |            |









## Western-Style Belt Buckle & Bolo Set

**F**ancy western-style belt and bolo sets such as ours typically sell for hundreds of dollars, but you can make this great-looking combo for just a fraction of that cost. To simplify locating all the parts that you'll need, parts kits are available (see What You Will Need).

The set shown is by Connecticut woodworker David Moretti. Frustrated by the cost of similar items, Dave drew up these handsome designs and made them himself. Both the eagle face on the belt buckle and the steer skull on the bolo are combinations of mother-of-pearl and abalone inlays. Mother-of-pearl and abalone blanks, plus all the hardware that you need are in the kits. The only thing that you must supply is the wood.

The inlay process used here is nearly identical to that used for the mother-of-pearl inlay in the Hand Mirror in our November/December 1990 issue. In addition to the inlay materials and the wood you'll need a Dremel Moto-Tool (or any similar product) and the router base attachment (see photo). You can of course also cut out the inlay recess by hand, with knives and chisels, as it was done traditionally and still is done in

most undeveloped countries. But we've tried the Moto-Tool and router base attachment method here in our shop, and it really simplifies and speeds the work.

Inlay work isn't difficult. People who try inlay for the first time are typically surprised at how easy and rewarding the process is. With a full-size pattern to work with, the work involves just a few basic steps: Transferring the pattern to the inlay blanks, cutting the inlays, tracing the inlay profile onto the stock into which it will be set (called the ground), routing the recess, gluing the inlay in place, and then sanding smooth and finishing. Before starting work, please read our Safety section (page 48).

### Step-By-Step

*Note that although our step-by-step illustrations show the belt buckle, the bolo inlay process is identical. Your belt buckle kit will include three pieces of inlay material, two mother-of-pearl blanks for the head and an abalone blank for the beak and eye parts.*

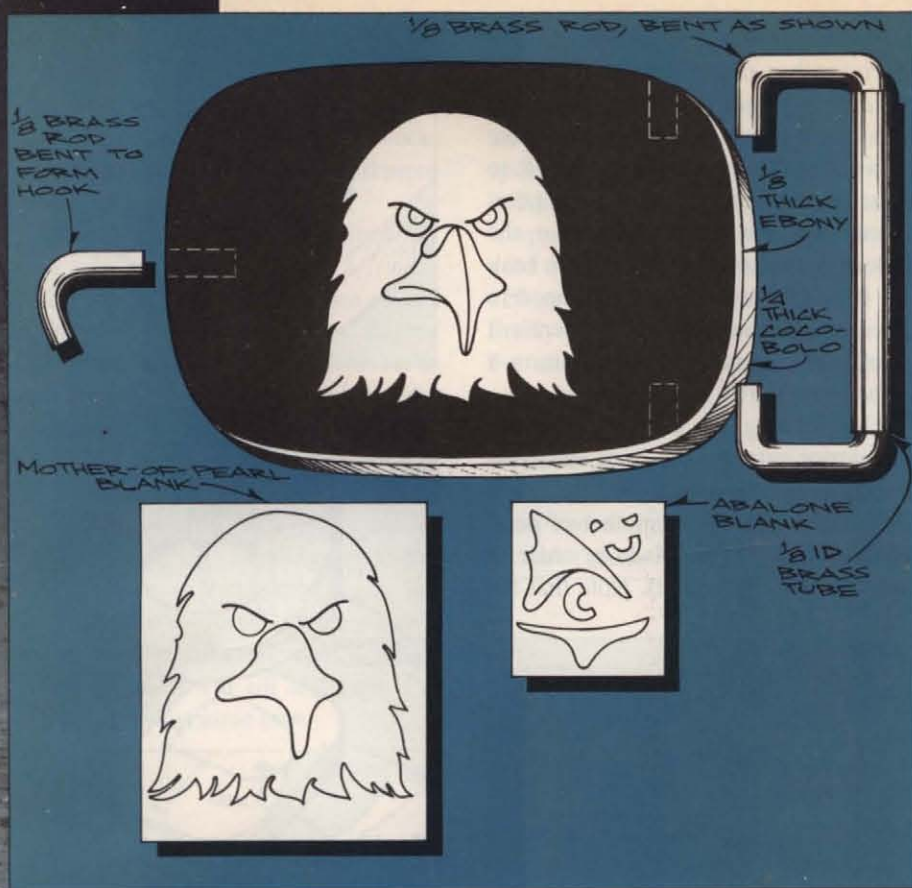
*Mother-of-pearl is typically sold in random sizes, so it's difficult to make assurances as to the exact sizes of the*

*pieces you receive. Our kit includes two pieces of pearl, so if necessary, the two pieces can be edge-jointed and butted to yield a single larger piece, sufficient for the eagle head. Edge-jointing is easy—just place a sheet of sandpaper on a flat surface (a section of plate glass is ideal) and sand the edges to be butted. If one of the mother-of-pearl pieces is close to (only 1/4 in. or so smaller than) the full-size pattern, you may want to consider using it and slightly narrowing the width of the eagle head to fit the pearl blank. Since the outside profile is just a random, jagged edge indicating feathers, the overall look won't be affected by a slight downsizing.*

*The bolo kit will include a large section of mother-of-pearl for the skull parts and a smaller section of abalone for the horns.*

As illustrated here, the wooden buckle and bolo laminations are made and final sized before the inlay work is done. You could make the inlays in an oversized wooden "ground" lamination, and then cut the buckle and bolo to final size after the inlays are complete, but that would waste quite a bit of wood. Since the wood we used is somewhat precious (we used laminations of ebony over coco-

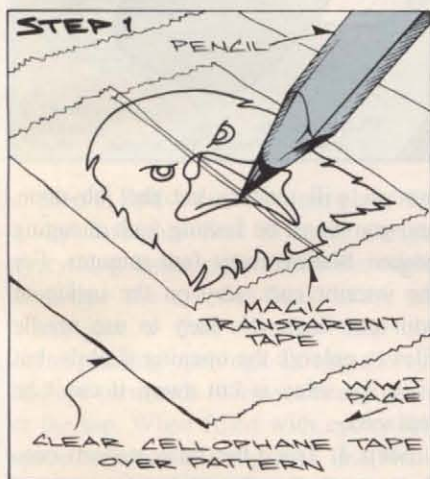




clear cellophane tape. You can use standard  $\frac{3}{4}$  in. wide household tape, but by using wide packing tape, there won't be any seams. Now place a piece of Scotch Magic Tape over the cellophane tape, and using a sharp pencil, trace the pattern. The Magic Tape surface easily accepts a pencil line. We found that 1 in. wide Scotch Magic Tape will cover all of the steer skull and the eagle's individual parts, except for the eagle head itself. You'll need to butt two pieces of the tape edge-to-edge to transfer the profile of the eagle head to its pearl blank.

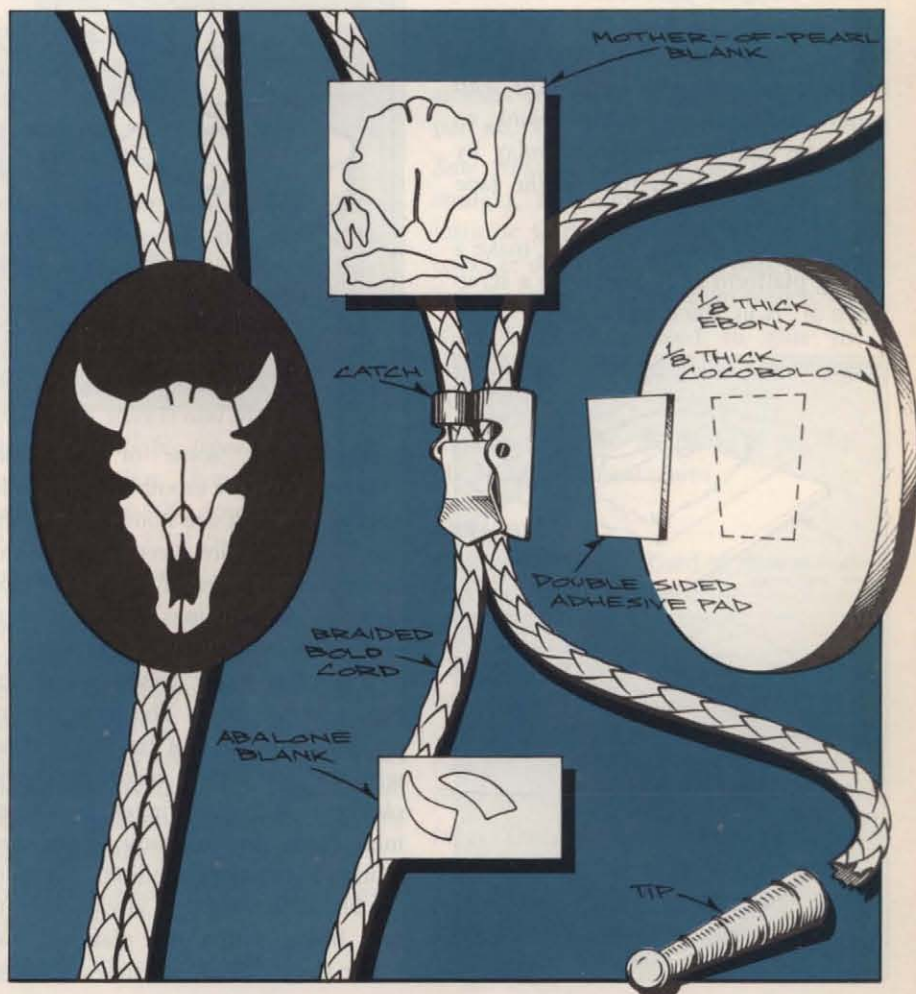
**Step 2.** Locate the patterns on the inlay blanks. The eagle head is transferred to the mother-of-pearl; the beak and eye parts are transferred to the abalone. If you are using two pieces of pearl for the eagle head, align the two pieces of Magic Tape with the jointed edges of the two pearl sections, so the halves of the pattern register properly.

Don't use a single piece of Magic Tape to transfer the three beak parts and four eye parts at the same time. Instead, use a separate piece of tape for each different part of the pattern. If you study the photo closely, you'll note that the



bolo) our method of using a holding block to secure the part while the inlay recess is routed minimizes waste. Make the wooden belt buckle and bolo as shown, using  $\frac{1}{8}$  in. thick ebony for both, laminated over  $\frac{1}{8}$  in. thick cocobolo for the bolo and over  $\frac{1}{4}$  in. thick cocobolo for the buckle.

**Step 1.** Transfer the full-size inlay pattern. There are several ways to do this (see What You Will Need for several options), but our method protects the original while making it easy to transfer the pattern as many times as you want. First tape over the original pattern with





## Safety

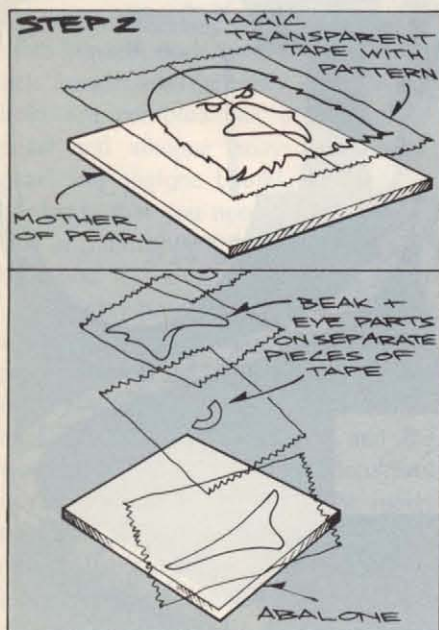
Inhaling shell dust over a period of time (chronic exposure) is hazardous to your health. If you don't have the means to eliminate the pearl dust from your shop, wear a respirator. Making one inlay will not damage your lungs, but even a single exposure can be irritating to some people.



two sides of the beak are cut from slightly different hues of abalone, as are the eyes and eye surrounds. Your abalone blank should include a variety of patterns and hues. Test the Magic Tape with pattern parts on various sections of the blank to obtain the best contrast, before cutting the parts out.

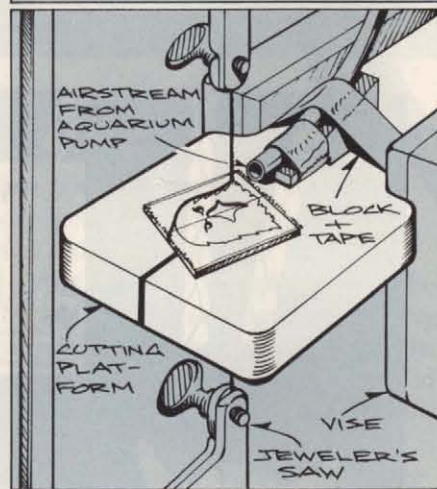
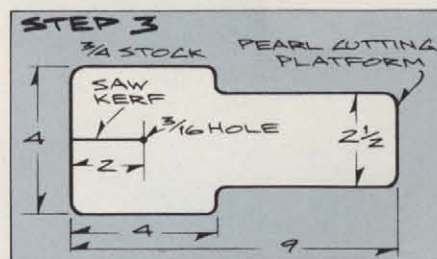
**Step 3.** Cut the parts from the inlay blanks (make sure to wear your respirator). Remember, your Magic Tape with pattern is directly on the inlay blank, so you'll be cutting through the inlay by following the pattern line on the tape affixed to it.

If you don't already have one, make a cutting platform as shown, from a scrap piece of  $\frac{3}{4}$  in. thick board or plywood.



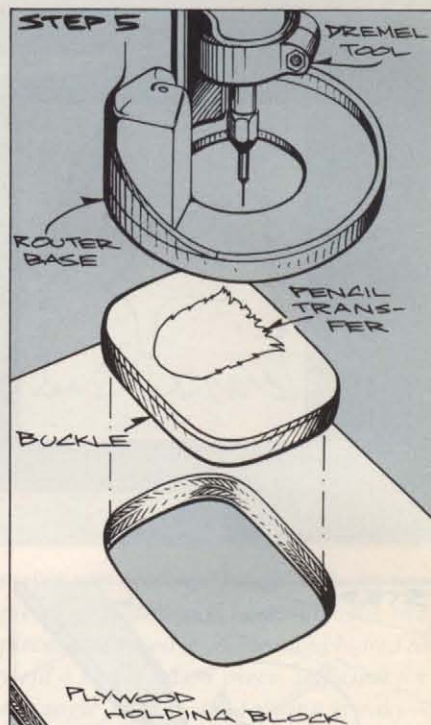
An aquarium pump located on your bench, with a plastic line taped to the platform, will provide an airstream to keep the cutting area clear of dust. Note the wooden block under the hose end, to direct the airstream down onto the point of cut. For the belt buckle, cut the abalone parts first, then test fit the beak and eye parts over the pattern taped to the mother-of-pearl blank. If there's a serious discrepancy, consider cutting a replacement part.

When cutting the eagle head, make the interior cuts (for the beak and eyes) first, then cut the outside profile. You'll need to drill through the mother-of-pearl for the jeweler's saw blade in order to make the interior cutouts. Note that the



eyebrow ends, some of the feather detailing, and the mouth line in the left side of the beak are nothing more than cut lines that are later filled with a contrasting mixture of epoxy and wood dust. Similar cut lines add detail to the skull inlay on the bolo.

If you've never tried to cut shell before, don't panic. The teeth on your jeweler's saw should be facing down, with the saw handle below the cutting platform. With your fingers holding the inlay blank, use a steady up-and-down motion to cut along the lines, advancing the blank as needed to always keep the saw blade within the platform hole. Never force the saw. A slow and steady



motion will quickly get the job done, and you won't be fussing with changing broken blades every few minutes. For the interior cuts, stay on the inside of your cut lines; it's easy to use needle files to enlarge the opening slightly, but once the inlay is cut away, it can't be replaced.

**Step 4.** Trace the inlay pattern onto the ground. For the eagle, just position your mother-of-pearl eagle head on the buckle, then trace the outside profile. A pencil line won't read easily on a black wood like ebony, so we used a white China Marker, by Berol, available at most stationary stores. For the bolo, locate the parts one at a time and trace around them. A cotton swab comes in handy for holding down small parts while tracing around them. Note that a center section of wood remains in the steer skull inlay.

**Step 5.** Rout the inlay recesses. We show a plywood holding block to anchor the wood and provide a level surface for



the router base attachment. You'll need a  $\frac{3}{8}$  in. thick piece of plywood for the buckle holding block and a  $\frac{1}{4}$  in. piece of plywood for the bolo holding block. Tape across the back of the workpiece and holding block.

Mount the base to the Moto-Tool. We used a  $\frac{1}{8}$  in. collet to chuck a  $\frac{1}{16}$  in. solid carbide inlay bit, and then routed out most of the interior section, staying just off the line. The bit depth was set to leave the inlay standing just proud of the surrounding surface. If sawdust builds up, direct the air stream from the cooling fan blades toward the work area to clear it. We then switched to a  $\frac{1}{32}$  in. bit for the final detailing, cleaning up to the line. It helps to frequently check the actual inlay to the recess. Don't worry if you're a little off—the epoxy mixed with wood dust will fill any gaps. Put some of this dust aside now.



**Step 6.** Epoxy the inlay into place. Do a dry assembly first to make certain everything looks right. With the eagle, note how the eye and beak inlays are sized just a little smaller than the corresponding openings. Locate the eye and eye surrounds to leave a heavy space at the top. When filled with epoxy this space becomes a strong dark line forming the eyebrow. Use files to final adjust any inlay sizes so your piece looks like that in the photo.

Now mix up some 5-minute epoxy with the ebony dust that you put aside earlier. Spread a generous layer of the epoxy-and-dust mixture in the inlay recess, press the eagle inlay parts into place, the mother-of-pearl first, then the eye and beak sections. Work quickly; the epoxy sets up fast. Make sure the inlays bottom out and are all level, but don't worry about epoxy squeeze out now—that will be sanded off later. If you've used two pieces of mother-of-pearl for the head, make sure the joint

line where the pieces meet is tight, with no gaps. One way to insure a tight joint is to tape the two pieces together along the joint line before bedding them in the epoxy (the tape is later removed).

Sand smooth. A block of wood wrapped with varying sandpaper grits is used to sand the inlay smooth. Start with 120 grit, then switch to 220, 320 and finally a 400-grit wet-or-dry sandpaper. For an even higher sheen, try using a polishing compound.

## Details

Your belt buckle kit includes lengths of brass rod and tubing. Nip off a short section (about  $\frac{3}{4}$  in.) of the rod, then

bend it as shown to serve as a hook to catch the holes in your belt. Cut the tubing to  $1\frac{3}{4}$  in. long, slip the tubing onto the remaining rod, then bend the rod ends as shown to fit within a pair of  $\frac{1}{8}$  in. diameter by  $\frac{3}{8}$  in. deep holes drilled into the buckle sides. The hook section of the rod is epoxied into a  $\frac{1}{8}$  in. diameter by  $\frac{3}{8}$  in. deep hole in the buckle end.

The bolo kit includes the braided bolo cord, a pair of tips, a catch and a section of double-sided adhesive pad. Fasten the catch to the bolo back with the double-sided adhesive pad, thread the cord through the catch, then epoxy the tips to the cord.



## What You Will Need

*Parts kits are available from Aspen Kits, 6 Hilltop Drive, Old Saybrook, CT 06475; tel. (203) 388-6179. Check or money order only; specify Buckle or Bolo kit, or both. Kits do not include wood. If you'd like only the hardware (no mother-of-pearl or abalone), we've listed the hardware prices separately. Contrasting woods also make a handsome inlay material.*

### Buckle Kit

Includes mother-of-pearl and abalone blanks, brass rod and tube. Cost is \$30 postpaid. Hardware only is \$4 postpaid.

### Bolo Kit

Includes mother-of-pearl and abalone blanks, bolo cord, tips, catch, and adhesive pad. Cost is \$25 postpaid. Hardware only is \$10 postpaid.

*Tools listed, except for the aquarium pump (available from pet supply and department stores) and the cutting platform, are available from: Stewart MacDonald's Guitar Shop Supply, 21 N. Shafer St., Box 900, Athens, OH 45701; tel. 1-800-848-2273 (specify part numbers when ordering.)*

### Tools

**Dremel Deluxe Moto-Tool Kit:** The kit includes the top-of-the-line 5-speed Moto-Tool plus a 40-piece accessory kit, all in a polyethylene carrying case. The kit also includes  $\frac{1}{8}$  in. and  $\frac{3}{32}$  in. collets, which are needed to hold the inlay bits. Order part no. 395.

**Dremel Moto-Tool Router Base:** Order part no. 566.

**Cutting Platform:** You make it.

**Solid Carbide Downcut Inlay Bits:** The Deluxe Moto-Tool kit includes several high-speed steel inlay cutters, but we found that the solid carbide bits not only last longer but also leave a clean, no-fuzz edge on the routed recess. We used two bits, a  $\frac{1}{16}$  in. and a  $\frac{1}{32}$  in. Both bits have  $\frac{1}{8}$  in. shanks, so you'll need to use the  $\frac{1}{8}$  in. collet. Order part no. 38 for the  $\frac{1}{32}$  in. bit and part no. 40 for the  $\frac{1}{16}$  in. bit.

**Jeweler's Saw:** The adjustable frame enables you to set blade tension. Order part no. 664.

**Saw Blades:** Use medium blades for straight, fast cutting; fine blades for intricate work. Order part no. 662 for a package of 12 fine blades; part no. 663 for a package of 12 medium blades.

**Kwik-Set Epoxy:** Used to glue the abalone and pearl in place. Order part no. 627.

**Aquarium Pump:** Available at pet supply and department stores.

### Optional

**Cutting Lubricant:** Used to reduce friction and therefore extend the life of saw blades. Order part no. 1671.

**Pattern Tracing Stylus:** This is a mini ball stylus that enables you to use carbon paper as a means to transfer patterns directly from the original to the pearl stock. Order part no. 1673.

**Inlay Tracing Scribe:** This fine-point scribe will make a finer line than a pencil when you're tracing the pearl outline onto your ground. Order part no. 1672.



# Chest/Cupboard

*Cherry-on-black finish highlights this versatile storage solution*



**M**atching the look of natural wood against wood that's painted black has become very popular with furniture designers of late. After making this piece we can understand why. The combination is very striking, and it works well in both traditional and contemporary settings.

## Selecting Stock

Since much of the chest is painted, there is no need to use solid stock for all the case parts. We used  $\frac{3}{4}$  in. birch plywood for the two sides, the divider, the bottom, the fixed shelf and the two adjustable shelves. An edging is added to hide the exposed front edges of the plywood. Plywood saves cost and eliminates the need to glue-up stock. It also eliminates the inherent wood movement problems associated with solid stock.

We also used plywood for a few other parts— $\frac{1}{4}$  in. birch plywood for the two back panels and the six drawer bottoms, and  $\frac{1}{4}$  in. cherry plywood for the door panel.

Solid cherry was used for the drawer fronts, door stiles and rails, knobs, base molding, and top. All the remaining parts can't be seen, so we used poplar as a further cost saving measure.

## Prepare the Case Parts

It will be important for the assembled case to be square, so you'd better check your table saw rip fence and miter gauge before starting. The few minutes spent checking the saw may save you time in the long run.

Begin by cutting the two sides (A), the divider (B), the bottom (C), the two stretchers (D) and the fixed shelf (E) to the length and width dimensions shown in the Bill Of Materials. The plywood parts are less likely to splinter if you use a plywood cutting blade.

Next, lay out the locations of the various dadoes and rabbets that will be cut in the sides, divider, bottom and stretchers. Note that each side will have a  $\frac{1}{4}$  in. deep by  $\frac{3}{4}$  in. wide dado to accept the bottom, a  $\frac{1}{2}$  in. deep by  $\frac{3}{4}$  in. wide rabbet to accept the back frame, and a pair of  $\frac{1}{4}$  in. deep by  $\frac{3}{8}$  in. wide grooves to accept the stretchers (D). Also, the right side will have a  $\frac{1}{4}$  in. deep by  $\frac{3}{4}$  in. wide dado to accept the fixed shelf (E).

The divider will have a  $\frac{3}{4}$  in. deep by  $2\frac{1}{2}$  in. long notch for the front stretcher and a  $\frac{3}{4}$  in. deep by  $3\frac{1}{4}$  in. long notch for the back stretcher. Also, the right side of the divider will have a  $\frac{1}{4}$  in. deep by  $\frac{3}{4}$  in. wide dado for the fixed shelf.

The bottom will have a  $\frac{1}{4}$  in. deep by  $\frac{3}{4}$  in. wide dado to accept the divider and a  $\frac{1}{2}$  in. deep by  $\frac{3}{4}$  in. wide rabbet for the back frame.

As shown in the Fig. 1, the stretchers have  $\frac{3}{8}$  in. deep by  $\frac{1}{4}$  in. long tenons on each end. Note that the tenons on the front stretcher are notched to fit around the edging.

Cut all the  $\frac{1}{2}$  in. deep by  $\frac{3}{4}$  in. wide rabbets first, using the table saw and a dado head cutter. Also use the table saw and dado head to cut the stretcher tenons. The notches in the divider are cut with a hand-held jigsaw.

Use the router to cut the  $\frac{1}{4}$  in. deep by  $\frac{3}{4}$  in. wide through dadoes and the  $\frac{1}{4}$  in.

deep by  $\frac{3}{8}$  in. wide grooves. You'll need to clamp a straightedge to the stock in order to guide the router, just be sure that the straightedge is square to the edges.

Next, lay out and drill the  $\frac{1}{4}$  in. diameter by  $\frac{3}{8}$  in. deep holes for the adjustable shelves. Rather than add holes the entire length of the divider and side, we drilled five groups of three, spacing them evenly apart. Start the holes at least 6 in. from the bottom and the top to avoid the hinges which will be added later. Finally, use a jigsaw to make the cutouts at the bottom of the sides.

## Add the Edging

The  $\frac{3}{4}$  in. by  $\frac{3}{4}$  in. edging (G) serves to cover the exposed plywood edges on the front of the two sides, the divider, and the fixed shelf. It is secured with several countersunk finishing nails, then the countersunk holes are filled and sanded smooth. To insure a good joint, we cut the edging  $\frac{7}{8}$  in. wide. This allowed a little overhang on each side of the plywood when the edging was attached. When the glue joint dried, we used a laminate trimmer with a flush trimming bit (a router can also be used) to trim the overhang flush with the edges. Keep in mind, however, that the trimming bit won't have a bearing surface at the dadoes and grooves. Skip over those short sections and sand them later by hand. Next, cut the gentle curve in the fixed shelf edging.

## Assemble the Case

The sides, divider, bottom, stretchers and fixed shelf can now be assembled. Use glue and countersunk wood screws to join the divider to the fixed shelf. Then, in the same manner, add the bottom and the right side. Complete the case assembly by adding the stretchers and the left side. The stretchers are glued in place. To help support the divider, drive a couple of screws through the top



of each stretcher and into the divider notches.\*

Note that the bottom and the fixed shelf are set back  $\frac{3}{4}$  in. from the front. All the other case parts should be flush at the front.

The case must be square in order for the drawers and door to fit well later, so you'll want to check everything carefully before setting it aside to dry. Once dry, use wood plugs to fill the countersunk holes, then sand them smooth.

### Make the Back Frame

Cut the two side stiles (P), the center stile (Q) and two rails (R) to size. Use the table saw and dado head to cut the  $\frac{1}{4}$  in. wide by  $\frac{1}{2}$  in. deep panel grooves in each part. Also cut the  $\frac{1}{4}$  in. wide by  $\frac{1}{2}$  in. long tenons on each of the frame rails and the center stile.

Next, cut the two back panels (S) to size. Once the panels are cut, assemble the frame as shown. Make sure the assembled frame is square. If it isn't, the case won't be square when the back is attached.

Now join the back to the case. Use flat head wood screws, driving the screws through the frame and into the rabbet in the back of the case. No glue is needed. Also drive a few screws into the back edge of the divider.

### Add the Base Parts

Cut the spacer (H) to fit snugly between the sides. In order for the spacer to fit, you'll need to trim  $\frac{1}{4}$  in. from the bottom edge of the divider edging. Some work with a dovetail saw and chisel will do the job in short order. Use glue along with some countersunk and filled finishing nails to secure the spacer in place.

The base sides (I) and front (J) can now be cut to size and mitered at the corners. Lay out the curves as shown, then cut them to shape with a band saw or jig saw. Sand the rough sawn edges, then join the parts to the case. Use glue

along with several screws driven through the inside of the case.

Now, cut the back feet (T) to size and glue them in place. We added four  $\frac{3}{4}$  in. by  $\frac{3}{4}$  in. glueblocks (L) to further support the base parts.

### Make the Drawers

As shown in the front view of the drawing, the front of the case measures  $45\frac{7}{8}$  in., which allows the  $7\frac{1}{2}$  in. wide drawers to fit with  $\frac{1}{8}$  in. in between each one. Before cutting your drawer stock, be sure to measure the actual opening of your case and adjust the drawer height as needed to get the  $\frac{1}{8}$  in. spacing.

Once the exact dimensions are worked out, cut all the drawer fronts (U),

backs (V), and sides (W) to size. Use the router table to cut the  $\frac{3}{4}$  in. wide by  $\frac{1}{4}$  in. deep runner groove in each side. Note that the groove is stopped  $\frac{3}{4}$  in. from the front edge of the side. A chisel is used to square the rounded corner.

Use the table saw and dado head to cut the various grooves and dados, then dry assemble the parts. Cut the bottom (X) for a good fit in the grooves.

Assemble the drawers as shown. Use glue and clamp securely. The bottom isn't glued in place. Instead it's held in place with three wood screws driven into the bottom edge of the back. Like the case made earlier, the drawers must be square.

The knobs (CC) can be ordered from





Woodcraft (see Bill of Materials). Use glue to secure them in place.

### Add the Drawers

Next, cut the 12 runners (M) to size. You'll want them to have a smooth sliding fit in the drawer side grooves. Drill and countersink a hole about 1 in. from each end to accept  $\frac{3}{4}$  in. by no. 6 flathead wood screws.

Begin by mounting the third drawer

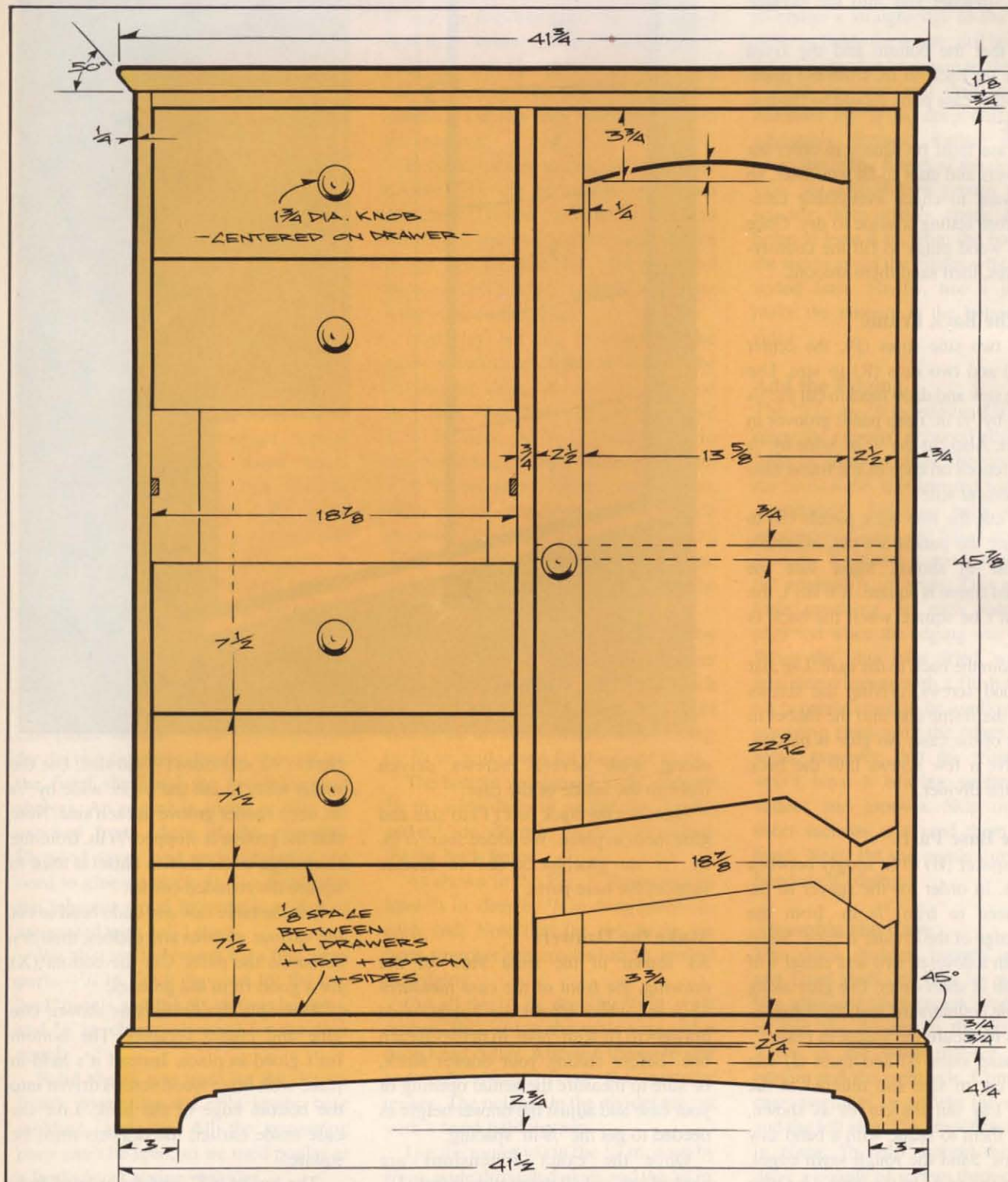
down from the top. At a point  $18\frac{3}{4}$  in. from the bottom of the stretcher (see side view), mark the location of both the left and right runners, then use a framing square (holding one leg of the square against the front edge of the divider or side) to scribe a line from front to back.

Use the  $\frac{3}{4}$  in. by no. 6 wood screws to mount the runners, making sure the top edge of the runners are flush with the scribed line. Also, make sure the front

edge of the runner is located 1 in. from the front edge of the case.

Once the two runners are mounted, check the drawer for a good sliding fit. If the thickness or width needs to be reduced, remove the runner and use a hand plane to shave a little bit off at a time until you are satisfied.

Next, following the same procedure, mount the third drawer from the bottom. When that one fits well, add the second





drawer from the bottom, and finally the bottom drawer. Complete the drawer installation by mounting the second drawer from the top and then the top drawer. By starting with the middle drawers of the case and working towards the top and bottom, you will minimize any accumulation of error as you space the drawers.

At this point the drawers should have a  $\frac{1}{8}$  in. spacing between each one.

However, if the top and bottom drawers appear too tight against the case, use your hand plane to narrow the drawer a bit as needed.

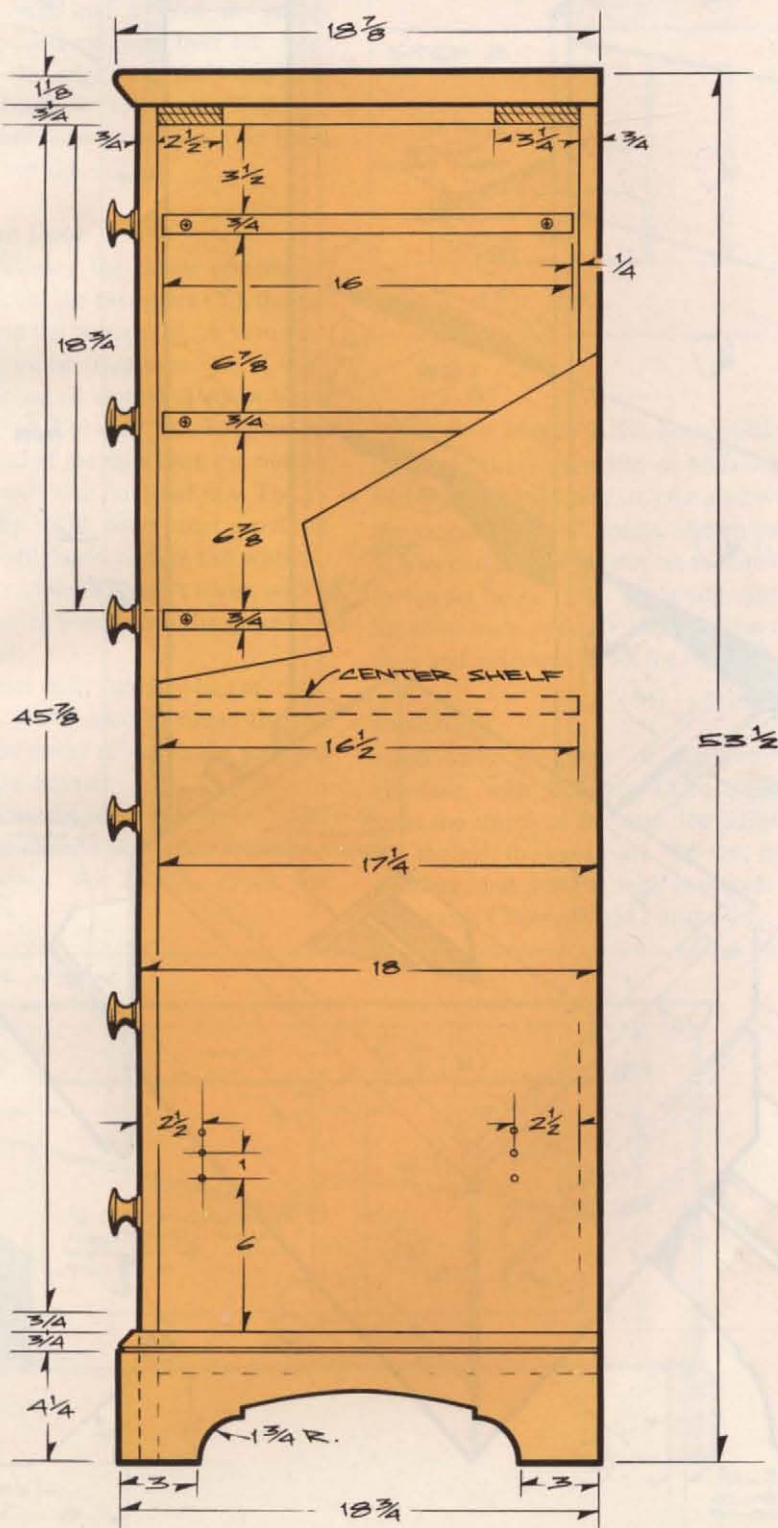
### Make the Shelves, Base Molding and Top

Cut the two adjustable shelves (F) to size and add the edging to the front. Scribe the  $\frac{1}{2}$  in. deep decorative curve in the edging, then use the band saw to cut it

out. Make eight shelf support pegs by cutting  $\frac{1}{4}$  in. diameter dowel stock to  $\frac{3}{4}$  in. lengths.

You'll need a 4 foot length of  $\frac{3}{4}$  in. thick by  $2\frac{1}{4}$  in. wide cherry to make the base molding (K). As shown in Fig. 2, the base molding is made in four steps on the table saw. The rounded "nose" is made (after completing Step 2) simply by hand sanding the edge as shown.

Next, cut the top (N) to final size, then



### Bill of Materials

(all dimensions actual)

| Part                          | Description       | Size                                                            | No. Req'd. |
|-------------------------------|-------------------|-----------------------------------------------------------------|------------|
| <b>Case</b>                   |                   |                                                                 |            |
| A                             | Side              | $\frac{3}{4}$ x $17\frac{1}{4}$ x $53\frac{1}{2}$               | 2          |
| B                             | Divider           | $\frac{3}{4}$ x $16\frac{1}{2}$ x $46\frac{7}{8}$               | 1          |
| C                             | Bottom            | $\frac{3}{4}$ x $17\frac{1}{4}$ x 39                            | 1          |
| D                             | Stretcher         | $\frac{3}{4}$ x $3\frac{1}{4}$ x 39 <sup>(1)</sup>              | 2          |
| E                             | Fixed Shelf       | $\frac{3}{4}$ x $15\frac{3}{4}$ x $19\frac{3}{8}$               | 1          |
| F                             | Adjustable Shelf  | $\frac{3}{4}$ x $15\frac{1}{2}$ x $18\frac{5}{8}$               | 2          |
| G                             | Edging            | $\frac{3}{4}$ x $\frac{7}{8}$ <sup>(2)</sup>                    | 22 ft.     |
| H                             | Spacer            | $\frac{3}{4}$ x $2\frac{1}{4}$ x $38\frac{1}{2}$                | 1          |
| I                             | Base Side         | $\frac{3}{4}$ x $4\frac{1}{4}$ x $18\frac{3}{4}$                | 2          |
| J                             | Base Front        | $\frac{3}{4}$ x $4\frac{1}{4}$ x $41\frac{1}{2}$                | 1          |
| K                             | Base Molding      | (see detail)                                                    | 7 ft.      |
| L                             | Glueblock         | $\frac{3}{4}$ x $\frac{3}{4}$                                   | 4          |
| M                             | Runner            | $\frac{3}{8}$ x $\frac{3}{4}$ x 16                              | 12         |
| N                             | Top               | $1\frac{1}{8}$ x $18\frac{7}{8}$ x $41\frac{3}{4}$              | 1          |
| O                             | Cleat             | $\frac{3}{4}$ x $\frac{3}{4}$ x 2                               | 3          |
| P                             | Back Side Stile   | $\frac{3}{4}$ x 3 x $47\frac{1}{8}$                             | 2          |
| Q                             | Back Center Stile | $\frac{3}{4}$ x 3 x $42\frac{1}{8}$ <sup>(3)</sup>              | 1          |
| R                             | Back Rail         | $\frac{3}{4}$ x 3 x $34\frac{1}{2}$ <sup>(3)</sup>              | 2          |
| S                             | Back Panel        | $\frac{1}{4}$ x $16\frac{1}{8}$ x 42 <sup>(4)</sup>             | 2          |
| T                             | Back Foot         | $\frac{3}{4}$ x 5 x 8                                           | 2          |
| <b>Drawer<sup>(5)</sup></b>   |                   |                                                                 |            |
| U                             | Front             | $\frac{3}{4}$ x $7\frac{1}{2}$ x $18\frac{5}{8}$                | 1          |
| V                             | Back              | $\frac{1}{2}$ x 7 x $18\frac{1}{8}$                             | 1          |
| W                             | Side              | $\frac{1}{2}$ x $7\frac{1}{2}$ x $16\frac{3}{4}$                | 2          |
| X                             | Bottom            | $\frac{1}{4}$ x $16\frac{1}{2}$ x $18\frac{1}{8}$               | 1          |
| <b>Door</b>                   |                   |                                                                 |            |
| Y                             | Stile             | $\frac{3}{4}$ x $2\frac{1}{2}$ x $45\frac{5}{8}$                | 2          |
| Z                             | Top Rail          | $\frac{3}{4}$ x $3\frac{3}{4}$ x $14\frac{5}{8}$ <sup>(3)</sup> | 1          |
| AA                            | Bottom Rail       | $\frac{3}{4}$ x $3\frac{3}{4}$ x $14\frac{5}{8}$ <sup>(3)</sup> | 1          |
| BB                            | Panel             | $\frac{1}{4}$ x $14\frac{1}{2}$ x 40 <sup>(4)</sup>             | 1          |
| <b>Hardware<sup>(6)</sup></b> |                   |                                                                 |            |
| CC                            | Knob              | $1\frac{3}{4}$ in. dia.                                         | 7          |
| DD                            | Hinge             | European inset                                                  | 2          |
| EE                            | Felt Disk         | $\frac{3}{8}$ in. dia.                                          | 1          |

(1) Length includes rabbets.

(2) Width dimension allows extra for trimming

(3) Length includes tenon(s).

(4) Length and width dimensions allow  $\frac{1}{8}$  in. space in frame.

(5) Quantities shown are for one drawer.

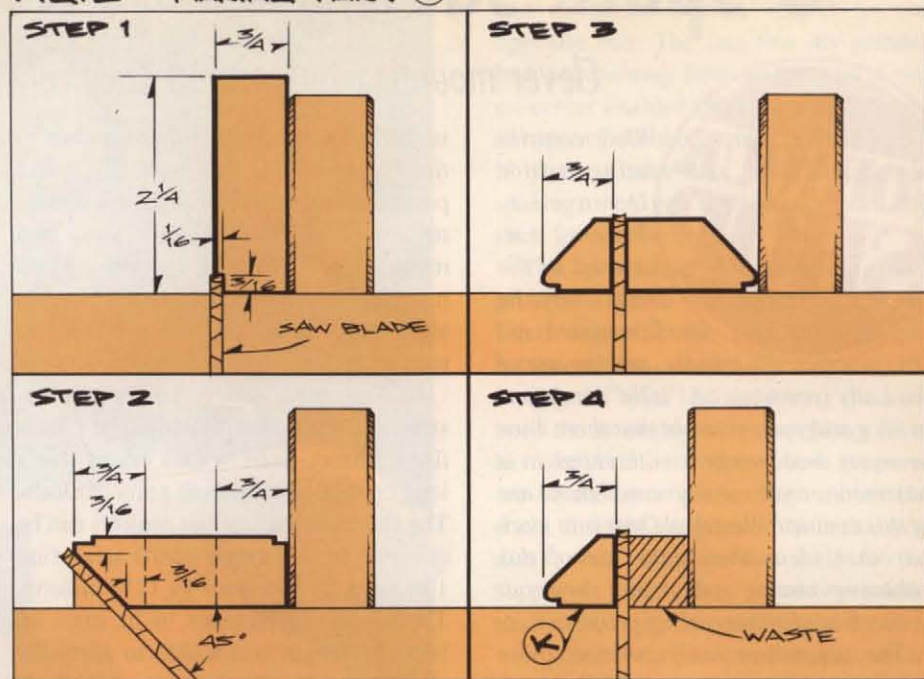
(6) Available from Woodcraft, 210 Wood County Industrial Park, Parkersburg, WV 26102-1686; tel. 1-800-225-1153. For a bag of 10 cherry knobs ( $1\frac{3}{4}$  in. dia.) order part no. 50R51 (\$8.95 per bag); for a pair of inset European clip hinges order part no. 02S70 (\$14.95 per pair); for a roll of  $\frac{3}{8}$  in. dia. adhesive-backed felt disks (48 per roll) order part no. 04A10 (\$2.50 per roll).







FIG. 2 MAKING PART (K)



round the top edge of the front and sides with a router and a 3/16 in. radius bearing-guided rounding over bit. After rounding the edge, use the table saw, with the blade set to cut the 50-degree angle shown (see front view), to bevel the front and side edges.

### Make the Door

After measuring the actual opening of your case, cut the two stiles (Y), the top rail (Z), and the bottom rail (AA) to size. As shown in the front view, you'll want a 1/8 in. space all around the door when it is installed. Cut the 1/2 in. long tenons on each end of the rails, then cut out the top rail curve with the band saw. The 1/4 in. wide by 1/2 in. deep panel groove is cut in the stiles and bottom rail with the table saw and dado head. A router with a wing cutter is used to cut the groove in the top rail.

The panel (BB) can now be cut to fit. Note that you'll need to round the top edge of the panel to match the rounded curve in the top rail.

Assemble the door as shown. Use glue at the mortise and tenon joints and clamp firmly. As always, check for squareness.

The door hinges (DD) are available from Woodcraft (see Bill of Materials). Mounting instructions are provided with the hinges. You will need a 35 mm (or a 1 3/8 in.) diameter Forstner bit to bore the mounting holes. After mounting, check the door for a good fit, then remove the door and hinges to allow for finishing.

### Finishing

Final sand all parts of the project, finishing with 220-grit. Once sanded, stain the inside of the case, the adjustable shelves, the case back, the top, base molding, and drawers with two coats of Minwax's Cherry Wood Finish.

When dry, add two coats of amber shellac to the stained surfaces, followed by one coat of McCloskey's Heirloom Satin (or eggshell) varnish.

The black paint is added next. Use a satin, black, latex paint—you should be able to find a good one at any paint store. We brushed on two coats, choosing not to use a primer.

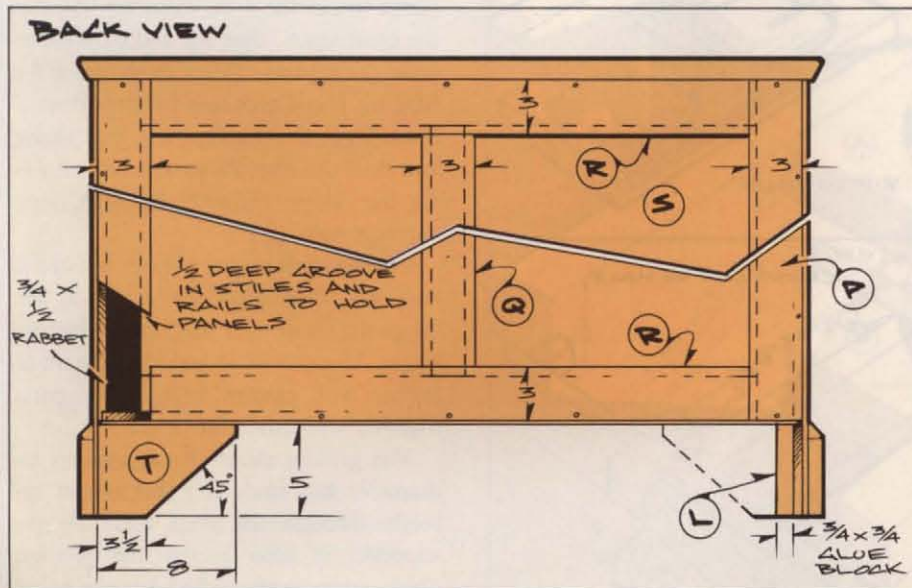
Paint the outside of the sides, the base sides and front, and the spacer. Also paint the front edges of the sides, the top stretcher and the divider.

When painting the edges, it's a good idea to extend the paint about 3/4 in. into case. If this area is not painted, it will show as an unsightly light border after the door and drawers are installed. Some masking tape will help here to establish the paint lines. Also, add a dab of paint to the front of each drawer runner.

Avoid getting paint in the areas where the base molding will be glued in place. The glue won't adhere well to paint.

### Final Details

Miter the base molding at the corners, then glue it in place. Glue the three cleats (O) to the case and attach the top with wood screws driven up through the cleats and stretchers. Finally, add the drawers, remount the door, and apply the felt disk (EE). A thin coat of beeswax applied to the runners will help the drawers slide easier.





# 3 Space-saving Projects for the Shop

*Clever mounting system puts Lally columns to work*

by Dennis Preston

**FOR YOUR SHOP**

When contributing editor *Dennis Preston* showed us the clever way he had mounted his

grinder, making use of the Lally (pronounced "lolly") columns in his garage, we thought that there must be many woodworkers with shops in a basement or garage who could make use of this concept. We asked Dennis to work on other ideas that make use of this column-mounting system, and the result is this trio of space-saving projects.

The ubiquitous Lally column (those tubular steel posts, usually filled with concrete) is found everywhere that a strong support is needed—in garages and basements, but also in barns and inside homes. The columns are typically used as intermediate supports down the center of a building, or under a carrying beam, and they're spaced about 8 feet apart. In fact, most folks don't even notice the supports—until they're in the way of something.

Mounting shop equipment and jigs to the supports is a novel idea, but these three shop projects are really just a suggestion of the many uses to which the columns can be put. Using the same basic mounting system, anything from a chisel rack to a shop light, or even a third arm to hold plans or drawings can be fastened to an available Lally column. However, use our clamp system only (don't drill through the columns), and don't mount anything too heavy, or that may create undue lateral stress.

With these three projects, I've discovered that the Lally columns that I once considered obstacles are now an integral part of my shop. All three projects are height adjustable, and I can easily move them from one column to another if needed. These pieces are what I call "scrap wood" projects, since many of the parts can be gotten from wood that's left over from other work.

## The Mounting System

The central element to all three projects

is the mounting system that attaches to the Lally column. It's basically just a pair of cleats, bored through at a diameter equal to the column size, and mounted to a pair of supports. Since most Lally columns are a 4 in. diameter, all three of these projects are sized to mount on these 4 in. columns.

Making the cleats is a simple three-step procedure (see Making The Cleats illustrations). Start with a board that's long enough to yield both pairs of cleats. The cleats for each of the projects can be obtained from a single board measuring 1 in. thick by 5 in. wide by 12 $\frac{1}{8}$  in. long. The board size includes  $\frac{1}{8}$  in. extra on both the length and width, to allow for ripping and crosscutting, respectively. If you want to make the cleats for all three projects at once, use a board that's 36 $\frac{5}{8}$

in. long. The  $\frac{5}{8}$  in. extra allows for the five crosscuts needed to yield the six pairs of cleats.

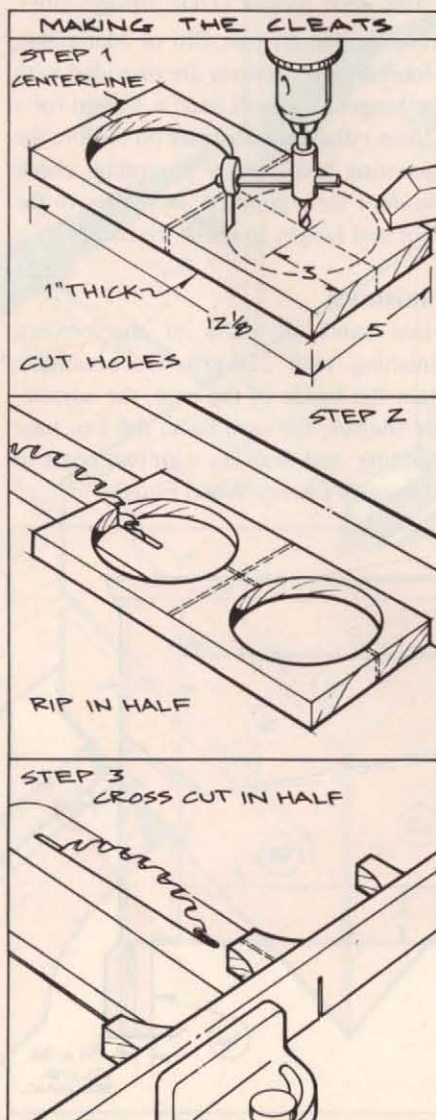
After ripping the cleat stock to the 5 in. width, mark a center line, locate the center points of your holes, then use a circle or fly cutter to cut them out (Step 1). The circle cutter should be run at low speed (about 500 rpm), the feed rate should be slow, and for the smoothest cut it's best to only cut about halfway through, then flip the stock and finish the cut from the opposite side. The drill center of the circle cutter enables you to properly index the cut from the opposite side. You could also cut the hole with a jigsaw, but the circle cutter will yield the most consistent hole size. Then use the table saw to rip the cleat stock down the center (Step 2). The  $\frac{1}{8}$  in. (the saw kerf width) that is lost when you rip the stock down the center allows just the right amount of space to insure a positive squeeze when tightening the cleats on the Lally column. Crosscut the cleat stock to yield each cleat (Step 3).

## Grinder Stand

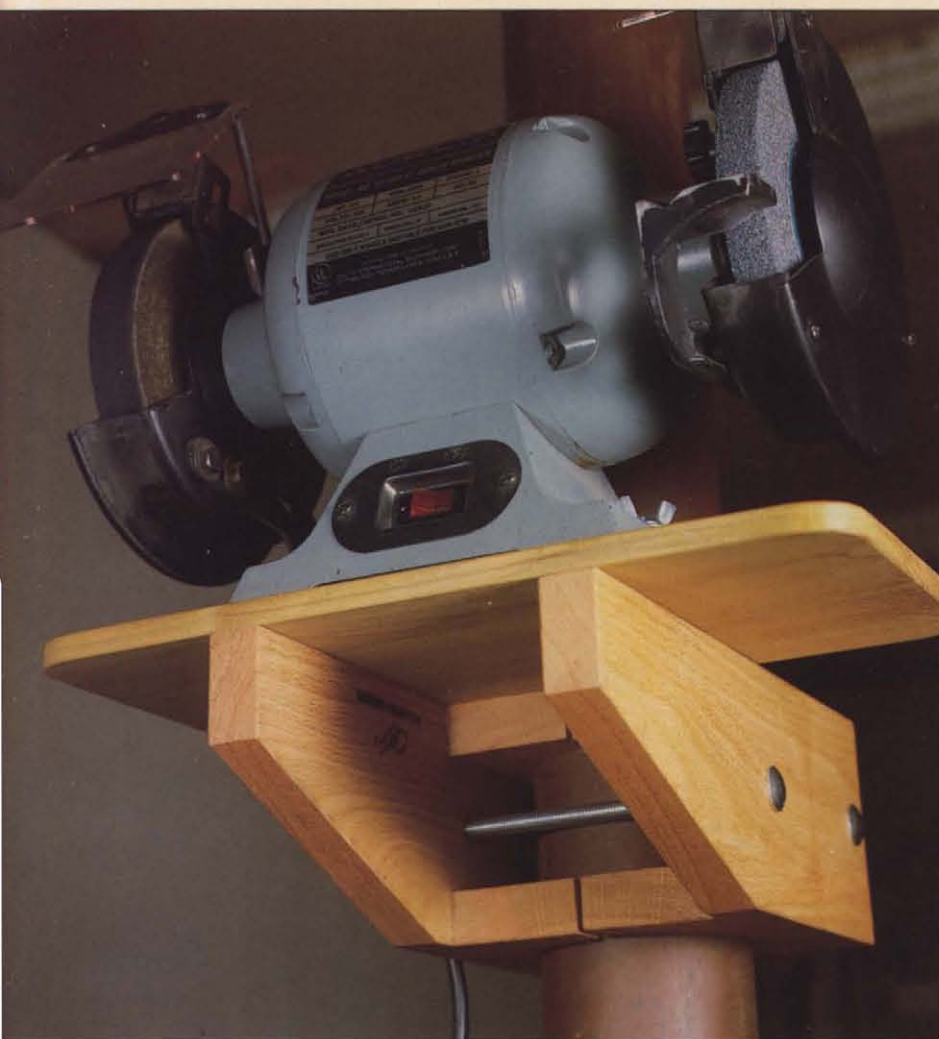
To make the grinder stand, first cut your cleat (A), support (B) and shelf (C) stock to size. Note that the cleat stock from which the four cleats are cut is sized 1 in. thick by 5 in. wide by 12 $\frac{1}{8}$  in. long. Use the circle cutter to cut the 4 in. diameter holes in the cleat stock, then rip and crosscut to yield the separate cleats, as shown in the Making The Cleats step-by-step illustrations. Stack the two supports, then locate and drill the two  $\frac{7}{16}$  in. diameter holes for the  $\frac{3}{8}$  in. diameter by 8 in. long carriage bolts (D).

Cut the taper on the bottom end of the supports, then glue the cleats to the supports, flush with the top and bottom edges. Use screws if you don't want to bother with clamps to hold the parts together while the glue dries.

The grinder stand shown uses  $\frac{1}{4}$  in. diameter lag studs (E) that mount directly through the shelf and into the supports to also anchor the grinder. Studs (sometimes called hanger bolts)



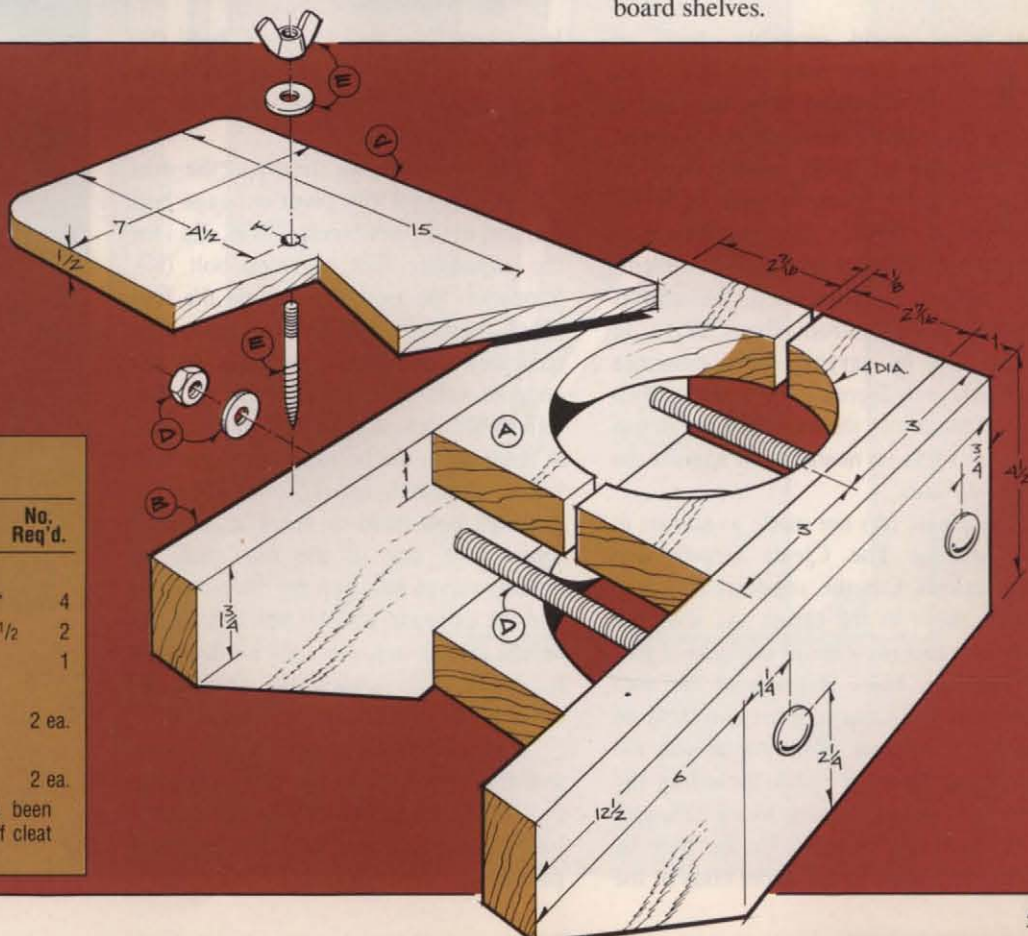




have a wood screw thread on one end and a machine screw thread on the opposite end. The fact that my grinder had a mounting hole spacing of 6 in. on-center enabled me to use these studs to mount both the grinder and the shelf. If your grinder has a different hole spacing, then you'll need to mount the shelf independently.

The procedure for mounting the grinder stand to the column is simple. First, assemble the two support/cleat subassemblies around the column, inserting the bolts and tightening the nuts until the assembly is secure. Use a level to make certain the tops of both supports are on the same plane. Then mount the shelf, and add the grinder. Note that you don't want to glue the shelf to the supports, since that would preclude easily removing the stand in the future.

If you have a basement shop, keep in mind that some large grinders can produce a good deal of vibration, which if not properly dampened, could be transmitted up through the Lally column to the living area above. Fortunately, most grinders sold today include rubber vibration-dampening feet, but if your's doesn't, be sure to add them lest you risk recrimination when your spouse's fine bone china vibrates off the china cupboard shelves.



#### Bill of Materials (all dimensions actual)

| Part           | Description              | Size                      | No. Req'd. |
|----------------|--------------------------|---------------------------|------------|
| <b>Grinder</b> |                          |                           |            |
| A              | Cleat                    | 1 x 27/16 x 6*            | 4          |
| B              | Support                  | 1 x 4 1/2 x 12 1/2        | 2          |
| C              | Shelf                    | 1/2 x 7 x 15              | 1          |
| D              | Bolt/Washer/Nut          | 3/8 dia. x<br>8 long      | 2 ea.      |
| E              | Stud/Washer/<br>Wing Nut | 5/16 dia. x<br>2 1/2 long | 2 ea.      |

\* Cleat size is after cleat stock has been ripped and crosscut. Starting size of cleat stock is 1 x 5 x 12 1/8.





## Sawhorse/Outfeed Table

**Y**ou could probably think up dozens of uses for this Sawhorse/Outfeed table, in addition to the use shown as an outfeed support. Make a pair of these, mount them on adjacent Lally columns, and with the addition of a few 2 x 12's, you'll have an instant auxilliary workbench or assembly surface. As illustrated, the unit is height-adjustable from about 22 to 32 inches, but by varying the dimensions you can easily increase the height capacity. As the photo shows, when not in use the unit folds up neatly to fit against the Lally column.

The cleats (A) are made as shown in the Making The Cleats step-by-step illustrations. Cut the supports (B), and mount them to the cleats. As with the previous two projects in our trio, a pair of carriage bolts (G) mount the two halves of the cleat/support assembly to the Lally column. Now cut to size the remaining wooden parts, including the arm (C), legs (D), foot block (E), and stop block (F). Note the  $\frac{5}{16}$  in. wide by 10 in. long slots in the upper ends of the

legs, enabling the carriage bolt (H) through the arm to slide up and down. These slots give the project much of its height adjustability.

Bore the holes as shown in the arm ( $\frac{1}{4}$  in. dia.) for the pivot carriage bolt (H) and in the foot block ( $\frac{7}{16}$  in. dia.) for the adjustable foot carriage bolt (K). Sandwich the two legs around the foot block, mount the stop block to the arm as indicated and fasten the arm to the support side with a tee hinge (I). The adjustable foot carriage bolt mounts into a T-nut (J) in the bottom end of the foot block. A crutch tip (L) slips over the carriage bolt head to serve as a cushioned foot, one of the nuts and the washer serves as a stop for the crutch tip and the extra nut enables you to lock the height setting in place. Like all the other hardware, the crutch tip should be available at your local hardware store.

Sand and finish the table to suit. Note that the wing nut on the pivot carriage bolt (H) enables the leg to be quickly locked tight in either the open or closed position.

### Bill of Materials (all dimensions actual)

| Part                           | Description              | Size                   | No. Req'd.        |
|--------------------------------|--------------------------|------------------------|-------------------|
| <b>Saw Horse/Outfeed Table</b> |                          |                        |                   |
| A                              | Cleat                    | 1 x 27/16 x 6"         | 4                 |
| B                              | Support                  | 1 x 4 1/2 x 6          | 2                 |
| C                              | Arm                      | 1 1/4 x 1 3/4 x 24     | 1                 |
| D                              | Leg                      | 1/2 x 1 1/4 x 30 1/2   | 2                 |
| E                              | Foot Block               | 1 1/4 x 1 3/4 x 3      | 1                 |
| F                              | Stop Block               | 1 1/2 x 1 3/4 x 3      | 1                 |
| G                              | Bolt/Nut/Washer          | 3/8 dia. x<br>8 long   | 2 ea.             |
| H                              | Bolt/Washer/<br>Wing Nut | 1/4 dia. x<br>3 long   | 1 ea.             |
| I                              | Tee Hinge                | 3 1/2 wide x<br>5 long | 1                 |
| J                              | T-Nut                    | 3/8-16                 | 1                 |
| K                              | Bolt/Washer/Nut          | 3/8 dia. x<br>6 long   | 1 ea.<br>(2 nuts) |
| L                              | Crutch Tip               | 3/4 dia. socket        | 1                 |

\* Cleat size is after cleat stock has been ripped and crosscut. Starting size of cleat stock is 1 x 5 x 12 1/8.











## Utility Shelf

**S**helves in the shop are always useful and this one is such that you could even use it in a basement rec room. You could also mount several on one column to create a storage tree. I admit that the Formica and edge banding are extravagant for a shop project, but I put them in to demonstrate how pretty this shelf can be, if you plan other uses for it. It's also a good opportunity to practice laying up laminate and edge banding on a small scale with low risk.

The cleat (A) and support (B) assembly is nearly identical to that on the grinder stand; the only difference being the length of the supports. Refer to the Making The Cleats step-by-step illustrations for cutting the cleats, and to the Grinder Stand instructions for the cleat/support assembly details.

### Making The Shelf

The 22 in. diameter shelf (C) is made from  $\frac{3}{4}$  in. thick plywood. Because the

supports are sturdy, you could increase the shelf diameter up to about 30 in., or alter the shape from round to square or whatever suits your needs.

Start by cutting two pieces of  $\frac{3}{4}$  in. plywood, each 11  $\frac{1}{4}$  in. wide by 22  $\frac{1}{2}$  in. long. Plow  $\frac{1}{4}$  in. wide by  $\frac{3}{8}$  in. deep grooves in the mating edges for a spline, which is cut to size from  $\frac{1}{4}$  in. thick plywood. The spline is needed to keep the two halves of the shelf indexed. Glue the spline into one of the two halves.

Next, temporarily clamp the two halves together, edge-to-edge, locate the centerpoint, and scribe a 22 in. diameter circle. A large compass, a trammel or a string and pencil will all work. Cut the rough diameter with a jigsaw, staying about  $\frac{1}{4}$  in. off the line.

Next, the 22 in. diameter circle is final cut using the router, a straight cutter, and a trammel attachment. Some routers come with a trammel accessory, but a shop-made trammel can simply be a length of plywood ( $\frac{1}{4}$  in. to  $\frac{1}{2}$  in. thick),

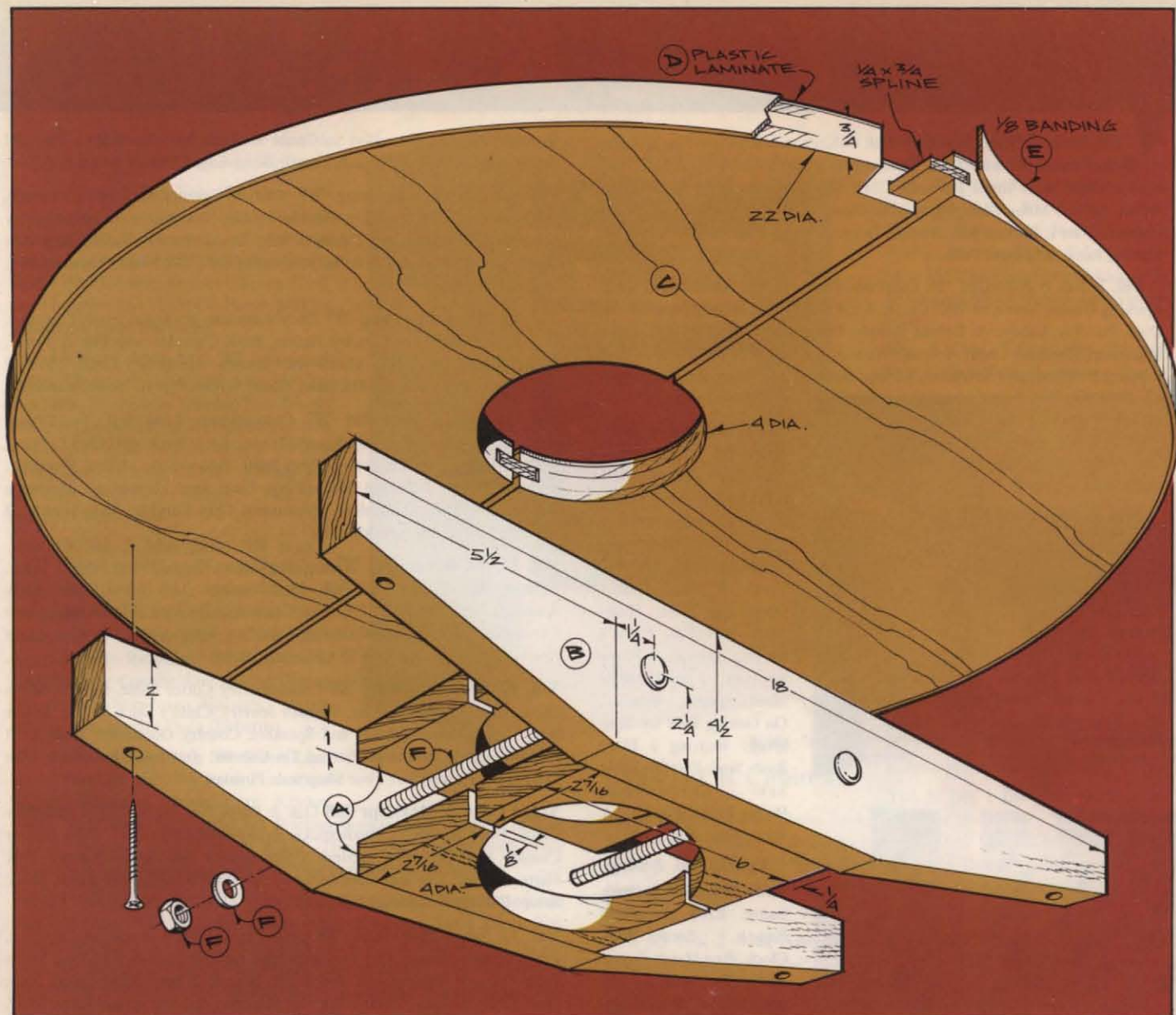
with the router fastened to one end, and a nail located near the other end, 11 in. from the centerpoint of the bit.

With the two halves still butted together (replace the clamps, which will be in the way, with masking tape), drill a hole at the center point for the trammel pivot. Now, using the straight bit and making repeated passes (each about  $\frac{1}{8}$  in. deep), clean up the 22 in. diameter to produce a perfect circle. (If you don't plan on using the laminate and applying edge-banding, there's no need to smooth the diameter to a perfect circle). Once again, apply clamps across the two halves, then use the circle cutter to make the Lally column hole.

### The Laminate

Applying the laminate (D) is easy. Each half of the shelf is worked separately. Following the manufacturer's instructions, coat the mating shelf and laminate surfaces with contact cement, apply the laminate, then trim the edges with the





router equipped with a flush trimming bit.

### The Edging

Edge banding (E) protects the raw edge of the plywood, prevents chipping and improves the overall appearance. Rip about 8 ft. of 1 in. wide by 1/8 in. thick stock (I used oak). Although each half of the shelf requires a little less than 3 ft. of banding, the extra length is helpful when clamping, so cut the banding into two 4 ft. lengths.

Using yellow glue, apply the banding. Use clamps and clamping blocks (the cutoffs from the circle are perfect for this) to hold the banding while the glue dries, or just tie some twine around the perimeter, and use a dowel and a tourniquet twisting technique to tighten

the twine. Once the glue has dried, trim the excess banding length, then use the router and flush trimming bit to flush the banding with the top and bottom surfaces of the shelf. Like the other two projects, the wood surfaces of the Utility Shelf should be coated with a protective finish, such as polyurethane.

### Mounting the Utility Shelf

Note that the shelf halves are screwed but not glued to the supports. Since the shelf halves run perpendicular to the supports (necessary for strength) they must be mounted after the support/cleat assembly is mounted to the Lally column. The screws hold the shelf sections to the supports, but can be quickly backed out if you need to remove the shelf or move it to another column. 

### Bill of Materials

(all dimensions actual)

| Part                 | Description      | Size                 | No. Req'd. |
|----------------------|------------------|----------------------|------------|
| <b>Utility Shelf</b> |                  |                      |            |
| A                    | Cleat            | 1 x 2 7/16 x 6*      | 4          |
| B                    | Support          | 1 x 4 1/2 x 18       | 2          |
| C                    | Shelf            | 3/4 x 22 dia.**      | 1          |
| D                    | Plastic Laminate | As needed            | 1          |
| E                    | Edge Banding     | As needed            | 1          |
| F                    | Bolt/Nut/Washer  | 3/8 dia. x<br>8 long | 2 ea.      |

\* Cleat size is after cleat stock has been ripped and crosscut. Starting size of cleat stock is 1 x 5 x 12 1/8.

\*\* Note that shelf is in two equal halves.



# BACK ISSUES

**Vol. 9 No. 3 May-June '85** Wall Cabinet with Recessed Finger Pulls, Shaker Desk, Kitchen Cart, Contemporary Wall Clock, Colonial Wall Sconce, Card Box, Towel Bar with Glass Shelf, Marble Race Toy, Cradle, Vanity Mirror, Miter Clamping Jig, Jacobean Joint Stool; *Articles:* Product Liability: Part I; Restoring an Antique Frame; Coping with Wood Movement; Making Recessed Finger Pulls.

**Vol. 9 No. 6 Nov-Dec '85** Dulcimer, Dining Table, Shaker Washstand, Marking Gauge, Veneered Wall Clock, 4 x 4 Off-Roader, Teddy Bear Puzzle, Duck Pull-Toy, Landscape Cutting Boards, Early American Tall Clock, Desk Organizer, Moravian Chair; *Articles:* Weaving a Rush Seat, Part I; Table Saw Ripping Problems and Solutions; 4-Piece Book Match Veneering; Running a Profitable Business.

**Vol. 10 No. 1 Jan-Feb '86** Chippendale Bachelor's Chest, Oriental Serving Tray, Country Bench, Antique Knife Tray, Tape Dispenser, Valentine Box, Toy Tow Truck & Car, Shaker Drop-Leaf Table, Shop-Made Bow Saw, Child's Settle Bench, Plate Shelves, Freestanding Shelf System; *Articles:* On Getting Paid for Your Work; Weaving a Fiber Rush Seat, Part II; Table Saw Crosscutting; Router-Lathe Fluting: A Shop-Made Approach.

**Vol. 10 No. 3 May-June '86** Contemporary Lamp, Early American Bench, Steam-Bent Clock, Pine Hutch, Goose Basket, Toy Crane, Condiment Holder, Shop Workstation, Parsons Table, Shaker Lap Desk, Victorian Whatnot Shelf; *Articles:* Toymaker Clare Maginley; Flattening Warped Boards; Choosing a Router; Supported Steam Bending.

**Vol. 10 No. 4 July-Aug '86** Wall-Hung Display Cabinet, Latticework Planter, Country Bucket Bench, Adirondack Chair, Coffee Mill, Clamdigger's Basket, Box of Shapes Toy, Disk Clock, Tenon Jig, Dictionary Stand, Shaker Slat-Back Side Chair; *Articles:* Selecting the Right Project for Production; More About Warped Boards; All About Router Bits; Sliding Dovetail Joints.

**Vol. 10 No. 5 Sept-Oct '86** Vanity Case, Stool, Coffee Table, Blanket Chest, Mortar and Pestle, Whale Folk Art Silhouette, Toy Wagon, Cranberry Rake, Router Bit Box, Shaker Drop-Leaf Table, Desk with Tambour Top; *Articles:* Are Your Prices Competitive?; Restoring a Rosewood Chair; Basic Router Operations; Making Tambour Doors.

**Vol. 11 No. 1 Jan-Feb '87** Glass-Top Dining Table, Dovetailed Stool, Jewelry Box, Door Harp, Toy Firetruck, Canada Goose Mobile, Balancing Sawyer Folk Toy, Early American End Table, Jointer Push Board, Shaker Blanket Chest; *Articles:* Defining the Market for Your Work; Old Wood; The Mortise and Tenon, Part I; Hand/Router Dovetailing.

**Vol. 11 No. 2 Mar-Apr '87** Garden Bench and Table, Mirrored Wall Shelf, Rhombohedron Puzzle, Wood Sawyer Whirligig, Folk Art Door Stop, Kangaroo Pull Toy, Colonial Wall Shelf, Contemporary Hall Table, Shaker

Sewing Desk; *Articles:* How to Create a Direct Mail Promotion; Types of Finish; The Mortise and Tenon, Part II; Bevel-Edged Drawer Bottoms.

**Vol. 11 No. 3 May-June '87** Kitchen Canister Set, Riding Biplane, Contemporary Serving Cart, Napkin Holder, Decorative Planter, Country Vegetable Bin, Medicine Cabinet, Shop Drum Sander, Vienna Regulator Clock, Display Pedestal; *Articles:* Penetrating Oils; The Jointer; Veneer, Part I; Dovetail Key Butt-Miter.

**Vol. 11 No. 4 July-Aug '87** Early American Bookcase, Trash Container, Low-Cost Workbench, Country Basket, Desk Calendar with Pen & Pencil, Butterfly Pull Toy, Vanity Mirror with Drawer, Apothecary Chest, TV/VCR Cabinet; *Articles:* Shellac; The Hand Plane; Veneer, Part II; Incised Carving.

**Vol. 11 No. 5 Sept-Oct '87** Contemporary Love Seat, Two-Drawer Platform Bed, Snail Pull Toy, Routed Trivets, Spice Rack with Chip Carving, Joiner's Tool Chest, Shaker-Style Step Stool, Turned Shop Mallets, Woodbox; *Articles:* French Polishing Made Easy; Plane Iron Sharpening; Making a Splayed Leg Drill Guideblock; Traditional Chip Carving; Shop-Tested: 12 Jigsaws; Making the Knuckle Joint.

**Vol. 11 No. 6 Nov-Dec '87** Rocking Horse, Three-Drawer Jewelry Chest, Tapering Jig, Rolling Toy, Folk Art Silhouette, Two Towel Racks, Early American Style Wall Shelf, Corner Cupboard, Stacking Wine Racks, Curio Cabinet; *Articles:* Glues and Gluing; Band Saw Setup; Making the Continuous Bracket Foot; Step-By-Step To a Flawless Finish.

**Vol. 12 No. 1 Jan-Feb '88** Contemporary Coffee Table, Puss 'n Books Bookends, Cookbook Holder, Wooden Jewelry, Child's Duck Puzzle, Shaker Wall Clock, Stereo Cabinet and Speakers, Country Occasional Table, Drill Press Jig, Early American Pierced Tin Cabinet; *Articles:* Edge-Gluing; The Drill Press; Pierced Tin; Four Shopmade Finishes.

**Vol. 12 No. 2 Mar-Apr '88** Oak & Glass Tier Table, Crystal Regulator Clock, Early American Candlesticks, Arrow Wall Decoration, Three-Drawer Country Wall Box, Key Cabinet, Contemporary Box, Shaker Carrier, Folk Harp; *Articles:* Use and Sharpening of the Hand Scraper; The Lathe: Basic Setup; Quartered Turnings; Lacquer.

**Vol. 12 No. 3 May-June '88** Loon Carving, Early American Dry Sink, Contemporary Dresser, Old-Time Pipe Box, Antique Knife & Fork Tray, Dutch Tulip Folk-Art Silhouette, Colonial Salt Box, Bud Vase, Miter Gauge Stop, Hunt Table; *Articles:* Spindle Turning; Selecting and Sharpening Lathe Tools; Recessed Finger Pull Step-by-Step; Coloring Wood: An Overview.

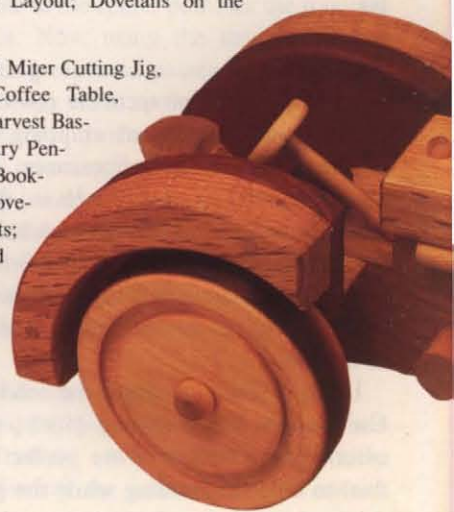
**Vol. 12 No. 4 July-Aug '88** Magazine Rack, Occasional Table, Mitered-Corner Box, Heart Stool, Decorative Cutting Boards, Piggy Bank, Turned Bowl, Country Cupboard, Four-Drawer Lamp; *Articles:* Faceplate Turning; Workshop Layout; Dovetails on the Table Saw; Staining Basics.

**Vol. 12 No. 5 Sept-Oct '88** Miter Cutting Jig, Captain's Clock, Country Coffee Table, Rooster Folk-Art Silhouette, Harvest Basket, Bird Push Toy, 18th-Century Pencil Post Bed and Nightstand, Bookcase Desk; *Articles:* Wood Movement; Joining Ring Segments; Drill Bits; Filling Open-Grained Woods.

**Vol. 12 No. 6 Nov-Dec '88** Shaker High Chest, Table Saw Crosscut Box, Country Vegetable Bin, Whale Pull Toy, Colonial Wall Sconce, Treetop Christmas Ornament, Classic Pickup Truck, Contemporary Cradle, Child's Carousel Lamp; *Articles:* Flattening Wide Surfaces with the Hand Plane; Making a Cove-



**Oval Extension Table M/J '89**



**Toy Farm Tractor J/A '89**



**To order, use form and envelope bound in the center of this issue or write:  
The Woodworker's Journal, P.O. Box 1629, New Milford, CT 06776; tel. (203) 355-2694.**

Edged Raised Panel: Core-Box Bit Method; Polyurethane; A Sander For Large Surfaces.

**Vol. 13 No. 1 Jan-Feb '89** Shop-Built Disk Sander, Cherry Table, Wall Clock, Rock and Roll Toy, Contemporary Candlesticks, Merganser Decoy, Child's Table and Chairs, Shaker Wall Cabinet; *Articles:* Buying Hardwood Lumber; The Thickness Planer; Making Breadboard Ends; Ebonizing.

**Vol. 13 No. 2 Mar-Apr '89** Adirondack Settee, Country Village, 18th-Century Tilt-Top Table, Toy Fishing Trawler, Two Trivets, Folk-Art Cow, Greek Revival Birdhouse, Pine Armoire, Oriental Mirror; *Articles:* Transferring and Enlarging Patterns; Making Tripod Legs; Three Easy Finishes for Pine; The Portable Circular Saw.

**Vol. 13 No. 3 May-June '89** Storage Seats, Table Saw Gauge, Oval Extension Table, Nessie Pull Toy, Back Massager, Decorative Wall Key, Country Wall Shelf, Contemporary Mirror, Jewelry Chest; *Articles:* Panel Retainer Disk System; Understanding Circular Saw Blades; Cutting Box Joints; Non-Toxic Finishes; Massachusetts Woodworker Paula Garbarino.

**Vol. 13 No. 4 July-Aug '89** Shaker Long Bench, Folk-Art Sign, Toy Farm Tractor and Wagon, Miniature Flower Cart, Kitchen Tongs, Wall Cabinet with Tinsel Art, Stacking Bookshelves, Country Pie Safe; *Articles:* Dealing with Uneven Wood; Tinsel Art; Coping with Your Radial-Arm Saw; Brushing Lacquer; A Visit to a Woodworking Show.

**Vol. 13 No. 5 Sept-Oct '89** Country Bake-Room Table, Chippendale Small Chest, Stacking Desk Trays, Pencil Box, Apple Doorstop, Space Shuttle Toy, Marquetry Coasters, Ice Chest with Marbleized Top, Globe Stand; *Articles:* Table Saw Basics; Cutting Full-Blind Dovetails; Marquetry: The Pad Method; Marbleizing; Mount Lebanon Shaker Village: A Museum in the Making; Tool Review: Four Portable Planers.

**Vol. 13 No. 6 Nov-Dec '89** Mission Style Trestle Table, Jewelry Box, Kids' Bobsled, St. Nicklaus Carving, Carousel Toy, Box Drum, Dancing Man Folk Toy, Towel Rack, Secretary Desk, Bed Tray; *Articles:* Mortising Butt Hinges; Dado Heads; Marquetry: The Empty Window Method; Aniline Dyes; Lynes Unlimited: Making Toys in a Kansas Chicken Coop.

**Vol. 14 No. 1 Jan-Feb '90** Mortise & Tenon Mirror, Weaver's Chest of Drawers, Tissue Box Cover, Band-Sawn Napkin Holder, Grasshopper Pull Toy, Compact Disc Holder, Shop-Built Spindle Sander, Wall-Hung Ironing Board, Tavern Table; *Articles:* Clamps: One Shop Tool You Can't Do Without; How to Hang Wall Cabinets; Marquetry: The Direct Method; A Guide to Wax and Polish; Special Section: Back Issue Index.

**Vol. 14 No. 2 Mar-Apr '90** Small Early American Mirror, Shop-Built Sanding Blocks, Cookie Jar Holder, Hourglass, Candle Holder, Toddler Cart, Folk Fiddle, Plant Stand, Santa Fe Bench; *Articles:* Making Drawers; Using Router Bits in the Drill Press; Finishing Outdoor Projects; Making Curved Instrument Sides; A Conversation with the Westovers.

**Vol. 14 No. 3 May-June '90** Garden Table & Chair, Planter Box, Stackable Shoe Rack, Victorian Wall Shelf, Child's Stepped-Back Cupboard, Cat Push Toy, Tabletop Armoire, Shaker Tall Clock; *Articles:* Japanese Saws; Gluing Oily Woods; Tung Oil; Make a Tombstone Frame-and-Panel Door; Are Woodworkers Killing Our Rain Forests?



**S/O '90  
TV/VCR Cabinet**

**Vol. 14 No. 4 July-Aug '90** Slant-Back Cupboard, Folding Deck Table, Two Toy Dragsters, Colonial Sign, Barbecue Tray, Workbench Helper, Harvest Table, Plate Rack, Sunburst Mirror; *Articles:* Rasps; Safety: Workshop Finishes Pose Risks; Making the Dovetailed Wedge; Knock-Down Hardware.

**Vol. 14 No. 5 Sept-Oct '90** TV/VCR Cabinet w/Pocket Doors, Shaker Woodbox, Cabinet with Punched Tin Doors, Sushi Set, Carved Pineapple, English Cutlery Tray, Toy Train Set, Workbench, Portable Tool Chest; *Articles:* Files and How to Use Them; Compound Angle Dovetails; Water-Based Finishes; Making the Slip Joint; Shop Test: 6 Dovetail Jigs.

**Vol. 14 No. 6 Nov-Dec '90** Provincial 4-Poster Bed, Jewelry Box, Christmas Angel Folk Carving, Rocking Dolphin, Walnut Hand Mirror, Perpetual Calendar, Hanging Bird Feeders, Country Pine Table, Shaker Chest of Drawers; *Articles:* The Shaper; Finishing Problem Woods; 20 Ways to Hang a Shelf; Inlay Mother-of-Pearl.

**Vol. 15 No. 1 Jan-Feb '90** Santa Fe Chair, Santa Fe Table, Clamp Rack, Provincial Bench, Step Stool, Box with Marquetry Top, Ash Wall Desk, Fork Lift Toy, Connecticut River Valley Highboy, Part 1; *Articles:* Tempering Steel Tools; Three Easy Finishes for Oak; Making a Cabriole Leg; Hand-Cut Dovetails; *Special Section:* Back Issue Index.

**Vol. 15 No. 2 Mar-Apr '91** Redwood Potting Bench, Roadster, Early American Style Curio Shelf, Sink-Top Cutting Board, Pine Vanity, Window-Mounted Birdhouse, Octagonal Jewelry Box, Connecticut River Valley Highboy, Part 2; *Articles:* Spokeshaves; Tabletop Finishes; Wood Movement; An Easy-to-Make Wooden Hinge; Tool Review: Palm Sanders.

**Vol. 15 No. 3 May-June '91** Router Storage Cabinet, Eli Terry Shelf Clock, Adirondack Rocker, Pennsylvania Small Chest, Dresser-Top Coin Bank, Oak Music Stand, Toy Airport Baggage Train, Pierced-Tin Spice Cabinet; *Articles:* Boring Square Holes: Hollow-Chisel Mortising with your Drill Press; Resawing: How to Get Thin Boards from Thick Stock; Two Traditional Inlay Methods: The Line & Berry and Banding; Tips for Mess-Free Finishing; Tool Review: What's Available in Low-Cost Dust Collection Systems.

**Vol. 15 No. 4 July-Aug '91** Mountain Dulcimer, Shaker Drop-Leaf Table, 4 Easy Picture Frames, Shop-Made Lathe Chuck, Napkin Holder, Fisherman Whirligig, Horse & Cart Toy, Gumball Machine; *Articles:* Shaping on a Table Saw; Turning Small Boxes; Low-Tech Picture Frames: Use Simple Hand Tools for a Professional Job; Working with Gel Stains; Tool Review: Thin Kerf Blades.

**Vol. 15 No. 5 Sept-Oct '91** Colonial Bench, Shop-Built Mortising/Tenoning Table, Pine Wall Cabinet, Gun/Bookcase/Curio Cabinet, Tilt-Action Dump Truck, Four Easy-to-Make Kitchen Projects: Cooling Rack, Salad Tongs, Serving Board, Recipe Box; *Articles:* Secret Compartments; Making Dadoes: Simple Joints for Simple Casework; The New Safe Strippers: How Well Do They Work?; Tool Review: Scroll Saws for Under \$200.

**Vol. 16 No. 1 Jan-Feb '92** Country Pine Mirror, Drop-leaf Dining Table, Chess Set, Shop Workcenter, Bandsawn Heart Box, Scroll-sawn Door Harp, Classic Firetruck, Toucan-on-a-Branch, Window Valance; *Articles:* Safer Router Bit Designs and New Accessories; Dutch Turning; Veneering; Tool Review: Plunge Routers; Special Section: Back Issue Index.



# THE WOODWORKER'S MARKETPLACE

## ADIRONDACK SWING

Comfortable & easy to build.  
Detailed Swing Plan - \$9.90.  
Swing & A-Frame Plan - \$12.90  
Photo catalog \$2.00 (credited)  
or FREE w/ order.

**PLANCRAFT™**

Box H1779,  
Hernando, FL 32642-1779



## FREE Plans! for SCOOP™ Chair

& brochure of new patented  
furniture plans & hardware

### Heartwood Furniture

381 Mt. Pleasant, B-1  
Freeville, NY 13068

folds flat!



## HOMECRAFT VENEER

### DOMESTIC AND IMPORTED VENEERS

Over 140 varieties of Veneers. Complete Line of Tools for Veneering, Laminating and Marquetry.—Cements and Glues. Simplified Veneering Instructions and price list sent for \$1.00. **HOMECRAFT VENEER**  
901 West Way; Latrobe, Pa. 15650



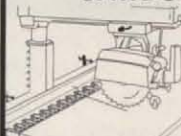
## QUALITY THAT'S TOP DRAWER...

...for all your drawers. If it's pulls you need, we've got you covered. Whether it's Chippendale or Queen Anne, Hepplewhite or Victorian, we'll help you get a handle on it. It's all there in our new 70-page catalog—a valuable reference tool that fully describes our expanded line of period hardware. To get your copy, please send \$4.00 to:

**PAXTON HARDWARE LTD.**

7818 Bradshaw Road, Dept. WJ12, Upper Falls, MD 21156  
Quick Shipment Free Mini-Catalog

## • SAWDUST ELIMINATOR •



Eliminate the sawdust between your work and table fence. Sawdust will not accumulate against fence. Work is placed accurately, for true cuts using THE Radial Saw SAWDUST ELIMINATOR

**\$19.95**

Plus \$3.00 S & H Fl. + \$1.20 Tax



**BILNOR ENTERPRISES**

P.O. Box 1229  
Loxahatchee, FL 33470

CALL TOLL FREE 1 (800) 742-3718



## Breathe Easier!



Powered Air  
Respirators  
for Wood Dust

**\$325** Model AGH1

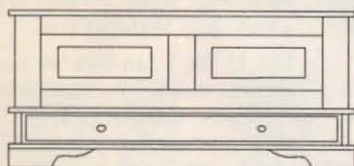
Excellent for all woodworking jobs which create "DUST." Also offers eye protection. Systems also available for paint and lacquer fumes.

## AIRSTREAM DUST HELMETS

21344 Ave. 332 Woodlake, CA. 93286

Toll Free 1-800-637-6606 Fax: 209-564-8073

## Colonial Cedar Chest



Store your heirloom quilts and linens in this Early American Country blanket chest!

- Authentic Design
- Professional, Fully-Dimensioned Plans
- Bill of Materials
- Complete Assembly Instructions

Send check or M.O. for \$21.95 to:

Accent Furniture Designs

PO Box 780941

San Antonio, TX 78278-0941

(Tx. res. please add 8.25% sales tax)



MADE IN U.S.A.

## BUILD YOUR OWN DOG KENNEL!

USING THIS PROVEN PLAN

Beautiful Economical

Portable

Durable



Make various sizes and shapes by easily bolting sections together. Help form healthy habits and happy pets with this proven plan!

Kennel Plan ..... \$14.95

Kennel & Dog House Plans (Med. & Lrg. with removable roof and insulating air pockets) .... \$19.95

Send Check or M.O. To:

**EVER-STURDY**

Dept. WJ, P.O. 1609, E. Greenwich R.I. 02818

7% Tax R.I. Res. Only.

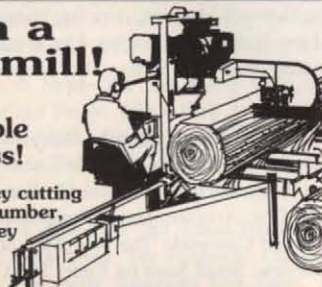
## Wood-Mizer®

World's Largest Manufacturer of Portable Sawmills

## Own a Sawmill!

Start a  
Profitable  
Business!

Save money cutting your own lumber, make money cutting for others.



1-800-553-0219

32 Page Full Color Catalog - \$2.00  
66-minute demonstration video - \$10.00  
MasterCard or Visa accepted

8180 West 10th Street • Dept. MM18  
Indianapolis, Indiana 46214-2400

## SAVE HUNDREDS OF \$\$\$

MY DADDY BUILT ME MY OWN PLAYSET  
AND YOURS CAN TOO WITH OUR EASY TO BUILD,  
FULLY ILLUSTRATED DRAWING PACKAGE.

YES, YOU NOW CAN SAVE HUNDREDS OF DOLLARS BY BUILDING YOUR CHILD HIS OR HER OWN PLAYSET. NOT ONLY WILL YOU SAVE MONEY BUT YOU CAN CONTROL THE QUALITY OF THE CRAFTSMANSHIP AND MATERIALS.

YOUR KIDS  
WILL  
LOVE IT!!!

### OUR PACKAGE INCLUDES:

- ACCURATE COMPUTER DRAWN PLANS & DETAILS.
- STEP-BY-STEP FULLY ILLUSTRATED ASSEMBLY INSTRUCTIONS.
- COMPLETE MATERIAL LIST.
- DIMENSIONED CUT DRAWINGS.

- A VALUABLE INVESTMENT
- QUALITY THAT LASTS
- FAMILY FUN



MODEL: FORT DESERT FOX

Satisfaction Guaranteed!  
or your money back

**\$12.95**

plus \$1.50 s/h  
Check or  
Money Order

**THE WOODEN PLAYGROUND**

P.O. BOX 24526, DEPT. WJ2  
HOUSTON, TX 77229-4526

(All orders shipped within 48 hours from receipt of order)



# THE WOODWORKER'S MARKETPLACE

**BUILDING? RESTORING? REPAIRING?** Use Chem-Tech, the epoxy glue professionals use. Strength and reliability proven in boats and aircraft over 15 years. Introductory Offer: 1/2 pt. T-88 Epoxy Glue only \$9.95 ppd. USA Orders shipped within 48 hrs. Technical staff on call to answer your questions. Chem-Tech, Dept. WJ, 4669 Lander Rd., Chagrin Falls, OH 44022; (216) 248-0770. VISA/MC welcome.



## SWINGING CRADLE EASY TO MAKE WITH



### Full-Size Plan

Authentic spindle design straight out of Colonial America. Plans show alternate construction with panel sides. Perfect for baby or use for magazines. Size: 20" x 39" x 30" high.

Plan #166 ..... \$12.95  
(catalog free with order)

CATALOG 200 full-size professional furniture plans — \$3.00

FURNITURE DESIGNS, INC., Dept. JS-72  
1827 Elm Dale Ave., Glenview, IL 60025 — (708) 657-7526

Complete Descriptive Plan  
**CATSKILL SWING**  
Add this classic American Swing to your home.



Our plan booklet provides step by step instructions, a list of materials, and a process of assembly easy for anyone to understand. Order your plan booklet now!

Plan #169 ..... \$12.95  
F & B Associates  
C. P. Bradley, Schoonmaker Lane; Stone Ridge, N.Y. 12484

## Customers are Waiting... RESTORE FURNITURE!

\$200-\$1000 a day secure cash business! Low set-up costs; unlimited market! Complete training; no prior experience. Part-time; full-time. Turn-key business perfect for men, women, families.

Make Molds\*Veneer\*Resilver  
Strip\*Repair\*Refinish  
Business Preview Video \$19.95  
Catalog \$2.00  
MINUTEMAN, INC., Ste.6  
Box 8, Waterloo, WI 53594  
1-800-733-1776



## Pattern—Folding Rocking Chair

Build for Profit or for your own Patio. Detailed Instructions. Send \$10.95 to:

Howard Carol Chairs Inc.  
Box 820517 Dept. WJ  
Ft. Worth, TX 76182-0517



## Large Machinist Tool Chest & Base

Size 11" x 25" x 27"  
Plan #128... \$29.95 + \$3.00 s/h  
Morrison Originals  
784 Marlborough  
P.O. Box 15272 Dept. WJ-2  
Detroit, MI 48215-2949



## WOODCRAFT

FULL SIZE PATTERNS  
SIMPLE TO MAKE • FUN • PROFITABLE

Check the Packets of Interest to YOU!

- ☐ 100 yard ornaments animals, birds, signs, more!
- ☐ 200 pattern Fun Packet for scroll, band & jigsaws!
- ☐ Show stoppers - 22 craft show top-sellers!
- ☐ 25 fun, profitable "wind-action" whirligigs.
- ☐ Attractive Dutch Windmill - 5 feet tall, including blades.
- ☐ Country Critters - 100 patterns, decorative projects!
- ☐ Yard Characters - Dutch, Amish, bending lady, more.
- ☐ Yard Critters - sheep, pig, geese, chickens, more!
- ☐ Decorative Wishing Well/Planter - 6 feet tall.
- ☐ Over 20 quick and easy bird houses.

Send \$8.00 per packet. Pick 3 for only \$18.00

ACCENTS, Dept. MJ22, Box 7387, Gonic, NH 03339  
WOODCRAFT CATALOG - \$2.00 (Free with order)

# CLASSIFIEDS

The Classified rate is \$2.00 per word, payable with order. Minimum ad length is 15 words. Closing date is the 10th of the third month preceding the issue (8/10 for the Nov/Dec issue). Count each word and initial; phone number is one word; state and zip are one word. Send copy and check to **The Woodworker's Journal, Classified Dept.**, P.O. Box 1629, New Milford, CT 06776.

## BOOKS

Fine-Tune Chisels, Planes. Step-by-step 30+ page illustrated book. Includes shaping, sharpening, heat-transferring, more. \$10 check or M.O. to: Designs by Carl R., Dept. FTWJ, 3104 Cross Valley Road, Knoxville, TN 39717.

Free illustrated catalog of books for woodworkers: instructions, plans, scaled drawings, patterns for furniture, toys, house carpentry, duck decoy, bird and figure carving, chip carving, wood sculpture, lathe work, more. Most \$4.00 to \$6.00. Write Dover Publications, Dept. A158, 31 E. 2nd Street, Mineola, NY 11501.

## CATALOGS

\$150 Daily Woodworking. Unusual, proven enjoyable. Exciting brochure \$1.00. Pine Shop, 897-3 Mammoth Road, Manchester, NH 03104.

Create Stained Glass—Glass, tools, supplies, lamps, books, more. Catalog \$1.00. AmeriGlas, MWJ208, Box 27668, Omaha, NE 68127-0668.

Chair Caning Supplies—cane webbing, rush, splint, ash, rawhide, cord. Catalog \$1.00 (refundable). Caning Shop (WJ), 926 Gilman, Berkeley, CA 94710.

Build, Restore, Repair, Refinish: Carvings, Moldings, Brass, Hardwoods, Veneers, Upholstery, Caning, Lamps. \$1.00 for unique wholesale catalog. Van Dyke's, Dept. 83, Woonsocket, SD 57385.

Doll Houses and Accessories—Distributors Catalog \$10.00 (\$5.00 refundable). Happy House Miniatures, 135 N. Main St., Dept. WWJ791, Mocksville, NC 27028.

Free Plans and \$16 in Coupons with our Woodcrafts Catalog. \$1.00. GCW, 1615 Wimbledon Drive, Dept. WJ1, Auburn, CA 95603.

50% Discount. Brass and Stainless Screws. Tools. Small quantities, free catalog. Elwick, 230 Woods Lane, Somerdale, NJ 08083.

300+ Plans—Build shop machines and accessories. Catalog \$1.00 (refundable). Wood-Met, (WJ), 3314 Shoff, Peoria, IL 61604.

## CLOCK PLANS & PARTS

Build clocks for profit (cost under \$8.00 each)! Our videos show you how! Wholesale clock catalog \$3.00 (credited) contains over 1500 items! Steebar, P.O. Box 463-E, Andover, NJ 07821-0463.

## LUMBER

"Good Wood," PA Hardwoods, many species, many sizes, S4S, UPS delivery. Free catalog: Croffwood Mills, R. D. 1, Box 14J, Driftwood, PA 15832.



# CLASSIFIEDS

Figured Lumber sequentially sawn and numbered, kd; burls, curly, quilt, mod-eled, spalted; bowl blanks. Over 500,000 pounds in inventory. J.K.W.P.; (503) 247-7875.

Dulcimer Builder Supplies, precision milled and fine sanded dulcimer and hammered dulcimer woods. Cherry, walnut, paduk, rosewood, birdseye, and curly maple, Sitka spruce, W.R. cedar; related hardware, strings and accessories. 85¢ stamp for brochure. Folkcraft Instruments, Box 807-W, Winsted, CT 06098; (203) 379-9857.

Hardwood lumber, kiln dried, large variety of species in several thicknesses and grades. We also carry figured woods and carving stock. No minimum order, size selection and quantity discounts available. Call or send 2 stamps for listing. Garreson Lumber, 7201-B Craig Road, Bath, NY 14810; (607) 566-8558.

## MISCELLANEOUS

Lowest prices on crafting supplies, plugs, dowels. Special 1/2 in. maple buttons \$2.90 per 100, ppd. Toy parts, shaker and mug pegs, more. Woodcrafter Plus, 4810 NE 14th Place, Ocala, FL 32670.

Custom Turning—Have turnings made to your exact specifications. Furniture reproduction, porch railings and stairway balusters a specialty. For free brochure send to: River Bend Turnings, Box 364, Dept. WJ, RD #1 River Road, Wellsville, NY 14895.

Custom Glass Fabricator. We will make glass panels and shelves for all types of door and cabinets. Machine and hand beveling is our specialty. Brochure \$1.00 (credited). Campbell Glass Shop, 8444 Melrose Ave., Los Angeles, CA 90069; (213) 653-0647.

Professional Stained Glass Supplies. Learn fascinating craft! Catalog \$2.00 with free bonus coupons, instruction booklet. Whittemore, Box 2065MQ, Hanover, MA 02339.

Post Office Box Bronze Doors No. 1 \$5.50, No. 2 \$6.50, No. 3 \$9.00 each. Add \$1.00 each shipping. Send SASE for additional information to: Hubbert Woodcrafts, P.O. Box 1415, Fletcher, NC 28732; (704) 687-0350.

PC Software, Comprehensive Index, 11 woodworking magazines, 289 issues, 6500 articles. Satisfaction guaranteed! \$44.95. Infodex Services, Dept. 4105, 10609 King Arthurs, Richmond, VA 23235-3840. Free information.

Branding Irons—Custom, hand-held or drill press. Brochure \$1.00. Engraving Arts, P.O. Box 787W, Laytonville, CA 95454; (707) 984-8203.

Let The Government Finance your woodworking-related small business. Grants/loans to \$500,000. Free recorded message: (707) 449-8600. (KX9)

Spray-On Suede. Free brochure, sample enclosed. DonJer Products, Ilene Court, Bldg. 8R, Bellemead, NJ 08502; 1-800-336-6537.

Booksafes! Turn ordinary books into secret hiding places. Make marvelous gifts. \$7.50. WaltWorks-III, 7 White Oak Road, Asheville, NC 28803.

## MUSICAL INSTRUMENTS

Musical Instrument Kits—dulcimers, hammered dulcimers, banjos, mandolins, and more. Color brochure 85¢ stamp. Folkcraft Instruments, Box 807-K, Winsted, CT 06098; (203) 379-9857.

Guitar, Banjo, Mandolin, Violin and Dulcimer Building Materials. Finishing supplies. Free 104 page catalog. Guitar Shop Supply, Box 900Y, Athens, OH 45701; 1-800-848-2273.

## PLANS

Full-size woodworking patterns. Small projects. \$7.95+ \$1.00 shipping. Vic-Tim's CutOuts, 500 Melissa Court, Gahanna, OH 43230.

Designer Gazebo Birdfeeders: sell for \$175 in shops. Send \$1.00 for details, picture. WaltWorks-III, 7 White Oak Road, Asheville, NC 28803.

Cliff's Outdoor Furniture, 494 Annaquackett Road, N. Kingstown, RI 02852. Plan & picture catalog \$2.00.

Brighten Your Landscape. Charming, wooden post lamp plans. Send \$7.95 to: JR Plans, HCR63, Box 7, West Dover, VT 05356.

Compact Disc/VCR Tape Racks—2 designs! Complete plans and instructions. Large capacity. Simple dowel construction. \$4.00. Buff's Woods, Box 382, Ironia, NJ 07845.

Outdoor Furniture Plans—16 Original designs. Photo catalog \$2.00 (credited). Plancraft®, Box H1779, Hernando, FL 32642.

Library Chair/Ladder—Full size pattern with easy to follow instructions, \$8.95. California Import/Export, 621 Porter, Fullerton, CA 92632.

Build Lawn/Patio Furniture, workbench and more. Catalog \$1.00. LLE, Box 908WB, Cornville, AZ 86325.

Easy detailed plans for six sided picnic table. Send \$7.95 to Box 10, Dundas, IL 62425.

## TOY PARTS

Exciting Wooden Toy Plans. Plans for eye-catching toys with super realistic wheels described in free catalog. ToyPrO, Dept. WJ, P.O. Box 773810, Steamboat Springs, CO 80477.

Astonishing Wooden Toys Perform "Balancing" Stunts! Easy patterns! Free details! Pleasure Crafts, WJ7B, RT2-1485, Mannford, OK 74044.

Full-size wooden toy patterns, cars, trucks, robot, space vehicles, humorous whirligigs. Catalog \$1.00. Yesteryear Toy Shop, RD #1, Knox, PA 16232.

## INDEX TO ADVERTISERS

|                               |    |
|-------------------------------|----|
| Accent Furniture Design . . . | 64 |
| Accents In Pine . . . . .     | 65 |
| Airstream Dust Helmets . . .  | 64 |
| Bilnor Enterprises . . . . .  | 64 |
| Bruss Fasteners . . . . .     | 11 |
| Chem-Tech, Inc. . . . .       | 65 |
| Clark National Products . . . | 5  |
| Crafter's Mart . . . . .      | 11 |
| Eagle America . . . . .       | 8  |

|                                 |    |
|---------------------------------|----|
| Econ Abrasives . . . . .        | 11 |
| F & B Associates . . . . .      | 65 |
| Floral Glass & Mirror . . . .   | 12 |
| Furniture Designs, Inc. . . . . | 65 |
| Heartwood Furniture . . . . .   | 64 |
| Homecraft Veneer . . . . .      | 64 |
| Howard Carol Chairs, Inc. . .   | 65 |
| Laguna Tools . . . . .          | 11 |
| Madrigal Publishing . . . . .   | 12 |
| Meisel Hardware . . . . .       | 14 |

|                                 |    |
|---------------------------------|----|
| Minuteman, Inc. . . . .         | 65 |
| MLCS . . . . .                  | 9  |
| Morrison Originals . . . . .    | 65 |
| Nova Tool Company . . . . .     | 13 |
| Paxton Hardware . . . . .       | 64 |
| Penn State Industries . . . . . | 6  |
| Plancraft . . . . .             | 64 |
| Quaker State                    |    |
| Woodworking Supplies . . . .    | 7  |
| Quality Concepts . . . . .      | 64 |

|                                |    |
|--------------------------------|----|
| Record Tools, Inc. . . . .     | 8  |
| Skil Corporation . . . . .     | 2  |
| Specialty Furniture . . . . .  | 64 |
| Trend-lines . . . . .          | 14 |
| Wetzler Clamp Co., Inc. . . .  | 64 |
| Woodfinisher's Pride . . . . . | 13 |
| Wood-Mizer Products . . . . .  | 64 |
| Wooden Playground . . . . .    | 64 |
| Woodworker's Hardware . . .    | 12 |
| Woodworks . . . . .            | 17 |

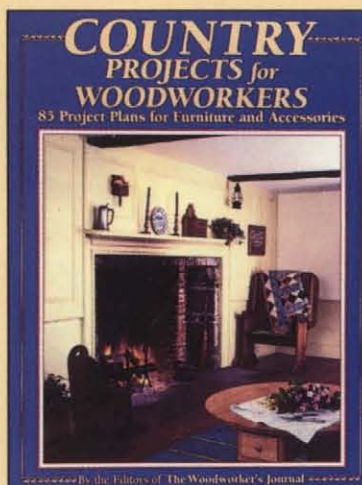


# BOOKS

from

## *The Woodworker's Journal*

You'll find the order form for these books bound in this issue — or for faster service call toll-free 1-800-223-2425!



### Country Projects For Woodworkers

If building the simple, sturdy furniture of the old cabinetmakers appeals to you, then you'll want this collection of country projects from the 1980-84 issues of *The Woodworker's Journal*. 85 complete plans range from projects like Colonial Candlesticks and Fireplace Bellows to more challenging projects such as a Shaker Chest, a Stepped-Back Hutch, and an 18th Century Trestle Table. Some plans are also in *Projects for Woodworkers*, Volumes 1 and 2.

### The WOODWORKER'S PROJECT BOOK

42 shop-tested plans for easy-to-make gifts, toys & furniture



**NEW BOOK!**

#### The Woodworker's Project Book

Our first full-color book, these are 42 of our very best, easy-to-make projects. Gleaned from the 1988 issues of *The Woodworker's Journal*, projects include folk-art silhouettes, lamps, pierced-tin cabinets, toys, furniture, decorative woodcrafts, gifts and accessories. Full-size patterns, step-by-step instructions, 74 photos, and over 265 illustrations.

### Projects for Woodworkers

75 Project Plans for Furniture, Toys, and Accessories

Volume 1



### Projects For Woodworkers, Volume 1

Beginning and advanced woodworkers alike will appreciate the full range of styles in furniture, accessories, lamps, clocks, toys and gifts. Of the 75 projects selected from the 1980-81 issues of *The Woodworker's Journal* magazine, plans include a Cabinetmaker's Workbench, Pine Shaker Cupboard, Old-time Icebox, a Cobbler's Bench Coffee Table and a Child's Victorian Sled. Fully detailed instructions, illustrations, and photos.

### WEEKEND PROJECTS for WOODWORKERS

52 great projects you can build in a day or two



#### Weekend Projects For Woodworkers

This is the book for the craftsman long on enthusiasm and short on time. Selected from the 1986-87 issues of *The Woodworker's Journal*, all 52 projects are quick, easy and attractive. Each plan is presented clearly with fully detailed instructions and drawings. Whether scrambling for a break or enjoying lots of spare time, woodworkers of all skill levels will appreciate the satisfaction of seeing a project through to completion in just an evening or weekend.

### Projects for Woodworkers

60 Project Plans for Furniture, Toys, and Accessories

Volume 2



### Projects For Woodworkers, Volume 2

Originally published in the 1982 issues of *The Woodworker's Journal* magazine, all 60 projects were chosen with a variety of styles and skill levels in mind. Each project has complete instructions and illustrations. You'll find household accessories like the Desk Caddy, Casserole Dish Holder, and Breakfast Tray easy to build. And you're sure to enjoy completing more involved projects like the Tambour Desk, Old Danish Chest of Drawers and Swinging Cradle.

### WOODCARVING WITH RICK BÜTZ

By RICK and ELLEN BÜTZ



#### Woodcarving With Rick Butz

With just a few tools and a few hours to spare, you can share in the pleasures of carving. Wander into the Black Forest of Germany with a carving of St. Nick, or into a Russian village with a Dancing Bears folk toy. Enjoy a chip-carved Quilt Rack, wildlife carvings, and a Tobacconist's Indian. All 14 projects are fully detailed with step-by-step photos. There are chapters on tool selection, sharpening, whittling, chip and relief carving.

### Projects for Woodworkers

60 Project Plans for Furniture, Toys, and Accessories

Volume 3

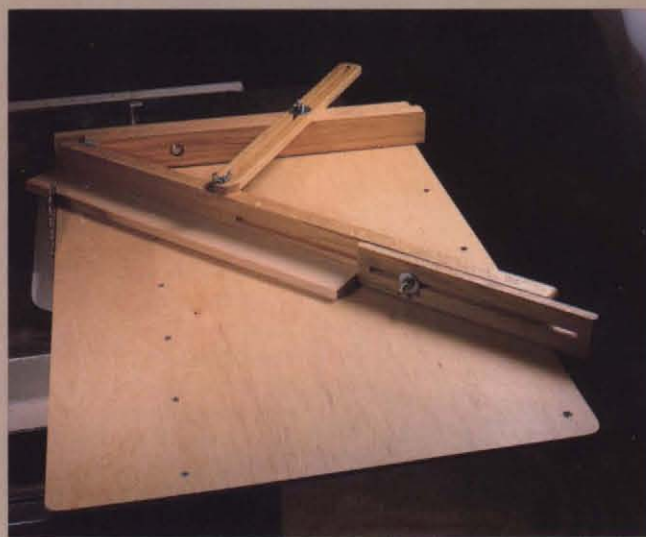


### Projects For Woodworkers, Volume 3

The best projects from the 1983 issues of *The Woodworkers Journal* magazine—toys, lamps, cupboards, chests, cabinets, tables, planters, mirrors, and much more. Clear illustrations and thorough written instructions make each project easy-to-understand and fun to build. A book you'll want to keep within easy reach of your workbench.



# Next Issue . . .



The September/October issue is shaping up to be something very special. The classic Early American Hutch is a favorite that's never out of style, and it's an easy build from no. 2 pine.

For the kids, the Sink & Stove Combo is much more than a center for make-believe play. With ample storage below the sink, and in the oven and drawer, it doubles as a toy organizer.

There's a group of turning projects, including Pocket Mirrors and Yo-Yo's, from master turner Nick Cook, plus a clever Cutoff/Miter/Taper Jig to help you get more from your table saw.

And there are four more projects, among them the much requested Step Stool/Chair and some easy-to-make Bookshelves, plus four great features, including a review of the new benchtop table saws, a vacuum turning techniques article, and a step-by-step introduction to chairbuilding.

We're sure this next issue will be everything that you expect—and more!