SANDBLASTING
Tested ways to dress up projects

BIRCH-BARK CANOES
Jack Minehart shows how to build them

TOOL SPECIAL
• Planers under $500
• Thin-kerf saw blades
• Scrollsaw blades

SUPER PROJECTS
Tablesaw base
Sandblasted clock
Bowed psaltery
Hummingbird sculpture
Carved bluegill

DOLLHOUSE IN A BOX
See page 46

Better Homes and Gardens WOOD
THE #1 MAGAZINE FOR HOME WOODWORKERS
APRIL 1990 • ISSUE NO. 34
Display until April 12

Can. $4.95

1400514072
Surround yourself with the best!

6" x 47" HEAVY DUTY JOINTER
MOBILE BASE MODEL G1744
ONLY $195.00
F.O.B. Bellingham, WA or Williamsport, PA

10" SUPER HEAVY DUTY TABLE SAW
MODEL G1023
REG. $375.00
SALE PRICE $345.00
F.O.B. Bellingham, WA or Williamsport, PA

10" HEAVY DUTY TABLE SAW
MODEL G1022
REG. $365.00
SALE PRICE $355.00
F.O.B. Bellingham, WA or Williamsport, PA

6" x 48" COMBINATION SANDERS
MODEL G1014
9" Disc
Sanding belts & disks available
ONLY $195.00
F.O.B. Bellingham, WA or Williamsport, PA

WOOD SHAPER
Perfect for custom work!
MODEL G1024
REG. $275.00
SALE PRICE $245.00
F.O.B. Bellingham, WA or Williamsport, PA

MOBILE BASE MODEL G1746
ONLY $89.95

2 H.P. DUST COLLECTORS
MODEL G1029
REG. $350.00
SALE PRICE $295.00
F.O.B. Bellingham, WA or Williamsport, PA

MOBILE BASE MODEL G1748
ONLY $89.95

6" x 30" EDGE Sander
MODEL G1531
FOR A SMOOTH PRECISE FINISH!
ONLY $395.00
F.O.B. Bellingham, WA or Williamsport, PA

16" BAND SAW
MODEL G1538
REG. $525.00
SALE PRICE $495.00
F.O.B. Bellingham, WA or Williamsport, PA

"1" blade capacity makes re-sawing a pleasure!
MOBILE BASE
MODEL G1742
ONLY $89.95

INCRA GAUGE
Invaluable tool for setting up router bits, table saws, where fine measurements are needed!
MODEL G1823
ONLY $12.95

CARBIDE-TIPPED SAW BLADES

<table>
<thead>
<tr>
<th>MODEL</th>
<th>BLADE SIZE</th>
<th>NO. OF TEETH</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>G1239</td>
<td>7/4</td>
<td>24</td>
<td>$11.95</td>
</tr>
<tr>
<td>G1240</td>
<td>7/4</td>
<td>40</td>
<td>$13.95</td>
</tr>
<tr>
<td>G1241</td>
<td>8&quot;</td>
<td>24</td>
<td>$25.50</td>
</tr>
<tr>
<td>G1242</td>
<td>8&quot;</td>
<td>40</td>
<td>$31.50</td>
</tr>
</tbody>
</table>

At these prices you can't go wrong!

INCRA JIG
MODEL G1766
AMAZING!
ONLY $28.95

Our warehouse is bursting with tools! Ask for our free catalog.

CALL TOLL FREE:

EAST OF THE MISSISSIPPI:
1-800-523-GRRRR
(Orders & Catalog Requests Only)
717-326-3806 (Inquiries & Customer Service)

WEST OF THE MISSISSIPPI:
1-800-541-5537
(Orders & Catalog Requests Only)
206-647-0801 (Inquiries & Customer Service)
Buy 1 tool and get our 212 page tool free.

Here are just a few of the 3,500 unique woodworking tools available from our most versatile tool, the 1990 Garrett Wade Catalog.
The 212 page Catalog, regularly $4.00, is Free with any order from this ad. Or if you would just like the Catalog, send us $4.00 with your name and address. This is the one woodworking source book you shouldn’t be without.

A / Our 202GF Gap Filling Glue Has Remarkable Properties
It has a very high solids content so that small gaps in joinery are actually filled with strength. And the “squeeze-out” beads right up and chips off when dry. No soaking in to ruin finishes. Dries to a light tan. Water clean-up.

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>62J01.01</td>
<td>1 pt. 202GF</td>
<td>$6.50</td>
</tr>
<tr>
<td>62J01.03</td>
<td>1 qt. 202GF</td>
<td>$11.50</td>
</tr>
</tbody>
</table>

B / Band Saw Handbook by Mark Duginske
An invaluable bench reference for any woodworker. Learn what makes your bandsaw tick. Tune-up and maintenance; blade selection, tracking and tensioning; plus cutting methods for various woods and other materials. Hundreds of tips and shortcuts. Unlock your saw’s potential.

16D04.02 Band Saw Handbook $16.95

C / Garrett Wade Has Discovered Some Very Interesting Bandsaw Blades

<table>
<thead>
<tr>
<th>Blade Type</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>3/8” “Super Narrow” Blades</td>
<td>May you have never seen a blade like this. A 24° bevel style, it produces smooth cuts while making incredibly tight turns. We strongly recommend using our “Cool Blocks” with these delicate blades, because they can be set closer to the blade without danger of overheating.</td>
<td></td>
</tr>
<tr>
<td>3/32” Blades (Delta 14” and copies)</td>
<td>$14.75</td>
<td></td>
</tr>
<tr>
<td>33K11.01</td>
<td>1/4” Scroll</td>
<td>$14.75</td>
</tr>
<tr>
<td>33K11.02</td>
<td>1/4” (20tpi) Cabinet</td>
<td>$10.80</td>
</tr>
<tr>
<td>33K11.03</td>
<td>1/4” (20tpi) Cabinet</td>
<td>$11.75</td>
</tr>
<tr>
<td>33K12.01</td>
<td>1/8” Scroll</td>
<td>$13.50</td>
</tr>
<tr>
<td>33K12.02</td>
<td>1/8” Cabinet</td>
<td>$10.00</td>
</tr>
<tr>
<td>33K12.03</td>
<td>1/8” Cabinet</td>
<td>$10.75</td>
</tr>
<tr>
<td>72” Blades (Shopsmith Saws)</td>
<td>$12.20</td>
<td></td>
</tr>
<tr>
<td>33K13.01</td>
<td>1/6” Scroll</td>
<td>$9.95</td>
</tr>
<tr>
<td>33K13.02</td>
<td>1/6” Cabinet</td>
<td>$9.40</td>
</tr>
<tr>
<td>33K13.03</td>
<td>1/6” Cabinet</td>
<td>$9.95</td>
</tr>
<tr>
<td>73” Blades (Inca 10½”)</td>
<td>$12.80</td>
<td></td>
</tr>
<tr>
<td>310.160</td>
<td>1/6” Scroll</td>
<td>$9.70</td>
</tr>
<tr>
<td>310.161</td>
<td>1/6” Cabinet</td>
<td>$10.30</td>
</tr>
<tr>
<td>310.162</td>
<td>1/6” Cabinet</td>
<td>$10.30</td>
</tr>
<tr>
<td>104” Blades (Delta w/Riser and Inca 20”)</td>
<td>$16.00</td>
<td></td>
</tr>
<tr>
<td>710.101</td>
<td>1/6” Scroll</td>
<td>$11.95</td>
</tr>
<tr>
<td>710.201</td>
<td>1/6” Cabinet</td>
<td>$11.95</td>
</tr>
<tr>
<td>710.202</td>
<td>1/6” Cabinet</td>
<td>$12.90</td>
</tr>
</tbody>
</table>

D / Special Bandsaw “Cool Blocks” Prolong Blade Life And Increase Accuracy
Made of a special Graphite impregnated Phenolic Laminate, this set of 4 replaces your upper and lower side blade guides.
Cool Blocks run cooler and are more “slippery” than conventional steel guides. Since they can be set actually touching the blade, they give you better control of the cut. Sure to improve the performance of whatever bandsaw you use.

Model

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>33K09.01</td>
<td>&quot;A&quot; Delta 14”</td>
<td>$11.95</td>
</tr>
<tr>
<td>33K09.02</td>
<td>&quot;B&quot; Sears 12”</td>
<td>$11.95</td>
</tr>
<tr>
<td>33K09.03</td>
<td>&quot;C&quot; Inca 10½”</td>
<td>$11.95</td>
</tr>
<tr>
<td>33K09.04</td>
<td>&quot;D&quot; Shopsmith</td>
<td>$11.95</td>
</tr>
<tr>
<td>33K09.05</td>
<td>&quot;E&quot; Old Sears (1/4” Rd.)</td>
<td>$11.95</td>
</tr>
<tr>
<td>33K09.06</td>
<td>&quot;F&quot; Jet 14” (firs Delta copies)</td>
<td>$11.95</td>
</tr>
<tr>
<td>33K09.07</td>
<td>&quot;G&quot; Gilliom (1/4” Rd.)</td>
<td>$11.95</td>
</tr>
<tr>
<td>33K09.08</td>
<td>&quot;H&quot; Delta 16”</td>
<td>$11.95</td>
</tr>
</tbody>
</table>

E / The “Blind Nailer” Used To Be A Staple In Every Finish Carpenter’s Tool Box
This unique tool allows you to set nails or brads invisibly. Slip the special chisel, with its finger nail shaped cutting edge, into the positioning jig and tighten the clamping screw. Place the flat sole on the wood and strike the end of the chisel with a firm tap with the palm of your hand. The Blind Nailer will lift a perfect small chip from the surface. Hammer your nail or brad in and then glue the chip back in place.

44K01.03 Blind Nailer $14.95

---

Garrett Wade Co., Inc.
161 Avenue of the Americas
New York, NY 10013 Dept. 105

Call Toll Free 800-221-2942
NY 212-807-1757 No Collect Calls Please

Please send me these Garrett Wade tools and include a FREE 1990 Catalog with my order. (Prices good until September 14, 1990)

Name: ____________________________
Address: __________________________
City: ____________________________ State: __________ Zip: __________

☐ Check or Money Order: __________ Card Number: __________
☐ Visa or MasterCard: __________
☐ American Express: __________
Expiration Date: __________

<table>
<thead>
<tr>
<th>STOCK #</th>
<th>QTY</th>
<th>DESCRIPTION</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>GW 1</td>
<td>1</td>
<td>1990 Catalog (free with order from this ad)</td>
<td>$4   00</td>
</tr>
</tbody>
</table>

New York Residents add applicable Sales Tax
Shipping & Handling: $2.90 for order total up to $10
$4.10 for $10.01 to $20
$4.95 for $20.01 to $50
$6.25 for over $50

Sub Total
Sales Tax
Shipping
Grand Total
We'll take it. Your old fence. In trade for the ultimate saw guide. The Delta Unifence® Saw Guide. And depending on which Unifence you buy (30", 52" and 96" capacity models), we'll give you $25, $45 or $75 for your old clunker.

The Unifence is unmatched for accuracy, versatility and performance. Its exclusive dual English/metric scale makes set-ups to 1/64" (5mm) quick and easy.

Its unique fence body slides back and forth across the cutting area and locks in place. So you can make fast repetitive cut-offs, do precision ripping or cut large panels, including laminated stock.

The Unifence will work with just about any 10" table saw you own. Big difference is, it will work better. Which means, so will you.

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

Better Homes and Gardens®
WOOD
THE #1 MAGAZINE FOR HOME WOODWORKERS
April 1990 • Vol. 7, No. 2 • Issue No. 34
Editorial/Art Staff
Editor LARRY CLAYTON
Managing Editor CARL VOSS
Art Director C. L. BATEKE
Design Editor JAMES R. BOWLING
Features Editor PETER J. STEPHANO
How-To Editor MARLEN KEMMET
Products/Techniques Editor BILL KRIER
Project Builder JAMES E. BOELLING
Senior Graphic Designer PERRY A. MCCARL
Administrative Assistant DARLENE REYNOLDS
Business Office Clerk MARGARET CLOUSER
Technical Consultants: Product Testing GEORGE GRANSEN; Products that Perform STEVE OSWALD; Wood Technology PAUL L. MCCURRY; Collectible Tools PHILIP WHITBY
Publisher WILLIAM R. REED
Advertising Representatives MARK S. JOSEPHSON, NEIL A. ONNE, CHRIS W. SCHRAF
Promotion/Research Directors THOMAS R. TROLAND
Marketing Research Manager EILEEN SULLIVAN
Marketing Services Manager NANCY DALLY
Marketing Services Assistant CORINNE OLESON
Sales Secretary LORIANN DeCICCOPO
Circulation Director CLEM SEVDE; Circulation Manager ALAN BRUSH; Newsstand Circulation Director MICHAEL SENIOR
Production Director ROBERT C. FORSTENAU
Editorial Research Director C. RAY TEATON
Public Relations CYNTHIA ADAMS

Magazine Group Officers
Group President JAMES A. AUTRY
Senior Vice President, Publishing Director ADOLPH AUBERT"
# Carbohydrate Router Bits and Shaper Cutters, Industrial Quality at Discount Price

New Complete Range Free Catalog Available On Request

<table>
<thead>
<tr>
<th>CUTTER</th>
<th>ORDER#</th>
<th>CUT DIA</th>
<th>CUT L</th>
<th>SH DIA</th>
<th>PRICE $</th>
</tr>
</thead>
<tbody>
<tr>
<td>ST206</td>
<td>1/4</td>
<td>3/4</td>
<td>1/4</td>
<td>5.50</td>
<td></td>
</tr>
<tr>
<td>ST210</td>
<td>3/8</td>
<td>1</td>
<td>1/4</td>
<td>5.50</td>
<td></td>
</tr>
<tr>
<td>ST213</td>
<td>1/2</td>
<td>1</td>
<td>1/4</td>
<td>5.50</td>
<td></td>
</tr>
<tr>
<td>ST413E</td>
<td>1/2</td>
<td>2/2</td>
<td>1/2</td>
<td>14.00</td>
<td></td>
</tr>
<tr>
<td>ST216</td>
<td>5/6</td>
<td>1</td>
<td>1/4</td>
<td>5.90</td>
<td></td>
</tr>
<tr>
<td>ST219</td>
<td>3/4</td>
<td>1</td>
<td>1/4</td>
<td>8.50</td>
<td></td>
</tr>
<tr>
<td>ST425</td>
<td>1</td>
<td>1 1/16</td>
<td>1/2</td>
<td>6.80</td>
<td></td>
</tr>
<tr>
<td>FT210</td>
<td>3/8</td>
<td>1</td>
<td>1/4</td>
<td>6.50</td>
<td></td>
</tr>
<tr>
<td>FT213</td>
<td>1/2</td>
<td>1</td>
<td>1/4</td>
<td>6.50</td>
<td></td>
</tr>
<tr>
<td>FT413</td>
<td>1/2</td>
<td>1 1/16</td>
<td>1/2</td>
<td>6.50</td>
<td>ROMAN OGEE</td>
</tr>
<tr>
<td>DV210</td>
<td>3/8</td>
<td>3/8</td>
<td>1/4</td>
<td>4.60</td>
<td></td>
</tr>
<tr>
<td>DV213</td>
<td>1/2</td>
<td>1 1/2</td>
<td>1/2</td>
<td>4.60</td>
<td></td>
</tr>
<tr>
<td>DV413</td>
<td>1/2</td>
<td>1 1/2</td>
<td>1/2</td>
<td>4.60</td>
<td></td>
</tr>
<tr>
<td>DV419</td>
<td>3/4</td>
<td>7/8</td>
<td>1/2</td>
<td>6.50</td>
<td></td>
</tr>
<tr>
<td>DV425</td>
<td>1</td>
<td>7/8</td>
<td>1/2</td>
<td>7.50</td>
<td></td>
</tr>
<tr>
<td>CB206</td>
<td>1/4</td>
<td>1 1/4</td>
<td>1/4</td>
<td>8.00</td>
<td></td>
</tr>
<tr>
<td>CB210</td>
<td>3/8</td>
<td>5 1/16</td>
<td>1/4</td>
<td>9.00</td>
<td></td>
</tr>
<tr>
<td>CB213</td>
<td>1/2</td>
<td>3 1/8</td>
<td>1/4</td>
<td>11.00</td>
<td></td>
</tr>
<tr>
<td>CB219</td>
<td>3/4</td>
<td>1 1/2</td>
<td>1/2</td>
<td>14.00</td>
<td></td>
</tr>
<tr>
<td>CB425</td>
<td>1</td>
<td>5/8</td>
<td>1/2</td>
<td>16.00</td>
<td></td>
</tr>
<tr>
<td>CH216</td>
<td>1 1/4</td>
<td>5/8</td>
<td>1/2</td>
<td>13.00</td>
<td></td>
</tr>
<tr>
<td>CH422</td>
<td>1 1/4</td>
<td>7/8</td>
<td>1/2</td>
<td>18.00</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>CUTTER</th>
<th>ORDER#</th>
<th>R</th>
<th>CUT L</th>
<th>SH DIA</th>
<th>PRICE $</th>
</tr>
</thead>
<tbody>
<tr>
<td>CR203</td>
<td>1/8</td>
<td>3/8</td>
<td>1/4</td>
<td>10.00</td>
<td></td>
</tr>
<tr>
<td>CR205</td>
<td>3/16</td>
<td>7/16</td>
<td>1/4</td>
<td>10.00</td>
<td></td>
</tr>
<tr>
<td>CR206</td>
<td>1/4</td>
<td>1/2</td>
<td>1/4</td>
<td>12.00</td>
<td></td>
</tr>
<tr>
<td>CR210</td>
<td>3/8</td>
<td>5/8</td>
<td>1/4</td>
<td>14.00</td>
<td></td>
</tr>
<tr>
<td>CR213</td>
<td>1/2</td>
<td>3/4</td>
<td>1/4</td>
<td>16.00</td>
<td></td>
</tr>
<tr>
<td>CR419</td>
<td>3/4</td>
<td>1</td>
<td>1/2</td>
<td>20.00</td>
<td></td>
</tr>
<tr>
<td>CR425</td>
<td>1</td>
<td>1 1/4</td>
<td>1/2</td>
<td>32.00</td>
<td></td>
</tr>
<tr>
<td>RO204</td>
<td>5/32</td>
<td>15/32</td>
<td>1/4</td>
<td>15.00</td>
<td></td>
</tr>
<tr>
<td>RO205</td>
<td>1/4</td>
<td>3/4</td>
<td>1/2</td>
<td>16.00</td>
<td></td>
</tr>
<tr>
<td>RO406</td>
<td>1/4</td>
<td>3/4</td>
<td>1/2</td>
<td>16.00</td>
<td></td>
</tr>
<tr>
<td>CV203</td>
<td>1/8</td>
<td>3/8</td>
<td>1/4</td>
<td>11.00</td>
<td></td>
</tr>
<tr>
<td>CV206</td>
<td>1/4</td>
<td>1/2</td>
<td>1/4</td>
<td>11.00</td>
<td></td>
</tr>
<tr>
<td>CV213</td>
<td>1/2</td>
<td>5/8</td>
<td>1/4</td>
<td>13.00</td>
<td></td>
</tr>
<tr>
<td>CV419</td>
<td>3/4</td>
<td>3/4</td>
<td>1/2</td>
<td>25.00</td>
<td></td>
</tr>
<tr>
<td>CS206</td>
<td>1/4</td>
<td>5/8</td>
<td>1/4</td>
<td>19.00</td>
<td></td>
</tr>
<tr>
<td>CS406</td>
<td>1/4</td>
<td>5/8</td>
<td>1/2</td>
<td>19.00</td>
<td></td>
</tr>
<tr>
<td>CL203</td>
<td>1 1/4</td>
<td>1 1/4</td>
<td>1/4</td>
<td>9.00</td>
<td></td>
</tr>
<tr>
<td>CL206</td>
<td>1 1/4</td>
<td>1 1/4</td>
<td>1/4</td>
<td>10.00</td>
<td></td>
</tr>
<tr>
<td>SL210</td>
<td>1/4</td>
<td>3/4</td>
<td>1/2</td>
<td>11.00</td>
<td></td>
</tr>
<tr>
<td>SL410</td>
<td>1/4</td>
<td>3/8</td>
<td>1/2</td>
<td>12.00</td>
<td></td>
</tr>
</tbody>
</table>

**ORDER #C985**
- Panel Raiser
- Price: $49.00

**3 Wing Shaper Cutters More Than 50 Items**
- 16" Scroll Saw
- Order #SS-16
- Price: $119.00

**Retail Value: $209.00**

**Nicholson**
- Top of the Line 6½"-10" 20T - 60T
- 10" x 60T
- Order # NIC 60938
- Price: $39.99
- Retail Value: $60.09

**Same Day Shipping**

AmMax Tools
12655 Danielson Court Suite 310, Poway CA 92064

TO ORDER BY MASTER CHARGE OR VISA CALL TOLL FREE
1-800-78 26629 (1-800-78 AMMAX)
7AM-5PM PACIFIC TIME MONDAY-FRIDAY, OR SEND CHECK TO
AMMAX TOOLS CO.
12655 DANIELSON COURT SUITE 310, POWAY CA 92064

Router RPM Controller
- Best Quality
- Compatible up to 3HP Router
- 115V 15Amp
- Adjustable from 0-Full Speed

**Price:** $159.00 Retail Value

**Free for any order over $200.00**
## Wood Profile

**Red Oak: From Men-of-War to Kitchen Cabinets, Always Number One**

In our first expanded coverage of wood species, we lay out a bundle of information about a favorite wood of cabinetmakers.

### Craftsman Close-Up

**Long Live the Bark Canoe!**

Features Editor Pete Stephano poked around Max, Minnesota, for a few days last summer to watch Jack Minehart build genuine birch-bark canoes. You'll see how Jack's caring process clings to historical craftsmanship.

### Shop-Tested Techniques

**Sandblasting—Try It Once and You'll Be Blown Away**

The research for this article really opened our eyes to an untapped area of woodworking. We'll bet dollars to doughnuts that most readers have no idea how easily they could sandblast interesting details into their projects.

### Now You Can Build It

**Sandblasted Wall Clock**

To mirror the versatility of your newly acquired techniques, here's a clock design that allows you lots of sandblasting variations.

### In Search of the Perfect Finish

**Water-Based Lacquers: The Safe Finish That Goes on Fast**

In suburban Chicago, a finisher breathes easier now that he has switched to water-based lacquer. It makes sense for the environment, too.

### Tool Buymanship

**Thin-Kerf Showdown**

You, too, may have noticed a lot of advertisements promoting 10" thin-kerf blades. Our tests show a wide variety in the quality of cuts.

---

### Woodworks

4500 Anderson Blvd.
Fort Worth, Texas 76117
(817) 281-4447
Dollhouse in a box 46
By designing a two-story house that collapses neatly into a carrying case, we've taken care of the #1 problem with a dollhouse—where to keep it when playtime ends. You'll get lots of requests to build this one.

Cumulative index: issues 25 through 32 49
You'll find it all easily in our pull-out, eight-issue index: projects, shop techniques, tool reviews, features, and more.

THE WOODWORKER'S SURVIVAL GUIDE TO BUYING...

Scrollsaw blades 56
Choosing the right scrollsaw blade perplexes many woodworkers. Here's information you need before placing your order.

Petal-powered sculpture 58
When we saw this hummingbird design at an Arkansas craft show, our entire staff agreed that it had all the makings of a perfect project for pattern-hungry scrollsaw users.

Customized tablesaw base 60
Our latest shop helper not only allows for dust evacuation, it also features storage nooks for your miter gauge, rip fence, saw blades, and push stick.

TOOL BUYMANSHP

Thickness planers under $500 64
Just a few years ago, thickness planers were too expensive for most woodworkers. Now, you can choose from less-expensive portable models.

The bowed psaltery 68
With the expert guidance of instrument makers from St. Croix Kits, we offer a stringed musical instrument with roots in the Renaissance.

CARVING PATTERN

Carve a bluegill 74
Wisconsin's Rick Beyer, who wins acclaim with his realistic fish carved from cherry, shares his design for one of the Heartland's favorite catches.

SHORT-SUBJECT FEATURES
Editor's Angle .............. 6  Air Compressor Tune-up .... 76
Talking Back .............. 8  Great Ideas from Our Shop .... 80
Tips from Your Shop (And Ours) .............. 16  Products That Perform .... 84  Tool-Industry Insider .... 92
Finishing Touches .............. 100

NOW! REDUCE THE RISK AT YOUR TABLE SAW

OUTFEED ROLLERS
- safe, accurate sawing
- handle panels with ease
- available in 15" and 37" widths
- dual-position table

AND INCREASE FLOOR SPACE
MOBILE MACHINE BASES
- increase shop working area
- maximize usable floor space
- 3 point base will not rock
- locking wheels
- makes machine so easy to use and store
- over 60 standard models

PLANER STAND WITH ROLLERS
- raises planer to proper working height
- provides machine mobility
- five-fold increase in workpiece support
- storage is a snap

ROLLERTABLE
Rock Solid Support
- adjustable
- portable
- use on any machine

Discover HTC's many unique products designed only with you, the dedicated woodworker in mind. Find out how you can make your machining safer, increase working area of your shop and accomplish nearly impossible tasks easily, quickly and accurately—all by yourself!

CALL TODAY!
HTC PRODUCTS, INC.
120 E. HUDSON S-B
ROYAL OAK, MI 48067
(313) 399-6185
1-800-624-2027 ext. 108
When the English naturalist Charles Darwin advanced the theory of evolution more than a century ago, he focused on man and animals, not publications. But I think he would nod in approval at what's happening with the new "Wood Profile" you'll find on page 27.

Because I'm responsible for this feature's production, Editor Larry Clayton asked me to explain what's going on. That's why—for this issue—I've taken over his column.

Magazines always undergo some change, and of course we've made changes to "Wood Profile" in the past. This time, though, we've pulled all the stops for an evolutionary leap, as shown above.

As you can see, we've altered the looks of this popular feature. And to help more in identification, we've included an up-close illustration of the tree's leaves—with blooms and nuts if they're pertinent. The whole tree is still there, but it's smaller to allow room for a map that shows where it grows. Nice, but nothing earthshaking. So turn (Surprise!) to the next page.

Starting with this issue, we've bumped "Wood Profile" up to two pages. On the second page, you'll learn more about how the featured species reacts in the shop. From planing and gluing to carving, turning, and finishing, we've tapped the experience of several experts. And, although we will be covering in the new, expanded way some old favorite woods we've included before, you can expect to see some new species, too. Even if you've been working wood for 20 years or more, we trust there's a new tip or two to pass on to you. Our goal is to improve your woodworking skills. That's what evolution does, you know—improve things.
FREE 24 pg. Color Catalog

Wood Shaper
- 1/2" Spindle
- 1 hp
- Cast iron construction
- Precision fence
- 160 lbs
- Ball bearings
Reg. $499.00
List $259.00
(ships freight collect)

12" Thickness Planer
- Depth of cut 1/4"
- Feed rate 26 fpm
- 69 lbs
- Safety Switch
- All ball bearing
Reg. $359.00
Call Toll Free 1-800-845-9356 or in S.C.
List $1315
$915
(Shp. & Hdlg. '20.00)

14" Bandsaw
- Blade size up to 3/4" wide
- Cast iron construction
- 180 lbs
- 3-1/2 hp
$259.00
(ships freight collect)

Industrial Dust Collector
- 2 hp, 110v
- Two 4" inlets
- 1185 CFM
- 125 lbs
Reg. $499.00
Value $339.00
(ships freight collect)

6" Long Bed Jointer
- 3/4 hp, 110v
- Fence fits 45" both ways
- Fully adjustable
- 190 lbs
Reg. $499.00
List $299.00
(ships freight collect)

6" Belt & 9" Disc Sander
- 3/4 hp
- 6" x 48" belt
- Cast iron construction
- 152 lbs
- 9" Sanding Disc Included
- Ball Bearings
Reg. $349.00
$209.00
(ships freight collect)

40" Wood Lathe
- 1/4 hp
- Var. Speed 560-3200 rpm
- 290 lbs
- Cast iron construction
List $615.00
(ships freight collect)

In less than a minute The Total Shop Multipurpose machine can be converted into:
- Disc Sander
- 34" Lathe
- Overhead Pin Router
- 16½" Drill Press
- 10" Table Saw
The Total Shop multi-purpose machine is strong, precise and versatile, not to mention priced so that owning your own woodworking shop is a real possibility and not a problem.

1 Hour Video Brochure

□ YES! Please send me your free 24 page catalog.
□ YES! Please send me your 1 hour video brochure.
(Enclose 10.00 refundable deposit - specify VHS or DE)
CASCADe TOOLS, INC.
P.O. Box 3110, Bellingham, WA 98227
Finest Quality Carbide Tipped Router Bits & Shaper Cutters

RABBETING

CORNER ROUND

<table>
<thead>
<tr>
<th>SIZE</th>
<th>PART NO.</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot; Straight</td>
<td>C2030</td>
<td>$24.95</td>
</tr>
<tr>
<td>3/8&quot; Straight</td>
<td>C2032</td>
<td>$24.95</td>
</tr>
<tr>
<td>1/2&quot; Straight</td>
<td>C2033</td>
<td>$24.95</td>
</tr>
<tr>
<td>3/4&quot; Straight</td>
<td>C2034</td>
<td>$24.95</td>
</tr>
<tr>
<td>1&quot; Straight</td>
<td>C2035</td>
<td>$34.95</td>
</tr>
<tr>
<td>1-1/2&quot; Straight</td>
<td>C2036</td>
<td>$34.95</td>
</tr>
<tr>
<td>2&quot; Straight</td>
<td>C2038</td>
<td>$59.95</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIZE</th>
<th>PART NO.</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot; Radius</td>
<td>C2093</td>
<td>$24.95</td>
</tr>
<tr>
<td>3/8&quot; Radius</td>
<td>C2094</td>
<td>$24.95</td>
</tr>
<tr>
<td>1/2&quot; Radius</td>
<td>C2095</td>
<td>$26.95</td>
</tr>
<tr>
<td>3/4&quot; Radius</td>
<td>C2096</td>
<td>$26.95</td>
</tr>
<tr>
<td>1&quot; Radius</td>
<td>C2097</td>
<td>$49.95</td>
</tr>
<tr>
<td>1-1/4&quot; Radius</td>
<td>C2098</td>
<td>$49.95</td>
</tr>
</tbody>
</table>

FLUTE

BEAD

<table>
<thead>
<tr>
<th>SIZE</th>
<th>PART NO.</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot; Flute</td>
<td>C2040</td>
<td>$24.95</td>
</tr>
<tr>
<td>3/8&quot; Flute</td>
<td>C2041</td>
<td>$24.95</td>
</tr>
<tr>
<td>1/2&quot; Flute</td>
<td>C2042</td>
<td>$24.95</td>
</tr>
<tr>
<td>3/4&quot; Flute</td>
<td>C2043</td>
<td>$32.95</td>
</tr>
<tr>
<td>1&quot; Flute</td>
<td>C2045</td>
<td>$35.95</td>
</tr>
</tbody>
</table>

DOUBLE-FLUTED

BEADING

<table>
<thead>
<tr>
<th>SIZE</th>
<th>PART NO.</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot; Shank</td>
<td>C1017</td>
<td>$6</td>
</tr>
<tr>
<td>1/4&quot; Shank</td>
<td>C1158</td>
<td>$11</td>
</tr>
<tr>
<td>1/4&quot; Shank</td>
<td>C1159</td>
<td>$11</td>
</tr>
<tr>
<td>1/4&quot; Shank</td>
<td>C1160</td>
<td>$12</td>
</tr>
<tr>
<td>1/4&quot; Shank</td>
<td>C1161</td>
<td>$12</td>
</tr>
<tr>
<td>1/4&quot; Shank</td>
<td>C1162</td>
<td>$12</td>
</tr>
<tr>
<td>1/4&quot; Shank</td>
<td>C1163</td>
<td>$12</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIZE</th>
<th>PART NO.</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot; Shank</td>
<td>C1171</td>
<td>$16</td>
</tr>
<tr>
<td>3/4&quot; Shank</td>
<td>C1172</td>
<td>$20</td>
</tr>
</tbody>
</table>

DOVETAIL

COVE

<table>
<thead>
<tr>
<th>SIZE</th>
<th>PART NO.</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot; Shank</td>
<td>C1187</td>
<td>$16</td>
</tr>
<tr>
<td>1/4&quot; Shank</td>
<td>C1188</td>
<td>$20</td>
</tr>
<tr>
<td>1/4&quot; Shank</td>
<td>C1189</td>
<td>$20</td>
</tr>
<tr>
<td>1/4&quot; Shank</td>
<td>C1190</td>
<td>$34</td>
</tr>
<tr>
<td>1/4&quot; Shank</td>
<td>C1191</td>
<td>$34</td>
</tr>
<tr>
<td>1/4&quot; Shank</td>
<td>C1192</td>
<td>$40</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIZE</th>
<th>PART NO.</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot; Shank</td>
<td>C1353</td>
<td>$16</td>
</tr>
<tr>
<td>1/4&quot; Shank</td>
<td>C1354</td>
<td>$18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIZE</th>
<th>PART NO.</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot; Shank</td>
<td>C1707</td>
<td>$18</td>
</tr>
<tr>
<td>1/4&quot; Shank</td>
<td>C1708</td>
<td>$18</td>
</tr>
<tr>
<td>1/4&quot; Shank</td>
<td>C1709</td>
<td>$18</td>
</tr>
<tr>
<td>1/4&quot; Shank</td>
<td>C1710</td>
<td>$18</td>
</tr>
<tr>
<td>1/4&quot; Shank</td>
<td>C1711</td>
<td>$18</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>SIZE</th>
<th>PART NO.</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/4&quot; Shank</td>
<td>C1117</td>
<td>$16</td>
</tr>
<tr>
<td>1/4&quot; Shank</td>
<td>C1118</td>
<td>$20</td>
</tr>
<tr>
<td>1/4&quot; Shank</td>
<td>C1119</td>
<td>$20</td>
</tr>
<tr>
<td>1/4&quot; Shank</td>
<td>C1120</td>
<td>$34</td>
</tr>
<tr>
<td>1/4&quot; Shank</td>
<td>C1121</td>
<td>$34</td>
</tr>
</tbody>
</table>

ORDER TOLL FREE
1-800-235-0272

---

TALKING BACK

We welcome comments, criticisms, suggestions, and even an occasional compliment. Send your correspondence to: Letters Editor, Better Homes and Gardens® WOOD® Magazine, P.O. Box 11454, Des Moines, IA 50336-1454.

We've canceled the deadline on free patterns

Forget what you've read about expiration dates for free full-sized patterns offered with some of our WOOD magazine projects. We've decided to go ahead and fulfill your requests indefinitely when you send us self-addressed, stamped, business-sized (no. 10) envelopes. Attention foreign readers: please include an international reply coupon in your envelope.

White vinegar loosens joints, too

Here's another way to loosen glue joints as addressed in the October 1989 "Ask WOOD" question. I have found that applying white vinegar around the joints and working them back and forth will loosen glue joints. Vinegar also softens many glues, which makes cleanup easier.


Texan offers more ideas on staining cherry

In your October 1989 issue, a reader asked how to get the deep burgundy color in cherry. Your response that it takes patience was not complete. True, cherry eventually darkens with age; however, to achieve the furniture-store color, you need to do more. Stains will work, but here's another solution.

Wood, like all things natural, will react with chemicals. Knowledge of some of the chemicals present in cherry or mahogany can aid in coloring wood. Many red-colored woods contain tannic acid, which reacts with sodium hydroxide (commonly known as lye), and darkens to a deep red/burgundy color. A solution of 1 to 2 ounces per gallon of water should give you the desired color.

I've used sodium hydroxide on both cherry and mahogany with excellent results. I suggest you start with a scrap of wood sanded to the same smoothness as your finished product. First, brush on a diluted lye solution. After a short period, wipe off the excess liquid and then neutralize the lye effect with fresh water. If the color is too light, strengthen your solution. Dilute your solution if the color is too dark.

Please note that lye is poisonous and should be properly stored away from children.

—Michael Barth, Lewisville, Texas

Continued on page 10
Build along with Norm Abram!

Learn Norm Abram's Woodworking Secrets

Get the hardcover edition of THE NEW YANKEE WORKSHOP at a special discount price, and create traditional American furnishings for your home with the expert help of Norm Abram!

You'll get detailed plans for a traditional drop-leaf table . . .
workbench . . .
blanket chest . . .
bedside table . . .
bathroom vanity . . .
trestle table . . .
bookshelf . . .
chest of drawers . . .
hutch . . .
writing desk . . .
and more.

Learn how to create beautiful, traditional pieces easily, using modern tools, materials and techniques!

Follow along with the companion volume to the 12-part PBS-TV series.

THE NEW YANKEE WORKSHOP is being featured on PBS-TV across the country.

With this book you can follow along as Norm Abram builds each handsome project. You'll have a hardcover reference to use over and over—a guide to Norm Abram's remarkable skills and techniques.

Learn Norm Abram's tips for using a lathe, router, table saw, drill press, band saw and other equipment; benefit from his advice on joint-making, finishing, measuring and more!

Improve your fine-woodworking skills with the guidance of master woodworker Norm Abram. Send for your copy of THE NEW YANKEE WORKSHOP today!

FREE PLANS to build this CORNER CUPBOARD

TRY IT FREE FOR 21 DAYS!

YES! Please send me my free Corner Cupboard Plans and a copy of Norm Abram's THE NEW YANKEE WORKSHOP to examine free for 21 days. If I decide to keep the book, I'll pay for it in three easy monthly installments of $8.32 each plus postage and handling. (There is no interest or finance charge.) If I do not want the book, I'll return it with the invoice within 21 days and owe nothing. The plans are mine to keep regardless.

☐ SAVE CASH by sending $24.95 now and we'll pay postage and handling. Same return privileges as above.

42989

Name ____________________________
Address ____________________________ Apt. # ______________
City ____________________________ State ______________
Zip ____________________________

Clip and mail to: RODALE BOOKS, Emmaus, PA 18049

(NY, PA, CA, and IL residents please add state sales tax.)
NEW

AMERICAN MADE, HEAVY DUTY!

DRUM SANDER

Sand boards, frames, doors, veneer, knots, wild grain perfectly flat and smooth every time!
Reduce sanding time from hours to minutes!
Delivers sanding precision equal to large wide belt sanders at an affordable price!
This is the best drum sander in the world. It has quality features not found on other brands. Let us prove it to you. Contact your local dealer or the factory today!

☐ PLEASE SEND ME FREE BROCHURE
Telephone orders (417) 223-4031
Ross Industries Dept. FB-12
100 North Highway W, Box 837, Pineville, MO 64858

Name__________________________ Phone__________________________
Address ______________________ State ______________ Zip __________

SAVE 35% OFF LIST

BYROM PROFESSIONAL GRADE
"WHEN QUALITY COUNTS"

25° PANEL RAISER
1/4 SHANK
2" DIA
$45.00
2-1/2 DIA 1/2 SHK $55.00
3-1/2 DIA 1/2 SHK $62.00

OGEE PANEL RAISER
1/4 SHANK
2" DIA
$45.00
2-1/2 DIA 1/2 SHK $56.00
3-1/2 DIA 1/2 SHK $62.00

COVE PANEL RAISER
1/4 SHANK
2" DIA
$43.00
2-1/2 DIA 1/2 SHK $46.00
3-1/2 DIA 1/2 SHK $62.00

EURO DOOR EDGE
1/2 SHANK
$35.00

VERTICAL PANEL RAISER
"PROVINCIAL"
1/2 SHANK
$56.00

REVERSIBLE RAIL AND STILE
1/4 - 1/2 SHANK
CLASSICAL - $52.00
STRAIGHT - $52.00
OGEE - $67.00

DOOR LIP
1/2 SHANK
$58.00

5% AARP
DISCOUNT

WAFFLE TM

LU87 M010 10" X 24TH $42.00
LU88 M010 10" X 60TH $48.00
LU98 M010 10" X 80TH $79.00

WOODPECKERS 8318 MANORFORD DRIVE  PARMA, OHIO 44129
1-800-752-0725 DISCOVER - CHECKS
ORDERS OVER $25 FREIGHT PREPAID

TALKING BACK

Continued from page 8

Here's an alternative to Plantation stains

In the October 1989 "Products That Perform" column, you reported on Plantation Woodstains. I wrote the address mentioned for the name of a local retailer, but my letter was returned. Can you help me find a dealer near my home?

—Mary Albertson, Harpers Ferry, W.Va.

Mary, after contacting the Albertville, Alabama Chamber of Commerce, we learned that Plantation Woodstains abruptly stopped production and pulled up stakes after publication of the October issue. We can offer two alternatives. Deft now has several attractive pastels in their "Southwest Collection" of wood stains. Or, for a rainbow of colors, try dissolving Pentel Oil Pastels in paint thinner. A box of 25 colors sells for about $3 at most art stores.

Reader applauds 4-H involvement

As a 4-H family involved in wood-science projects, we'd like to thank you for sponsoring the Wood Science Awards program in 1990.

For the past six years, our family has taught woodworking skills, from the basics of using a tape measure to operating power tools. We teach an average of 30 4-H'ers per year, and have to turn down prospective students because we can't teach more than three days a week.

We have both boy and girl students. They've made simple cutting boards as well as difficult projects such as gun cabinets and desks. The look of satisfaction on their faces upon completing their projects is worth all the time and effort spent teaching them.

Thank you for asking your readers to volunteer as teachers. Many kids out there want to learn woodworking. I hope that many woodworkers will take the time to share their talents with a child. If you can positively touch one child and help him or her to learn and to grow, then the world will be a little better for the time spent.

The kids have built many of the designs from WOOD magazine for their 4-H projects. Thanks again for all the good you are doing.

—Gary and Marilyn Malcolm, Branch County 4-H, Coldwater, Mich.

Thanks, Gary and Marilyn. We've received similar letters from county volunteer leaders across the country. We encourage readers to get out there and pass on their woodworking talent and enthusiasm to the next generation. And, don't forget to stroll by the 4-H woodworking displays at county and state fairs. You'll find lots of high-quality woodworking—and probably some project ideas, too. And since we announced our participation, Deft and the Society of Wood Science and Technology have become sponsors.

Continued on page 12
BIESEMeyer
It still costs less to own the best.

28" Homeshop Fence ........................................ $209
40" Homeshop Fence ......................................... 229
52" Homeshop Fence ......................................... 249
50" Commercial Fence ...................................... 319
T Stop w/Stop On Tape ..................................... 64
Sliding Table .................................................... 299
Blade Guard ..................................................... 365

PORTER-CABLE
#555 Biscuit Joiner w/Case .................................. $189
#ADJF Adjustable Fence for 555 ......................... $69.95
#6931 Newt Plunge Base $99.............................. 99
#7334 Newt DA Sander ..................................... 160
#330 Speed Bloc Sander .................................. 59

Other Porter Cable Tools On Sale. Phone for Price!

Makita

New! Crank Handles for Fine Adjustment on Plunge Routers
#CH1 For Hitachi TR12 $29.95
#CH2 For Makita 3612 29.95
#CH3 For Bosch 1611 29.95
#CH4 For ELU 3338 29.95

HITACHI

#TR12 3HP Plunge Router with $60 Worth of Accessories .... $199
#M12V 3/4HP V.S. Plunge 289
#C62FB 6½" Compound Saw w/Ceramic Blade ............ 499

Eul

WOODWORKING TOOLS BY BLACK & DECKER

#306 1 HP Plunge Router .................................. $149
#3061 1 HP Electric Plunge Router ....................... 179
#3287 2½ HP Plunge Router ................................ 239
#3288 Type 2 New Improved Model 2½ HP Plunge Router 329

Taunton Press Videos VHS — 60 minutes
Installing Trim ................................................ $28.95
Installing Doors and Windows ......................... 28.95
Making Kitchen Cabinets ................................ 28.95
Tiling Floors .................................................. 28.95
Tiling Countertops .......................................... 28.95
Tiling Walls ................................................... 28.95

Bosch

Powermatic

#53 10" Contractors Table Saw w/Vega Fence .... $59
#55 10" Table Saw w/Biesemeyer 50" Commercial Fence
2HP ......................................................... 1595
3HP ......................................................... 1795
5HP ......................................................... 1985

Bosch Portable Band Saw Blades

LU83mo10"x80T Super Fine Cut ....................... $79.95
LU84mo10"x50T Combination ......................... 43.95
LU73mo10"x60T Cut-Off .............................. 39.95

High Quality U.S. Made Bandsaw Blades
Made to Length FAST DELIVERY!
7c per inch + $2.85 weld charge
3/16 to 3/4" wide
Many variations of teeth

Capswell Portable Band Saw Blades

Inca-Jig .................................................. $29.95
94-Page Book with 17 Templates for Incra-Jig .... 18.95

Taunton Press Books
The Workbench Book $24.95
Understanding Wood 24.95
The Timber Frame Home 24.95

Freud

#SD008 New 8" Safety Dado with Case .............. 139

Installation Trim .......................................... $28.95
Windows .................................................... 28.95
Making Kitchen Cabinets ................................ 28.95
Tiling Floors ................................................ 28.95
Tiling Countertops ........................................ 28.95
Tiling Walls ................................................ 28.95

Taunton Press Books
The Workbench Book $24.95
Understanding Wood 24.95
The Timber Frame Home 24.95
Oh, my ohms

In reference to the December 1989 "Talking Back" item on router speed reducers, your final conclusion that AC motors overheat when the input voltage is reduced more than 10 percent is correct. However, you incorrectly reference Ohm's law: "According to Ohm's law, if resistance in a tool remains constant (which it does, of course), then there must be an increase in amperage when voltage drops." This is incorrect. Ohm's law shows that the voltage, current, resistance, and power relationship as follows:

\[ V = I \times R \]

That the current (I) must reduce in direct proportion to the reduced voltage (V). The circuit power

\[ P = V \times I \] or \[ I \times R \]

This is what makes the motor overheat. As the voltage drops, the current drops. This causes a loss of motor speed and motor torque. Lower operating speeds, therefore, severely diminish the motor's self-cooling ability.

The loss of motor torque under load also makes the motor approach a "stall" condition, which also contributes to overheating.

Your answer was not correct for the wrong reason.


Too bad we didn't run our response by you before putting the issue on press, John. Your letter was the first of about a dozen or so that found fault with our source's application of Ohm's law. Another reader, Paul Bokros of San Diego, points out that "the problems encountered by electronic motors subjected to a lower-than-required voltage involves EMF (electromagnetic force) and cannot be explained by Ohm's law alone. The explanation is best left for an electrical engineering/technician book. Let's save the valuable space in WOOD magazine for woodworking advice, which you give so well."

Continued on page 14
One Hundred Years of Woodworking Pleasure
You build carefully. Lovingly. Precisely. Because you want things to last a long, long time. These are the tools you need.

It's a simple pleasure, working in the shop. The fresh smell of wood, the hum of your power tools. Raw lumber becomes an heirloom chest or a delightful toy. Light catches in the grain and shines on the smooth finished surfaces.

And what's better than a well-built tool, the way it responds in your hand as you shape the wood to fit your ideas? Portalign understands.

We build the tools that help you achieve fine precision. Then we guarantee them one hundred years. So you'll not only pass down your beautiful wood products to future generations. You'll pass down your tools, as well.

Portalign tools are portable, as the name suggests: They're handy away from the workshop as well as at your bench.

Drill Guide places holes precisely
You've been punching holes with a drill for years. It's no big deal most of the time. But when it's got to be just so?

Portalign's Professional Drill Guide makes tough jobs easy. Automatic centering and depth control give you the accuracy you need for center drilling, drilling at angles, perpendicular/vertical alignment. It even duplicates angle and depth exactly for multiple holes.

The handle provides additional leverage for heavy-duty work and drilling freehand. This is drill press accuracy in a portable unit. Indeed, once you've used our drill guide, you may never use a drill press again.

The Portalign Drill Guide is $24.95.

Saw Guide makes any cut a snap
Any woodworker worth his sawdust can cut a straight line. Other cuts aren't so easy. Used to be you'd need a radial arm saw. The Portalign Saw Guide changes that in a flash.

Now you'll make precision cuts every time. Perfect 90-degree cuts, angles (45 degrees, left or right), bevels, compound miters, dados. Repeat cuts exactly to match pieces. Save time and money with this completely portable saw guide.

It mounts/unmounts easily; sturdy steel construction and spring-loaded ball-bearing action deliver solid, reliable performance. Cutting reach is 16 inches at 90 degrees; the ball-bearing action reduces binding and kickback.

The Portalign Saw Guide extends the life of your saw and blade! It's just $29.95.

Order the set and save
Add these fine tools to your workshop and save 15 percent. They would cost a total of $104.85 if ordered separately. Order them together for just $88.27. (All prices plus tax and shipping.) Call now!

(800) 662-6623

PocketHole System replaces dowelling
Here's the modern way to join fitted edges. No more gluing, clamping, sanding. No more waiting for it to dry—and hoping it's straight.

The Portalign PocketHole System is fast and easy to use. It makes precision pocket holes every time. Pocket-holing makes your finished piece stronger, too.

Join any angled cuts—butt joint, post and rail, mitered—with professional-looking results. Then watch the game on TV. Or start another project!

The PocketHole System is $49.95.

Tools you'll pass to the next generation
Portalign tools have a hundred-year guarantee. If they fall under normal use, we'll repair or replace them free.

Portalign
Made with pride in the USA.
Here’s how Delta views “reverse engineering”

While the tablesaw article in your December 1989 issue was informative and did a good job of tabulating the tablesaw specifications, further insight into woodworking tools, especially those made in Taiwan, may be helpful.

It is a relatively easy and common practice by many importers to buy a successful U.S.-made product, and then “reverse engineer” it in Taiwan. However, in this situation, the copier does not have access to the product’s engineering drawings and data associated with the product. This prevents the copier from knowing how flat the table must be, how precise the arbor is, how the various parts are meant to interact with one another, and what the best machining methods are for key parts. This is not to say that a Taiwanese saw is always a poorer product, but that a copy of another’s original design will most often have little chance of being as good.

We feel that it also is important to point out that while the section of your article on “Contractor’s Style” saws correctly states that the other saws in this category are basically copies of Delta’s 34-440, it fails to mention in the “Cabinetmaker’s Style” section that the Jet, Grizzly, and Lobo are all Taiwan copies of Delta’s Unisaw.

Delta has engineered and manufactured tablesaws for over 50 years. This includes heavy-production saws in Brazil, Unisaws and contractor’s saws in Tupelo, Mississippi, and homeshop saws in Taiwan. Our Brazil and Taiwan inspectors and engineers use the same rigid quality-control standards that apply to our U.S. facility.

—Louis C. Brickner, vice president of engineering and product development

Easel folds better with a skinny leg

While building a bunch of the tabletop casings featured in the December 1989 issue, we discovered that a Bill of Materials dimension for the rear leg (B) doesn’t match the full-sized drawing on page 88. The rear leg should be 5/8” thick, as correctly shown in the drawing. For an easier fitting of the rear leg, cut the hinge (D) to the shape shown above. ✪

**FORSTNER BIT AMAZING OFFER!**

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

**7-pc Set**

1/4” to 1” in wood case

**ONLY** $34.99

Item No. #10-1325

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

**COMPLETE 16-pc Set**

1/4” to 2 1/8” in wood case

**ONLY** $89.99

Item No. #10-1330

- Wood Storage Box Included
- 3/8” shanks

For a FREE price list of individual Forstner Bits, and other woodworking tools, send your name and address to: Dollar Trading Corp.
PO Box 954
Ridgefield, CT 06877

**3” FORSTNER BIT**

1/2” shank

**ONLY** $34.99

Item No. #10-1322

**CALL TOLL FREE: 800-447-7770 • VISA/AMEX/MC**

From Canada: 616-957-5900

or write: DOLLAR TRADING CORP. DEPT WM 30
PO Box 8433 Grand Rapids MI 49512

Michigan and Connecticut buyers please add sales tax.
Super 15" Scroll Saw
On Sale... $119.95
(Includes $2 FREE Accessories)

Cut intricate wood patterns with this versatile machine.

FEATURES:
• Parallel rocker arm cutting system eliminates blade breakage & sanding
• E-Z set blade change system
• Permanently, easy to use upper arm blade holders.
• FREE Accessories - 1 dz blades, extra blade holders, E-Z set system, Plastic lettering guide set. $52 Value

SPECIFICATIONS:
• Cast iron construction
• 15" throat
• Motor: 1/2 HP, 1725 RPM, 110V, UL listed, 3/4" stroke, 2" depth of cut.
• Table tilts to 45° & 45 Lbs.

Item #SAW...$119.95 (UPS $10)

Super 125 Planer
On Sale... $349.95

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

FEATURES:
• Portable at 55 lbs
• Power feed
• 12 1/2" wide High Speed Steel Knives, shipped assembled and ready to run.

SPECIFICATIONS:
• Motor: 16Amp, 115V, 8000RPM, 2HP, 26.2 rpm auto feed rate, 16,000
• Cuts/min: Thickness of stock: 3/16" - 6" Width: 1/16" - 1"
• Item #PLA...$349.95 (UPS $15)

Wood Lathe XL-40
Reg $299.95... On Sale $249.95 (UPS $20)
(Includes FREE 8 piece Wood Chisel Set... $4 Value

- 40" Centers - 16" Swing
- Sturdy 52" steel base mounts on table or optional stand.

Our new XL-40 Wood Lathe surpasses every lathe in its price range with quality & features you would expect from machines many times its price.

FEATURES:
• Heavy Duty cast iron construction provides smooth turning action. 40" Centers - 16" Swing for turning larger bowls. Smooth toolrest movement on 1" solid steel rails. "Live" center on tailstock. Motor mounted for easy positioning and belt changes.

SPECIFICATIONS:
• Motor: 1720 RPM, 1/2HP, 8AMP, 110V
• 3 SPEEDS: 660, 1500, 2850 RPM
• Overall length: 60" Weight: 100lbs

Item #L40...$249.95 (UPS $20)

Lathe Accessories
XL-40 Lathe Stand
Heavy duty, Wt. 25lbs
Size: 26"H X 56"L X 21"W
Item #LST...$59/ea (UPS $6)

4 Jaw Wood Chuck
This 6" chuck has 4 independent jaws for holding odd or square shaped work. Can be reversed for inside chucking.
Item #LJ4...$49 (+)

8 Piece Wood Chisel Set
(Free w/purchase of XL-40 Lathe)
Forged from high carbon steel, includes 2 gouges, 2 skews, 1 round nose, 1 parting tool and 1 spear point.
Item #LCS...$34/ea (+)

Planer Accessories

Extra Set of 2 Knives
High Speed steel, 12 1/2" long
Item #PKN...$25.00/ea (+)

Dust Chute
For vacuum takeoff of wood chips.
Item #PSD...$24.00 (UPS $3)

Planer Stand
(Hardy Duty)
Steady for Super 125 Planer, 27" x 14/1"4 High.
Item #PST...$44.00 (UPS $6)

Roller Stand
HTC brand support stand w/heavy duty ball bearing roller. Height adjusts from 25" - 44”.
Item #PRS...$40.00 (UPS $6)

Ball Bearing Rollers
(Minimum purchase 2 rollers). Build a roller stand, infeed/outfeed table etc. with these 3/8" X 2" Heavy Duty rollers. Purchase includes FREE plans for roller stand shown above.
Item #BBR...$6.50/ea ($3 UPS/ord)

Two Way 4"x6" Sander
On Sale... $109.95 (UPS $8)
(Includes $10 FREE Belts & Discs)

Here's a machine that adds true versatility to your shop.

FEATURES & SPECIFICATIONS
Uses universally available 5 discs. 4" x 36" belts. Includes Assortment OF 5 Belts.

DC-1 Dust Collector
(Includes $15 FREE Hose & Fittings)
On Sale... $169.95 (UPS $29)

Here's a machine that adds true versatility to your shop.

FEATURES & SPECIFICATIONS
Uses universally available 5 discs. 4" x 36" belts. Includes Assortment OF 5 Belts.

PENN STATE INDUSTRIES - 2850 Comly Road • Philadelphia, PA 19134
Order Toll Free 1-800-288-7297 (Ext 90) Information 1-215-676-7690 (ext 15)
Visa, Master, & Discover Card accepted. Pennsylvania residents add 6% Sales Tax. When ordering, add UPS Shipping Charges as noted (+) No charge for accessories ordered with a machine, add $3 to ordered separately. UPS charges are for Continental U.S. only.
Improved bench hold-down
Louis Hathaway of Yankeetown, Fla., wrote to us after he had problems putting together the bench hold-down that appeared in the December 1989 issue. Because of tapered threads, he had a problem finding a floor (pipe) flange that made the hold-down easy to use. So, he made a ½" plywood donut as shown at right to solve the problem. Thanks, Louis!

Shims that don’t fall off your pipe clamps
When banding plywood or edge-joining stock, it helps to use thin scraps of wood as shims or spacers to raise the workpiece above the clamp’s pipe. Unfortunately, these scraps fall out and are a pain to manage while you’re setting up your clamps.

TIP: For ¾" pipe clamps, cut 1" lengths of 1" PVC pipe. Make one longitudinal cut in each one so it slides easily along the pipe and slips on as shown in the drawing below. For ½" pipe clamps, cut the shims from ¾" PVC pipe. These split rings elevate the work about ⅛" from the pipe, putting it closer to the center of the jaws.

—Terry L. Davis, Ft. Pierce, Fla.

A simple jig for grooving dowels
Carefully fitted dowels will trap both air and excess glue when inserted. Unless you provide an escape route, that air or adhesive may prevent you from bringing together the joined pieces. If you force them together, the built-up hydraulic pressure may cause the dowel to pop out of its hole when you’re not looking.

TIP: For dowels 1½ to 2" long, build a jig out of scrap wood as thick as the dowel length. Near one end, drill a hole the same diameter as the dowel and then crosscut the scrap so two-thirds of the hole remains as shown below. Insert the dowel in the jig and cut a ¼" saw kerf ¼" deep with a bandsaw. One groove will allow air and glue to escape. Now, you can plug away with confidence!

—George Mitro, Jr., El Paso, Texas

Here’s an idea that’s easy to warm up to
Removing old sandpaper attached to disc sander with pressure sensitive glue can become a headache, especially when the adhesive won’t release. Eventually, the paper tears and pulls apart and leaves a mess on the metal mounting plate. There has to be an easier way!

TIP: Use heat to soften the adhesive. The source can be a handheld hair dryer as shown, a heat gun or even a heat lamp. Apply heat directly to the sanding disk in a waving motion that covers the entire disk. Test by lifting the disc, and use more heat if necessary.

—Steve E. Miller, Dallas, Ore.

Continued on page 18
Like Having a Lumberyard Right In Your Shop!

NOW! PLANE, MOLD, SAND and SAW with

Infinitely Variable Power-Feed!

MAKES YOU MONEY... SAVES YOU MONEY!

Put this versatile power-feed tool to work in your shop... see how fast it pays for itself! Quickly converts low-cost rough lumber into valuable finished stock. Turns out perfect picture frame moldings, quarter-round, casing, tongue & groove... all popular patterns... any custom design!

✓ Just a twist of the dial puts twice as many cuts-per-inch at your fingertips as any comparable planer — from 70 to over 1,000 CPI! This heavy-duty machine will sail through even the toughest oak at higher speeds, or you can slow it down to handle those "hard-to-work" pieces like curly maple, knotty cedar, burls, knees and much more! A valuable feature for molding work, where profiles make sanding impossible.

✓ Change to Molding or Sanding in just minutes! Unique "Morse-Taper" Quick Change Cutterhead guarantees fast changeover... bearings remain factory set... precisely aligned at all times.

✓ Now choose from three powerful models! Woodmaster introduces the first 18" and 25" Planer/Molders... with all the features that have made the 12" model the most versatile Planer/Molder on the market! Send for Free Facts today!

MAIL COUPON TODAY OR CALL TOLL FREE 1-800-538-4200 Ext PW36

Here's What Woodmaster Owners Say:

Shop Test Results — "It does an excellent job of planing... on a par with more expensive machines, and even better than some commercial models."

Editor, Workbench Magazine

Best Value — "After checking them all, Woodmaster was obviously the best deal for the money. Also, I would like to acknowledge the polite and prompt service."

E. D. Holt, North Carolina

FREE 30-DAY TRIAL!

Woodmaster's Quick-Change Molding Head lets you create custom moldings from any stock. Choose from over 250 standard trim and picture frame patterns... or design your own!

Power-fed sanding speeds production and improves the quality of your work. No more waves or cross-grain scratches. Separate sanding head installs in just minutes.

New rip saw attachment lets you gang-rip with power feed in a fraction of the time it takes for multiple hand-fed passes on an ordinary table saw.

Woodmaster Tools, Dept. PW36, 2908 Oak, Kansas City, MO 64108

NAME
ADDRESS
CITY
STATE ZIP

□ YES! Please rush me your FREE Information Kit which tells in words and pictures why this amazingly designed power-fed shop is so much better than other single-purpose or combination tools. Also send me details on your 30-DAY FREE TRIAL GUARANTEE.
WE'LL PAY YOU A HUNDRED BUCKS TO JOIN UP WITH US.

Put the new Delta Plate Joiner in your shop and Delta will put a check for $100 in the mail to you. This stationary Plate Joiner goes way beyond a portable joiner. It handles edge, face, bevel edge, bevel end, miter joining and tee-molding. It cuts all three biscuit sizes. A foot pedal controls blade movement so both hands are free to control your work and speed up the operation.

An adjustable table handles large workpieces and accommodates an adjustable stock stop. If you're ready to join up with the best, call toll-free for the name of your participating Delta Distributor.

TIP: A strap clamp that uses a pressure pedal to hold workpieces on a bench often solves these oft-encountered wall quandaries. Materials needed include 4' of 1"-wide canvas strip, a panhead screw, a washer, and assembling the pieces as shown. This arrangement will hold carvings of most any shape and size.

A curtain call for finishing small parts

Finding a suitable place to keep small parts while they dry after staining or finishing can leave you in a real quandary.

**TIP:** Screw a length of curtain rod to a ceiling joist for a great out-of-the-way place to hang up such parts. Slip drapery carriers into the track, add curtain hooks, and you have a drying rack that's ready to use. Screw small cup hooks into the backs of the workpieces and hang them on the rack with lengths of wire or thread and apply finish. These will hold a surprising amount of weight. If you don't want to make screw holes in the backs of the pieces, use straight pins with hooks bent into them near the heads. Or, attach hooks to the pieces with hotmelt adhesive.

—Robert McGlone, Elyria, Ohio
 Continued on page 21

---

**IF YOU THINK OUR NEW BAR CLAMP LOOKS GREAT, WAIT UNTIL YOU GET YOUR HANDS ON IT.**

Pick up the new QUICK-GRIP™ Bar Clamp. Squeeze the pistol grip handle to tighten clamping pressure. One finger on the quick-release trigger unlocks the clamp.

You've only used one hand.

The revolutionary pistol-grip mechanism puts control of clamping pressure in the palm of your hand. You can work faster, with more precision. Positive locking action holds work tight. Quick-release trigger lets go in a snap. High-tech resin construction is strong yet lightweight. Instantly adjustable clamping pressure. Large, pliable pads won't mar work. Available in five sizes - 6"/150mm, 12"/300mm, 18"/455mm, 24"/605mm, 36"/910mm.

Get your hand on the new QUICK-GRIP Bar Clamp wherever quality tools are sold. Yes, it looks revolutionary. And this time, looks aren't deceiving.

QUICK-GRIP™

A UNIT OF AMERICAN TOOL.COMPANIES, INC.

U.S. AND FOREIGN PATENTS PENDING.
**THE SANDER WITH STRONG APPEAL**

The efficient design of the Super-Max combines the proven features of the Performax S/T Drum Sander and the Power Feed with a 5 HP motor and a heavy duty stand for the most affordable drum sander of its size.

The patented, self-cooling, sanding drum has built-in sandpaper fasteners for quick and easy sandpaper attachment without adhesives or tape.

The innovative Power Feed uses an abrasive conveyor belt for a hard, non-slip surface for precise sanding and a consistent feed rate. These exclusive features will uniformly sand veneers and boards as short as 2-1/4".

Perfomax Products offers a complete line of affordable and efficient drum sanders for use in cabinet shops, home workshops, custom furniture shops and in musical instrument making.

For a Free Brochure or the Dealer Nearest You Call or Write to:

PERFORMAX PRODUCTS, INC.
12211 Woodlake Dr., SW, Burnsville, MN 55337

<table>
<thead>
<tr>
<th>BELTS: GRITS ASSORTED</th>
<th>SHEETS: (9 x 11) PRICE</th>
<th>CABINET PAPER</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 x 30 $0.69 ea</td>
<td>1 x 24 $0.80 ea</td>
<td>50/pk 100/pk</td>
</tr>
<tr>
<td>1 x 42 $0.69 ea</td>
<td>1 x 27 $0.83 ea</td>
<td>40-D $16/pk</td>
</tr>
<tr>
<td>1 x 44 $0.69 ea</td>
<td>1 x 21 $0.83 ea</td>
<td>30-D $20/pk</td>
</tr>
<tr>
<td>1 x 6 $0.69 ea</td>
<td>1 x 15 $0.91 ea</td>
<td>20-D $25/pk</td>
</tr>
<tr>
<td>2 x 3 $0.69 ea</td>
<td>1 x 10 $0.94 ea</td>
<td>10-D $30/pk</td>
</tr>
<tr>
<td>3 x 9 $0.69 ea</td>
<td>1 x 6 $0.94 ea</td>
<td>6-D $35/pk</td>
</tr>
<tr>
<td>4 x 6 $0.69 ea</td>
<td>1 x 4 $0.94 ea</td>
<td>6-D $25/pk</td>
</tr>
<tr>
<td>5 x 4 $0.69 ea</td>
<td>1 x 3 $0.94 ea</td>
<td>6-D $20/pk</td>
</tr>
<tr>
<td>6 x 3 $0.69 ea</td>
<td>1 x 2 $0.94 ea</td>
<td>6-D $15/pk</td>
</tr>
<tr>
<td>7 x 2 $0.69 ea</td>
<td>1 x 1 $0.94 ea</td>
<td>6-D $10/pk</td>
</tr>
<tr>
<td>8 x 1 $0.69 ea</td>
<td>1 x 0.75 $0.94 ea</td>
<td>6-D $5/pk</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>OTHER SIZES ON REQUEST</th>
<th>FINISHING PAPER</th>
</tr>
</thead>
<tbody>
<tr>
<td>NO LOAD PAPER</td>
<td>80-A $10/pk 100/pk</td>
</tr>
<tr>
<td>50/pk 100/pk</td>
<td>100 thru 200A $16/pk 14/pk</td>
</tr>
<tr>
<td>100-A thru 500A $10/pk 18/pk</td>
<td></td>
</tr>
<tr>
<td>PRESSURE SENSITIVE</td>
<td>220 thru 700A $13/pk 33/pk</td>
</tr>
<tr>
<td>ADHESIVE DISCS!</td>
<td>500 thru 7500 $16/pk 35/pk</td>
</tr>
<tr>
<td>JUMBO CLEANING STICK $8.00</td>
<td></td>
</tr>
</tbody>
</table>

**SUPER-MAX**

Heavy Duty Drum Sander

5 HP Motor
24" Sanding Width
Variable Feed Rate (0-20 feet/minute)

IN TEXAS 214-377-9585
OUTSIDE TEXAS 1-800-367-4101

TEXAS RES. ADD 7% SALES TAX
CONTINENTAL U.S. SHIPPING CHARGES ADD $4.25
TIPS FROM YOUR SHOP (AND OURS)

Continued from page 19

Catch that storm of lathe chips

Turning wood on a lathe often generates a cloud of dust and fine chips that can nearly overcome you after a few minutes.

TIP: In a suitable length of 1" x 4" stock, cut a hole just large enough to receive the nozzle of your dust collector or shop vacuum hose. Place it underneath the piece being turned. If the size of your workpiece allows, make a box with the hose fitted near the bottom.

—Mark T. Jones, Durham, N.C.

Blocks suited to a "T"

It's tricky jigsaw work to cut along curvy lines on a large panel. The problem: How to properly support the workpiece and provide blade clearance.

TIP: Make T-blocks from 2" x 4" pieces as illustrated. Four or more of these provide plenty of clearance for any jigsaw blade and support the panel.

—Ralph R. Parschen, Pine Bluff, Ark.

VISIT THE SHOW NEAR YOU!
- Free Workshops - Door Prize
- Hundreds of Products
- Seminars by Mastercraftsmen

The Woodworking Shows
machinery tools supplies

See the Wildest Variety of
Woodworking Products
All Under One Roof!!
HUNDREDS OF ITEMS! NEW PRODUCTS!
- Machinery • Power & Hand Tools • Supplies
COMING IN 1990
- Arizona • Kansas City
- Atlanta • Louisville
- Calgary • Milwaukee
- Charlotte • No. California
- Chicago • Oregon
- Cincinnati • Pittsburgh
- Cleveland • Richmond
- Colorado • Rochester
- Columbus • St. Louis
- Connecticut • Salt Lake City
- Dallas • San Diego
- Delware Valley • Seattle
- Detroit • So. California
- Indianapolis

1-800-826-8257 or 213-477-8521
Call NOW to be placed on mailing list for FREE Brochure & Discount Coupons
Phone Hours 8-5 Pacific Time Weekdays

EAGLE AMERICA
"Come Back to American Made Quality - Come Back To Eagle"

Router Bits
Free Catalog
Made In U.S.A.

Send for the complete 52 page mail-order catalog featuring over 900 different router bits, shaper cutters and accessories.

☐ Send me a FREE catalog via 3rd class mail. (Allow 4-6 week delivery.)

☐ RUSH me a copy TODAY via first class mail. I've enclosed a check for $3.00 for special postage and handling.

BONUS: You will receive with your catalog a $5.00 refund good towards your first purchase.

MAIL COUPON TO: Eagle America
BOX 1099 CHARDON, OH. 44224

Name ____________________________
Address ____________________________
City __________________ State ______ Zip ______

Take the work out of woodwork.

Take the work out of repairing nicks, cracks and gouges with Elmer's® Fill 'N Finish™ Wood Filler. It spreads easily, requires little or no sanding and takes on any stain.

The Home Solution® is:

For a 4 oz. sample of Elmer's Fill 'N Finish Wood Filler, send $2.00 with your name and address to Fill 'N Finish, The Fulfillment Center, R.O. Box 369033, Columbus, OH 43269-0033. Specify blond or tan. It's THE HOME SOLUTION to a beautiful finish.

NAME ____________________________
ADDRESS ____________________________
CITY __________________ STATE ______ Zip ______

MEISEL HARDWARE SPECIALTIES
WOODWORKERS HARDWARE

Country Yardssticks

1/2" x 5' $1.29/EA
1/2" x 10' $2.19/EA
1/2" x 20' $3.99/EA

Craft Plywood

3mm (1/32") x 5' x 4' $4.59/EA
2-9 Sheets $3.59/EA

Cockle Jar w/Metal Lid

#633 Plastic Jar 16 oz. $1.79/EA
#663 Metal Lid $1.59/EA

1/4" Basswood Boards

#7253 3-1/2" x 16 linear ft $13.59/EA

Basswood Glue-Ups

#6589 1/2" x 1/4" x 36" $19.95/EA
#6592 1-1/8" x 1/4" x 36" $21.95/EA

After 12-31-89 $14.25/EA

Birch Candle Cup

#C1 1-1/2" $2.99/EA
#C2 1-1/2" $3.99/EA

Lazy Susan

#L3 3" $1.99/EA
#L4 4" $2.99/EA

Clampboard Clips

#S3 3" $2.99/EA

Saw Tooth Hangers

#509 1-5/8" $4.17/EA

Black Hammer Hinge w/Screws

#7103 1/2" 1/2" $1.50/EA
#7201 1/2" 1/2" $1.35/EA
#7882 1" 1/2" $2.59/EA

Brass Plated Screw for above

#F12S 5/8" Fl. Ht $2.75/EA

Sanding Belt

Chesner 8" $13.15/EA

Plastic Spoke Wheel 4" $3.09/EA

Metal Wheels

#1779 1-1/2" $1.69/EA
#1760 2" $2.59/EA

Metal Stakes

#S2 1/2" x 12" $4.17/EA

Shaker Pegs

#7220 3-1/2" $5.99/EA

Birch Spindles

#66 5/36" $1.99/EA

Galley Spindles $2.49/EA

#51 Birch 1-1/8" $1.69/EA

Animal Eyes

#6681 1-1/8" $3.50/EA
#6862 1-1/2" $4.30/EA

Chair Back Spindle 21" $3.99/EA

Metal Pads 2-1/4" $0.99/EA
#5711 Galvanized $0.99/EA

Synthetic Sheep Wool 60" Wide $9.95/YD
9064 Sheep Wool $9.95/EA

Wood Hearts

#7379 3/4" x 3/16" $0.69/EA
#7382 1" x 3/8" $0.99/EA

Brass Bottle Opener

#7074 $3.99/EA

Grocery List Pad of 500

#14P Buff Color $7.99/EA
#7430 Peach Color $7.99/EA

1" Grid Paper

8/260 22" x 34" $1.50/EA

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

ADD SHIPPING & HANDLING:
Mail check or money order and include $4.05 shipping & handling. UN, Alaska, 6% tax, Canada send $19.50 p/h Canada send $19.50 (U.S.) p/h. We accept VISA or MC on orders over $25.00.

MINIMUM ORDER OF $25.00

ORDER TOLL FREE Charge Orders Only 1-800-441-9870

MEISEL HARDWARE SPECIALTIES
P.O. BOX 70 W-5 MOUND, MN 55364

TIPS FROM YOUR SHOP
(AND OURS)

Continued from page 21

Build self-hanging picture frames

It's great fun to cut your own picture-frame stock and set it together. Unfortunately, conventional hanging devices such as screw eyes with wires or serrated metal hangers don't allow the frame to hang flush against the wall.

TIP: As you cut your frame stock, leave an extra quarter-inch of material on the backside for a 1/8" kerf deep and 1/4" inside the edge as shown. Hang the picture on two pan-head screws spaced apart on a level line about half the width of the frame. The top of the screw heads should protrude 3/4" from the wall. The picture remains plumb and flush against the wall, but you can shift it horizontally.

—Keith Hyde, Des Moines

Clamps help you sand edges

Hand-holding a belt sander to finish the edge of one or more pieces of stock can turn into a balancing act. Here's a dependable way to do it and make the boards an even width at the same time.

TIP: Hold the pieces together with hand-screw clamps as shown at right and secure one end of the assembly to the benchtop with a third clamp. This arrangement gives you a wide, stable surface to sand and, ensures uniform sanding of the material. If you have only one board to sand, clamp auxiliary scrap boards of equal or longer size to its sides to support the sander.

—Charlotte Arthur, Colbert, Okla.

More super tips from our woodworking pros

You'll find more tips throughout this issue of WOOD magazine:
- You can cut shapes in glass using a sandblaster. See page 37.
- It only takes a few seconds to cut a flush box and lid with the tablesaw procedure on page 54.
- The zero-clearance auxiliary scroll saw tabletop on page 58 helps you make splinter-free cuts.
- Even if you don't need our forty tablesaw base on page 60, you might be interested in the push stick pattern and handy blade holder shown in that article.
- To drill even-angled multiple holes, see our advice and drilling jig on page 70.
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 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 tool belt.)

• Less Tear Out
• Feed at Comfortable Rate
• Better, Safer Results with Large Diameter Bits
• Less Wear on Bits
• Less Noise and Smoother Starts at Lower Speeds

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

CARBIDE TIPPED ROUTER BITS  PROFESSIONAL PRODUCTION QUALITY GUARANTEED

WHEN ORDERING ANY THREE OR MORE DEDUCT $1.00 EACH. ALL PRICES ARE POSTAGE PAID

<table>
<thead>
<tr>
<th>ITEM NO.</th>
<th>BEST CUT</th>
<th>BEST PRICE</th>
<th>DESCRIPTION</th>
<th>ANGLED/DEPTH/RADIUS</th>
<th>CIRCLE DIAMETER</th>
<th>LARGE DIA</th>
<th>CUTTING LENGTH</th>
<th>SHANK SIZE</th>
<th>PRICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>4400</td>
<td>1/4&quot;</td>
<td>Classical</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$25.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4401</td>
<td>1/4&quot;</td>
<td>Classical</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$25.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4722</td>
<td>1/4&quot;</td>
<td>Classical</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$25.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4211</td>
<td>1/4&quot;</td>
<td>Roman Ogee</td>
<td>1/4&quot; R</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4212</td>
<td>1/4&quot;</td>
<td>Roman Ogee</td>
<td>1/4&quot; R</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4611</td>
<td>1/4&quot;</td>
<td>Roman Ogee</td>
<td>1/4&quot; R</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4340</td>
<td>1/4&quot;</td>
<td>Cove</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4341</td>
<td>1/4&quot;</td>
<td>Cove</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4342</td>
<td>1/4&quot;</td>
<td>Cove</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4343</td>
<td>1/4&quot;</td>
<td>Cove</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4344</td>
<td>1/4&quot;</td>
<td>Cove</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4350</td>
<td>1/4&quot;</td>
<td>Round Over</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4351</td>
<td>1/4&quot;</td>
<td>Round Over</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4230</td>
<td>1/4&quot;</td>
<td>Round Over</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4354</td>
<td>1/4&quot;</td>
<td>Round Over</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4355</td>
<td>1/4&quot;</td>
<td>Round Over</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4636</td>
<td>1/4&quot;</td>
<td>Round Over</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4657</td>
<td>1/4&quot;</td>
<td>Round Over</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4370</td>
<td>1/4&quot;</td>
<td>Rabblet</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4670</td>
<td>1/4&quot;</td>
<td>Rabblet</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4386</td>
<td>1/4&quot;</td>
<td>Slot Cutter</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4388</td>
<td>1/4&quot;</td>
<td>Slot Cutter</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4403</td>
<td>1/4&quot;</td>
<td>DoveTail</td>
<td>8 degree</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4405</td>
<td>1/4&quot;</td>
<td>DoveTail</td>
<td>16 degree</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4409</td>
<td>1/4&quot;</td>
<td>DoveTail</td>
<td>16 degree</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4709</td>
<td>1/4&quot;</td>
<td>DoveTail</td>
<td>8 degree</td>
<td>Face</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4422</td>
<td>1/4&quot;</td>
<td>DoveTail</td>
<td>8 degree</td>
<td>Face</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4404</td>
<td>1/4&quot;</td>
<td>DoveTail</td>
<td>8 degree</td>
<td>Leigh</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
<tr>
<td>4708</td>
<td>1/4&quot;</td>
<td>DoveTail</td>
<td>8 degree</td>
<td>Leigh</td>
<td>1/4&quot;</td>
<td>1/4&quot;</td>
<td>$12.00</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

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

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

SAVE 55% SALES PRICE $69.95 FOR COMPLETE SET

RAISED PANEL BIT SUPPLIED WITH BALL BEARING

CARBIDE TIPPED 1/4" Shank

To order by Master Charge or Visa Call Toll Free, 7 Day - 24 Hour Order Service
1-800-533-9296 or send check to: MLCS Ltd., P.O. Box 4053DF, Rydal, PA 19046
Get your hands on the perfect set of tools for every job...

ANY 3 BOOKS FOR ONLY $3.95

plus shipping and handling with membership

Tool up now with any 3 of these great do-it-yourself titles

The sharpest, the strongest, the most dependable tool in the world is know-how. And know-how (the tool to do it right) is exactly what you get from Popular Science Book Club®.

In fact, with a little effort on your part and the tools and techniques the Club brings right to your door, there's virtually no project you couldn't handle around the house. And that includes building your own house!

Here's what you can look forward to as a Member of Popular Science Book Club:

• Know-how that's backed by 25 years experience as America's oldest and largest do-it-yourself club
• Club prices—25% off publisher's prices
• Special discounts of as much as 50% off
• Shop at home convenience

Take a look now at some of the handy titles you'll want within reach and pick any 3 for just $3.95 (plus shipping and handling with membership).

ORDER TODAY! Mail coupon to: Popular Science Book Club®, 1716 Locust Street, P.O. Box 11464, Des Moines, IA 50380-1464.
How the Book Club Works:

Popular Science Book Club gives you an array of choices, but the decision is yours. You buy only what you want and you always have at least 10 days to make a decision. We'll send you our regular mailing—the Club Bulletin—once every four weeks (13 times a year) plus one Special Member Mailing. Each Club Bulletin will describe our Main Selection, a special book chosen by our editors, and over 50 other choices. If you would like the Main Selection, do nothing; it will be sent automatically. For another book, or none at all, mark your preference and return the card by the date specified. You'll always have at least 10 days to decide.

Should the Bulletin arrive late and you receive an unwanted selection, simply return it at our expense for full credit. All you agree to buy is two additional books over the next year at regular price. (A shipping and handling charge plus applicable sales tax is added to all shipments.) And you may cancel your Membership at any time thereafter.

If card is missing, write us at: Popular Science Book Club® 1716 Locust St., P.O. Box 1464, Des Moines IA 50308-1464

Special Membership Offer

Please enroll me as a Member of Popular Science Book Club® and send me the 3 selections indicated by the numbers I have filled in below. Bill me just $3.95 plus shipping and handling (and sales tax where applicable). I understand the Membership Plan as described in this advertisement and agree to buy just 2 more offerings at Club prices during the next 12 months.

Name __________________________
Address __________________________
City __________________________ State ______ Zip ______

Special Half-Price Offer! If you wish, use this box to pick a 4th book now for just 50% off the publisher's price (plus shipping, handling and applicable sales tax). Offer valid in U.S.A. only. All orders are subject to acceptance by Popular Science Book Club®. We reserve the right to cancel your Membership at any time. This offer expires December 31, 1990.
Thin Kerf. Advanced Design.

The Freud Difference

Superior Carbidite. Some of the physical properties of carbide, elasticity, hardness and resistance to chemicals, can be changed to meet cutting requirements.

To ensure the blade you buy has the best carbide qualities for its purpose, Freud produces special blends at its own factory. Through a combination of robotic and computer monitoring, each batch is checked to assure purity and quality.

Advanced CAD System. The Computer-Aided Design System simulates actual cutting conditions in three dimensions and records the blade performance. This allows Freud engineers to electronically vary the material being cut and the blade's physical characteristics to develop saw blades that provide optimum cutting performance.

Laser Technology. A computer-controlled, 500-watt laser is used in the production of Freud cutting tools. The concentrated beam of light creates a perfectly round blade, produces shoulders identical in size and precisely centers the arbor hole. Expansion slots are strategically placed to allow for heat dissipation during brazing and blade body expansion during actual use.

Freud Perfects the Thin Kerf Blade.

Using advanced technology, Freud's international team of European and North American engineers have perfected the thin kerf saw blade. They have eliminated misaligned teeth, poor blade body tensioning, carbide chipping and a variety of other problems common with some thin kerf blades.

The kerf on the Freud 10-inch crosscut blade, 28% thinner than the standard .126 inch kerf blade, reduces material loss when working with rare or expensive wood.

Freud's thin kerf blade also requires less energy to feed the material into the saw blade, eases the strain on your power tool and makes your work easier and safer.

Turn your under-powered saw into a real board cutting champion with Freud's thin kerf blade. Each thin tooth takes out less wood than the standard carbide blade, thus requiring less horsepower to produce equally good results. Also, the radial arm saw's aggressive self-feeding characteristics are virtually eliminated.

For the best value in advanced thin kerf blade technology, demand Freud.

<table>
<thead>
<tr>
<th>Stock Number</th>
<th>Thin Kerf Rip</th>
<th>Kerf</th>
</tr>
</thead>
<tbody>
<tr>
<td>L87M008</td>
<td>8&quot; x 22 x 5/8&quot;</td>
<td>.086 inch</td>
</tr>
<tr>
<td>L87M010</td>
<td>10&quot; x 24 x 5/8&quot;</td>
<td>.094 inch</td>
</tr>
<tr>
<td>L88M008</td>
<td>6&quot; x 48 x 5/8&quot;</td>
<td>.182 inch</td>
</tr>
<tr>
<td>L88M009</td>
<td>9&quot; x 54 x 5/8&quot;</td>
<td>.190 inch</td>
</tr>
<tr>
<td>L88M010</td>
<td>10&quot; x 60 x 5/8&quot;</td>
<td>.200 inch</td>
</tr>
</tbody>
</table>

Call for the name of your local distributor:

Freud Inc.
218 Field Ave.
High Point, NC 27264
(336) 434-3171
800-334-4107
FAX (336) 434-5468
NORTHERN RED OAK

From men-of-war to kitchen cabinets, always number one

To England's ancient druids, the oak symbolized strength. Warlike Norsemen even cherished pieces of the wood as charms to protect them from evil. But to the Greeks, Romans, and later seafaring nations, oak meant sturdy men-of-war and reliable merchant ships. In fact, England and France reserved whole forests for use in building their fleets. That's why red oak from North America saw immediate popularity when it was introduced to those countries in the early 18th century. Within a few years, northern red oak substituted for native English and European oak species and was crafted into furniture and paneling.

Even after centuries of popularity, northern red oak still outsells all other hardwoods. And luckily, it's plentiful, comprising about one fifth of the standing timber species grouped as red oak.

Wood identification
The broad, spreading crown of the northern red oak (Quercus rubra) shades the landscape in a sweeping range that covers nearly half the U.S. and much of southeastern Canada, as shown on the map, top right. More commonly called red oak, but also known as eastern red oak, gray oak, and Canadian red oak, the tree can grow to 150' heights with trunks 6' in diameter in fertile upland forest soil. Open-grown trees more often approach only 70', with trunks that separate into several large branches.

Northern red oak has distinctive leaves up to 9" long, with a pointed bristle on each lobe tip. In the spring, flowing catkins of pollen-bearing flowers emerge amid the greeneries. Acorns about 1" long develop every two years.

Rare is the board of northern red oak that carries a trace of its light-colored sapwood. Instead, the vast majority of northern red oak treats woodworkers to nicely figured heartwood with a pinkish tint.

You'll find that northern red oak has coarse-textured, straight, open grain. This hard, stiff, strong wood weighs 44 pounds per cubic foot dry—just a little more than walnut.

Uses in woodworking
Ever since the early 1970s, northern red oak has been highly favored for kitchen cabinets, and still leads in appeal for all kinds of furniture as well as millwork and flooring. Turners and carvers, too, find the wood a choice stock for decorative projects. (To learn about this wood's working properties, turn the page.)

Availability
Hardwood dealers and home centers offer northern red oak as lumber, veneer, plywood, turning squares, and dowels. But, all northern red oak won't be the same. Trees from the North—from the Appalachians on into Canada—grow slower and therefore have a more uniform color and a finer, easier-working texture than those from the South. Other characteristics remain the same, though. And, no matter where the wood hails from, board-foot price hovers around $3.

Continued
Machining methods
As most woodworkers will attest, red oak works wonderfully, but it doesn't require power tools. Even then, the wood sometimes takes special handling. Our observations:
- Feed red oak on the jointer so that the knives' rotation follows the direction of the grain flow (see sketch, below). Failure to do this generally produces chipping.
- Due to red oak's open, straight grain, it offers only moderate resistance to ripping.
- Red oak quickly dulls anything other than a carbide blade.
- Too fast a feed rate on the table or radial-arm saw, or with the router, can cause burning, although burns sand off easily.
- Red oak tends to splinter. So, use shallow router passes on end grain and a backing board clamped to the exit side on cross-grain work.
- Metal, such as a clamp bar, touching glue squeeze-out produces a dark blue stain. Lay wax paper over the glue line.
- Red oak grips screws, but even with pilot holes, lubricating the threads with paraffin eases driving.
- Although red oak sands readily, try garnet paper for hand-sanding and with orbital sanders. For belt sanders, we prefer oxide-type abrasives. Swirls and other sanding marks come off nearly effortlessly.
- For the smoothest possible finish, fill red oak's grain with a paste-type filler. The filled wood (see photo, top right) has less dramatic grain contrast, but it requires fewer coats to build the final finish. For a lighter fill, sand surfaces with Danish oil as a lubricant. The sanded-off fiber packs the grain.

Carving comments
Only the most accomplished carvers tackle hard red oak, and then mostly for relief work. You won't get far without a mallet and very sharp gouges. Some tips:
- Change from a shallow bevel (of 15°-20°) to a deeper bevel of 25°-30° when you rough-in the outline of a relief design. Your gouges stay sharp longer. Then, when it's time to do the details and complete the carving, grind to a shallow bevel again for shaving.
- Our advice: Avoid slices along straight grain with stop cuts.

Turning tricks
- When turning between centers, combat splinters by entering the wood with a sharp tool, such as a clean-cutting skew, and taking shallow cuts, especially when first rounding the turning square.
- Our turning tip: Keep tools sharp to cut rather than abrade. And, don't start at one end and cut all the way to the other. Remove wood a little at a time in each section because the grain may run on a bias and splinter away.

[Box: RED OAK AT A GLANCE]

Compiled with woodworkers Jim Boelling, Don Wipperman, carver Ron Mackey, and turner Cleat Christiansen  Illustrations: Steve Schindler, Mike Henry
Long Live THE BARK CANOE!

Welcome to Max, Minnesota, home to a wild-rice processing company, grocery, hardware, mercantile, post office, and lumberyard—all in one building. Within a crow’s flight, there also are half-dozen resorts, two or three unpretentious eateries, a few hardy logging enterprises, some struggling farms, and longtime summer resident Jack Minehart, master canoe builder, above.

From late May through most of August’s heat, Jack, 54, plies his craft on Little Sand Lake, building three or four bark canoes per season. Come late summer, he reluctantly hangs his tools, locks the shop, and packs for the return to Cedar Falls, Iowa. There, a classroom of high school students awaits his textbook history instruction. We, however, prefer the hands-on lessons Jack taught us up north.

“Because it’s built of spruce root pulled from the bog, cedar felled in the lowlands, and birch bark stripped deep in the damp forest, the bark canoe thrives in contact with water.”

—John D. (Jack) Minehart
Canoe builder
THE BARK CANOE

Max, a sunlit break in the shaded heart of northern Minnesota's Chippewa National Forest and the Leech Lake Indian Reservation, seems a logical place to find a canoe builder. After all, the area's Chippewa Indians once claimed such craftsmen. Before the days of white settlement, the native canoe builders provided the craft for their people's frequent travel on the land's countless lakes and rivers.

Roads, rails, and motors, however, long ago dashed and sank the bark canoe. As horses and wagons—then trains, automobiles, and outboard motors—replaced paddles, the necessary techniques to build the craft faded in the aged hands of the skilled. Jack Minehart learned the primitive ways, not as passed from red man to white, but as unearthed by a local living legend, William Hafeman. Jack's mentor came north before the Depression to wrest an existence, and learned to build canoes from those who remembered.

From Hafeman, now in his 90s, Jack learned how to gather materials, prepare them, and assemble a bark canoe to match any of old. His keen interest in history and the outdoors had finally combined to preserve a part of the past.

Aboriginal origins, practical uses

Jack notes that the first French explorers of 17th century in what was to become Canada—and later the English in the northern United States—were impressed by the Indians' light, swift craft. They recorded that the native boats with two paddlers easily outdistanced European longboats with several oarsmen. But, according to the canoe builder, it wasn't until the great fur trade began in the early 18th century that what came to be called the canoe was really appreciated.

It required swift travel for men and trade goods to reach the vast and roadless northern interior, then return with loads of valuable fur before the coming of winter. And the lightweight bark canoe with its sturdy wooden frame was the essence of speed as well as a workhorse. A 26'-long trade canoe, for instance, could easily carry a 2,000-pound payload and a crew of six.

To the fur traders who bought and the tough voyageurs who paddled, the canoe had other advantages. "It fit the environment perfectly," Jack remarks. "It could maneuver the smallest rivers and float in shallow water. Surprisingly rugged, the bark canoe withstood all but the harshest abuse. Best of all, the traders could employ Indians to build them quickly and inexpensively, and even the unskilled could repair a canoe on the trail with materials on hand."

Not all North American Indian tribes built and utilized the canoe, but among those that did, shapes varied according to use and tradition (see sketches here and on the following pages). However, construction and materials varied little, as shown on the next page.

The few craftsmen who build bark canoes today adhere to the old, hand-building ways and materials as much as possible. That's why Jack can ask $125 per foot for his. That's also the reason his buyers—often professionals from fields such as archaeology—wait two years for delivery and pay freight.

From a sea of birch, few trees are chosen

Indians frequently made canoes with the bark of other trees—spruce, elm, chestnut, hickory, basswood, and cottonwood, for example. But these were only substitutes for bark from the paper, or canoe, birch (Betula papyrifera). In the days of the fur trade, large birch trees dotted the northern portion of the continent, and native canoe makers often lifted the bark from a single tree to sheathe a craft.

(Note: Stripping the outer bark from a standing birch tree does not kill it. However, the area of the removal eventually fills with blackish scar tissue, never regaining its chalk-white bark.)

Continued
"If you can't split cedar, then you're not going to build a canoe," Jack says. After hauling the cedar home, he hand-splits and resplits the white cedar billets for the planking until each piece measures $\frac{3}{8}$" in thickness.

For one canoe, Jack pulls a total of 300' of black spruce root from under the floating moss of a bog. Each root runs 5'-15' long. Debarked and split, the root makes about 500' of pliable, yet strong and durable 'thread' for joining the bark.

When warm June and July weather makes the sap run, birch bark peels easily. Atop a 6' homemade ladder, Jack makes a lengthwise slice down the trunk. With the blade-point, he starts the peel. Once started, the bark sometimes seems to pop off the tree.

"I mate the bark by thickness on the sides so the pieces won't fight and askew the canoe," explains Jack. "And, I overlap the seam edges toward the stern." For the seam lacing shown here, Jack drills $\frac{3}{8}$" holes $\frac{7}{8}$" apart in the bark, then weaves in the split spruce root.
THE BARK CANOE

In the 20th-century forest, Jack faces a different set of circumstances. The sea of second-growth birch from which he gathers bark runs small in diameter, so several trees contribute to a canoe. And, the trees grow in scattered stands.

"On one trip to the woods, I'll see maybe 150 birch trees," Jack notes as he trods the logging trail bordering the forest. "From those, I'll look at 25-30 up close, then maybe only five will be fit for peeling. Averaging it out, the bark for a single canoe probably comes off a square mile of birch trees."

The woods-wise craftsman snaps his cap brim, waves away a pesky gnat, then glances to a birch's first branch. Eyeing it down, he cites some of the specifications: "I must have one that's at least 18" in diameter and straight. If I get one with a bow in it, the bark won't behave when I fold or work it."

Weather influences much of Jack's canoe building. Bark-peeling, for example, requires warm temperatures because sap flowing under the bark aids stripping. In northern Minnesota, barring cold snaps, prime time starts about mid-June and lasts until the end of July.

On the building bed, Jack and his son, Dave, raise the sewn-up, birch bark skin to the shape they want, secure it with braces, and lash on the gunwales. Indians, however, worked on the ground, using stakes to hold up the bark sheathing.

Inside the canoe, cedar planks laid end to end cover the bark and protect it. Jack uses no fasteners or adhesives. Tension from the canoe's ribs will hold the planks tightly in place.

To make the ribs pliable for insertion, Jack steams them in a mortar-like tube outside the shop. Then, he and Dave bend, set, trim, and insert each rib in the gunwales along the canoe's length.

WRITE FOR CANOE INFORMATION
For a brochure describing Jack's birch bark canoes and current prices, send $1 and a self-addressed, stamped, business-sized envelope to:

Jack Minehart, Bigfork Canoe Trails,
3016 Neola St., Cedar Falls, IA 50613.
coinciding with the annual muster of biting blackflies, munching mosquitoes, and toothy ticks.

**Materials that come home to water**

"All a canoe's materials are at home in dampness, and should be kept that way," advises Jack. "Dry out a bark canoe and it's ruined. The Indians filled theirs with rocks and sank them for the winter."

To make his point, he parts the tall weeds behind his shop to reveal the remains of two bark canoes sent to him for repair and restoration. Split, spotted, and decayed, the once-grand craft lie as if awaiting a decent burial. "Too late," he mumbles. "Museum curators varnished them. Material couldn't breathe or soak up moisture. A real mistake."

Jack disdains those who would abuse a bark canoe. Considering the effort that goes into collecting the materials—about five good-weather days of the 10 it takes to complete a canoe—you can't blame him. In addition to the birch bark—about 19 pieces for an average 16' canoe—he requires a pile of goods from the lowlands.

In a full morning's sloshy work, Jack pulls 300' of black spruce root from a bog for lacing and lashing. Then, there's the freshly felled white cedar he hand-splits for planking, ribs, gunwales, and the curved stems at bow and stern. Even the bit of strong and pliable basswood bark he uses for protective wrapping requires a lengthy harvest time.

Gathering these natural materials sometimes includes peril. Like the time Jack lost his lapel compass on an overcast day and found his way out of the woods with his nose.

"After hours of trudging, I caught the scent of a barbecue," he says, chuckling. "I followed my nose until I walked out in a campground only a couple of miles from my cabin, but nine miles and six hours from where I entered the woods!"

**Canoes draw their strength from within**

"The real strength and structure of the bark canoe come from its cedar components—the stems, gunwales, ribs, and planking. Without these, the boat would simply be a formless roll of bark, no more humanly useful than a buffalo-skin teepee without its supporting poles," Jack explains, glancing at the shimmering golden bark of the new, 50-pound, 16' Chippewa-style canoe resting nearby. With the help of his visiting son, Dave, a coastguardsman stationed in Baudette, Minnesota, Jack raised, planked, and ribbed the bark skin in a weekend.

To Jack, the bark sheathing provides more than a tough, waterproof covering. It's beautiful. "That always hits me when the canoe starts to shape up on the building bed," he notes, running his hand across a stray piece of bark. "Just prior to inserting the planking and ribs, the white side of the bark glows from within the boat. On the outside, in contrast, the backside of the bark looks like fresh buckskin. I can't help being moved by the sight."

In a decade of making canoes, that sight has warmed Jack about 35 times—once for each canoe he's labored over. He does, though, look to the future and many more "love-at-first-sightings." That's when he lays aside his high-school history books in retirement and occupies his lakeside shop full-time, building birch bark canoes.
Try it once and you’ll be blown away

Here at WOOD magazine we’ll experiment with most any technique, woodworking or otherwise, that we think will interest our readers. After discovering what a sandblaster can do (see some of our results at right), we couldn’t wait to show you how to utilize this machine in your shop. So get out those air compressors—and get ready to blast off!

How to talk like a master blaster

Have you ever noticed that every time you try a new subject area, the first thing you run up against is a lot of terminology you don’t understand? We have! Sandblasting has its share of mysterious words, too, so here are some key definitions.

Abrasive—You’ve probably heard sandpaper referred to as an abrasive. In this case, the word refers to the tiny particles (sand or other fine, gritty materials) sprayed through the sandblasting gun. Abrasives chip away at the work surface to produce the desired effect. See the chart on page 36 for a list of abrasives.

Carving—By concentrating a stream of abrasive at one spot, you can lower or "carve" the surface of wood or glass.

Etching—Also called surface etching, this process requires light, even sandblasting of glass or brass to give it a frosted look.

Siphon-fed sandblasters—Selling for less than $100, these widely available systems have two hoses leading to the gun: an air-supply hose from a compressor and a sand-supply hose hooked to the abrasive tank. You can purchase a reliable unit for less than $100.

Pressure-fed sandblasters—These units send abrasive under pressure from a tank to the sandblasting gun. They cost $300–$800 and cut faster, while using less air, than a siphon-fed sandblaster. You need this type of sandblaster only if you intend to carve glass or do sandblasting on a regular basis.

Resist—Any material that blocks the stream of abrasives from selected areas of a surface, leaving those sections unetched or uncarved.

Sandblasters throw abrasive every which way, so try a setup like the one shown above on your driveway or lawn. Because these sandthrowing machines require a lot of air, hook them to a compressor of at least 2 hp and 20-gallon capacity.

For safety and comfort, wear face protection, a long-sleeved shirt, and gloves. Since blasting with any type of sand produces airborne silica dust, wear a dust-mask respirator when spraying these abrasives.
GLASS:
DISCOVER THE ENDLESS POSSIBILITIES

Like you, we're woodworkers at heart. But before we sandblast wood, we'd like to fill you in on the basics of working with glass. As we found out, you can achieve an almost unlimited variety of stunning effects and designs with this versatile material. Just remember not to use tempered glass—it could shatter during sandblasting.

Choosing and working with the right resist
To make sure you get off on the right foot, take a look at the chart at right to select the correct resist. As you can see, all of the resists except tempered hardboard work with glass. Then, follow these tips for adhesive-backed resists:

Opaque resists: These vinyl or rubber materials take the most time to prepare, but also give you the most accurate hand-cut reproductions of your pattern. For example, a geometric pattern such as the windowpane design on page 36 requires an opaque resist. To use these materials, try the method at the top of the following page.

<table>
<thead>
<tr>
<th>RESIST</th>
<th>THICKNESS</th>
<th>USES</th>
<th>COST</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clear vinyl</td>
<td>8–11 mils</td>
<td>Glass or brass etching</td>
<td>$0.70–$2 per sq. ft.</td>
<td>Self-adhesive. Allows you to place pattern under glass and trace the design with knife. 8 mil adequate for normal etching.</td>
</tr>
<tr>
<td>Opaque vinyl</td>
<td>4–11 mils</td>
<td>Glass or brass etching</td>
<td>$0.70–$1.25 per sq. ft.</td>
<td>Self-adhesive. Because pattern must be adhered to resist, this material gives a more exact reproduction of pattern. 6 mil adequate for normal etching.</td>
</tr>
<tr>
<td>Rubber</td>
<td>40–45 mils</td>
<td>Glass etching or carving, brass etching, woodcarving, boring holes in glass.</td>
<td>$1–$2 per sq. ft.</td>
<td>Self-adhesive. Easy to cut. Holds up to heavy blasting.</td>
</tr>
<tr>
<td>Photo masking</td>
<td>4–5 mils</td>
<td>Glass or brass etching</td>
<td>$0.10 per sq. in.</td>
<td>Self-adhesive. Stock designs available. Custom masks available, using your artwork.</td>
</tr>
<tr>
<td>Tempered hardboard</td>
<td>¼&quot;</td>
<td>Woodcarving</td>
<td>$8–$10 for a 4x8' sheet</td>
<td>Inexpensive. Same template can be reused. You must nail or tape template to work surface for every usage.</td>
</tr>
</tbody>
</table>

Continued
First, transfer the design to a sheet of plain paper. Next, cover the glass surface with a piece of the resist, avoiding as best you can any air bubbles underneath the vinyl or rubber materials. (The resist will be weaker in the areas of the bubbles, so pop them with a knife point and flatten again.) Then, place the design on top of the resist and align and tape it along one edge of the glass as shown in the drawing above. Affix the pattern to the resist with a spray adhesive. With an X-acto knife in hand, carefully cut the design through the resist. Finally, peel away the resist with the help of your X-acto knife.

**Clear resists:** These vinyls save you some work by not requiring you to adhere the design to the top of the resist. You simply apply the see-through resist to the top surface of the glass, then slide the design under the glass according to the drawing above. Then, tape the design in place beneath the glass. With an X-acto knife in hand, carefully cut the design through the resist. Finally, peel away the resist with the help of your X-acto knife.

**Photo masks:** To make a photo mask of your design, a supplier will transfer the design to a piece of photosensitive resist. The cost to you: the price of a photo positive of your design, plus an initial setup fee of about $20. That may sound expensive, but photo masks pay off if you intend to do several pieces of work with the same design. Why? You need only wet the backside of the mask, apply it, and that's all—you're ready to sandblast. The sandblasting supplier on page 39 provides this service as well as stock photo-masked designs.

**How to etch, bore into, and cut glass**

With the resist applied and cut, you've done all the hard work. Now, it's time for the fun part. To etch glass, first prop the workpiece on a small workbench. Set your compressor pressure according to the chart below and load your

<table>
<thead>
<tr>
<th>QUICK GUIDE TO 4 SANDBLASTING APPLICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>APPLICATION</td>
</tr>
<tr>
<td>Carving wood</td>
</tr>
<tr>
<td>Weathering paint on wood</td>
</tr>
<tr>
<td>Etching glass or brass</td>
</tr>
<tr>
<td>Boring holes in glass</td>
</tr>
</tbody>
</table>

**NITTY-GRITTY ABRASIVE FACTS**

<table>
<thead>
<tr>
<th>ABRASIVE</th>
<th>APPLICATIONS</th>
<th>COST</th>
<th>COMMENTS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Fine white silica sand</td>
<td>Glass, wood, brass</td>
<td>$6–$8 per 100 lb.</td>
<td>Best for all-around use if you have no means of retrieving abrasive. Use respirator.</td>
</tr>
<tr>
<td>Common river or beach sand</td>
<td>Wood, glass</td>
<td>$4–$5 per 100 lb.</td>
<td>Abrasive must be clean and free of debris. Use respirator. Cuts slightly slower and creates rougher texture than fine white silica sand.</td>
</tr>
<tr>
<td>Aluminum oxide</td>
<td>Glass, brass</td>
<td>$1–$3 per lb.</td>
<td>Use only if abrasive can be recycled. Retains sharpness through repeated applications.</td>
</tr>
<tr>
<td>Silicon carbide</td>
<td>Glass, brass</td>
<td>$1.50–$5 per lb.</td>
<td>Available in very fine grits. Economical only if abrasive can be retrieved and recycled. Best retention of sharpness through repeated applications.</td>
</tr>
</tbody>
</table>
sandblaster with abrasive. We suggest using the finest white silica sand you can find (similar to the white sand often found in ashtrays). If your local homecenter or hardware store doesn't carry this abrasive, look under sandblasting in the Yellow Pages. See the chart at the bottom of the previous page for more abrasive information.

Now, move the sandblasting gun in sweeps across the glass surface as shown below. Be sure to overlap your sweeps, and check periodically for evenness of the frosting effect. That's it! Just peel away the resist to reveal your work of art. The same method works with brass. (We etched the soccer ball onto the plaque on page 35.)

To bore holes in glass, or cut the material into various shapes, concentrate a stream of abrasives in one area until it cuts all the way through. To make the butterfly ornament on page 35, first etch the inner-wing design, then cut away the butterfly from a pane of glass as shown below, middle. Because stained glass cuts slowly due to its hardness, adjust your compressor to 90–100 psi for effective results.

Etching flashed glass: A colorful alternative

Although flashed glass looks like stained glass at first glance, sandblasting the flashed variety quickly reveals that it's colored on only one side. By etching the colored or "flashed" side, you can create brilliant designs such as the one above. Many stained-glass shops sell flashed glass, but remember to keep these important points in mind:

- You'll pay a handsome price for flashed glass: about $15 per square foot. So, practice on other glass before trying the flashed variety.
- You must apply the resist to the flashed side. Normally, the flashed side is opposite the side that has tiny bubbles near the surface.

Air erasers: The tool for small blasting jobs

If you only want to etch an occasional small project, here's a lightweight "sandblaster" that you can use in the comfort of your shop. The Paasche AEC-K air eraser won't cut glass or carve wood, but for $77, it lets you etch glass or brass with even the smallest of compressors. Instead of spewing out sand, the air eraser requires small amounts of aluminum oxide. Six ounces of the abrasive will etch 10 or so glasses. For a source, see the handy Buying Guide on page 39.

Paasche air eraser

With a sandblaster, you can cut intricate shapes precisely and quickly.

Wood Magazine    April 1990

Continued
What to know before you blast wood

Although similar to the process for etching glass, carving in wood does require you to pay attention to the grain pattern of the workpiece. As shown in the two examples at right, sandblasting removes the softest grain first, giving dramatically different results on face and edge grain. We had good success sandblasting redwood and cedar—two ideal woods for outdoor signs—but had little luck carving hardwoods. Remember, the harder the wood, the more time and abrasive you’ll spend carving it.

One slick way to make a sign

We don’t know of any sign-making technique that’s easier to control—or produces more impressive results—than sandblasting. And there’s more than one way to go about it. One way: Apply and trace your pattern onto a piece of rubber resist just as you would do with glass. That works fine, but here’s a less expensive method. First, transfer your pattern to a piece of tempered hardboard. With a scroll saw, cut out the areas you want to blast. Then, apply cloth-backed, double-faced tape to the backside of the hardboard resist and adhere this assembly to the surface of your workpiece as shown at right, middle. You could nail the hardboard in place, but keep in mind that this will leave small brad holes in the work surface. To make the welcome sign on page 39, first paint the entire surface, then apply the resist, and cut along the pattern edges to remove the unnecessary tape as shown at right. Finally, sandblast the unprotected areas to a depth of about 1/4”. Work the blasting action into all the tight areas.
How to achieve the weathered look
After carving the welcome sign, we kept our handy sandblaster nearby for the final touch: a two-minute weathered look. Here’s how you can achieve the same effect. First, keep in mind that the natural causes of weathering—rain and sun—strike objects at high angles, so hold your sandblasting gun at a 45°-60° angle above the sign. Then, give the sign a light overall blasting. Finally, give a little extra blasting to the edges most likely to take a beating from Mother Nature.

Buying Guide
• Paasche AEC-K air eraser kit with six ounces of abrasive, $76.95 ppd. from The Art Store, 600 Harding Road, Des Moines, IA 50312.

Further reading and sandblasting supplies
• Glass Etching: Surface Techniques and Designs, by Norman Dobbins & Debra Felberg Oxley, $15.45 ppd. This book, instructional videos, seminars, and a complete line of sandblasting supplies (including photo masks, abrasives, resists, sandblasters, and air erasers) available from National Sandblast Systems, 20721 Marilla St. Chatsworth, CA 91311. Call 818/341-0301 for more information. Call 800-332-3824 for orders only. 

Written by Bill Krier
Technical consultant: James R. Downing
Photographs: Jim Kascutas
Illustrations: James R. Downing, Kim Downing, Mike Henry

Have a blast with these Free patterns
To help you get in on the fun of sandblasting, we’d like to send you a set of patterns for the drinking glasses, welcome sign, roses, and butterfly shown in this article. Just send us a stamped, self-addressed, No. 10 business-sized envelope to: What a Blast! WOOD Magazine P.O. Box 11454 Des Moines, IA 50336-1454

Foreign readers, please include an international reply coupon.
SANDBLASTED WALL CLOCK

JUST IN THE

Have some fun with this project! Blast away the numbers for the classy clock shown at left. Or, blast and paint the background and make your own wooden hands for the clock shown below left.

Note: Unless you’re already familiar with sandblasting, refer to our techniques article starting on page 34. It provides helpful suggestions for masking the surface and blasting the mirror for this clock’s face. For ease in masking the mirror, order our precut vinyl resist.

Miter-cut the pieces, and form the frame

1. Cut a piece of stock (we used pine) to 1 1/2 x 1 1/2 x 38". Follow the two-step drawing below right to miter-cut the 12 frame members 2 7/8" long. (We first cut and dry-clamped 12 pieces from scrap to check the angle.)

2. With a band clamp, glue and clamp together the pieces with the top and bottom surfaces flush.

3. Remove the clamp and sand the top and bottom surfaces flat.

4. Tape the frame to your workbench as shown in the photo right. Mark lines across the scrap block to locate the center as shown.

5. Using trammel points, mark a 10 1/4"-diameter circle for the outside frame perimeter and an 8 1/4"-diameter circle for the inside.

6. Bandsaw the outside of the frame to shape and use a scrollsaw to cut the inside. Sand the cut edges smooth. (We used a disc sander to sand the outside and a drum sander to sand the inside.)

7. Rout a 1/8" round-over along both front edges of the frame. Switch to a 1/4" rabbeting bit, and rout the back inside edge of the frame to house the clock face (mirror). Then, have a 1/8"-thick mirror cut to fit the rabbeted opening.
Finish the frame and blast away
1 Hand-sand the frame smooth and finish as desired. (We left ours natural and applied several coats of spray-on lacquer.)
2 Clean the silvered side (back side) of the mirror. Find the center of the mirror and mark a center-point. With a hobby knife, cut around the marked hole at the center of the resist, and remove the center from the resist (see the Buying Guide below right for our resist source). Slowly peel the backing (brown paper) from the resist. Peel the resist slowly to prevent the numbers and background from sticking to the backing. Center the resist over the mirror's centerpoint, smooth out any bubbles, and adhere the resist to the silvered side of the mirror.
3 Center and tape a 3/8" flat washer over the hole in the resist. (The washer allows you to blast through the mirror without destroying the resist and making the shaft hole too large.)
4 Sandblast a hole through the mirror at the washer (it took us approximately 4 minutes at 100 psi.). Insert the clock shaft through the hole to check for a good fit, and blast more if necessary.
5 For the painted clock face (the clock with wooden hands), remove the background resist and leave the numbers adhered to the mirror. For the unpainted clock, remove the numbers and leave the background. Sandblast the unprotected areas.
6 For the painted version, resaw pine stock to 1/4" thick. Transfer the hand patterns below left to the thin stock. Drill a 3/16" hole in each hand where marked. Using a scroll saw, cut the hands to shape. (To prevent splintering, we taped the pine stock to 1/4" hardboard with double-faced tape. After cutting the hands to shape, we removed the hands from the hardboard by splashing a bit of lacquer thinner onto the taped joint to release the wooden hands from the tape and hardboard.)
7 Trim the metal hands where shown on the Exploded-View Drawing. Epoxy the wood hands to the front of the metal hands and attach them to the shaft. Fasten the movement to the mirror and attach the hands. (You'll need to trim about 1/2" off the ends of the black hands for the unpainted clock.)
8 Using hot-melt adhesive or silicone sealant, secure the mirror into the rabbed frame.

Buying Guide
- **Vinyl resist.** Peel apart resist with pre-cut numbers. $6.25 each, or two for $10.45 ppd. Herrington Display Ltd., 1312 Maple, West Des Moines, IA 50265.
- **Clock movement.** High-torque movement with black hands, kit no. 71043, $15 ppd. Klockit, P.O. Box 636, Lake Geneva, WI 53147. Or, call 800-556-2548 to order. ♦

Project Design: James R. Downing
Photographs: Hopkins Associates
Illustrations: Kim Downing; Bill Zauf
CHICAGO-AREA REFINISHER BILL AITCHISON

THE EVER-CLEAR,

After 30 years of painting and furniture finishing, Bill Aitchison, 50, could see the writing on the wall. His mind spun and his body reeled following every bout in the spray booth with traditional, petroleum-based, nitrocellulose lacquer. “My body was really telling me something,” the Bedford Park, Illinois, craftsman recalls. “I got sick of being sick. I didn’t need OSHA [Occupational Safety and Health Administration] to warn me.”

He also could see the day when state and federal legislation would lower the boom on time-proven finishing methods—ones learned from his father. “I knew laws were coming down the road, like what California has done to limit emissions in the finishing industry. I had to change or quit.” (See editor’s note, next page.)

Today, even though he’s spraying more than ever, Bill doesn’t feel dizzy or nauseous, and no pungent odor pervades his workspace. In fact, he even recirculates the air vented from the booth through the shop to reduce his heating bill—without fearing explosion and fire. His finish: a water-based lacquer.

Clear quality to count on

“I started using Amity Clear Gloss after reading about it in a trade magazine. The article said it not only was safe because it was water-based, but also nonyellowing,” Bill explains. “Somewhat suspicious, I took a two-hour drive to the company’s headquarters to find out more. After a demonstration, I decided that it seemed to work.”

Back in his shop, Bill put his newly discovered product to the test. “I took pieces of walnut, oak, and maple, and cut them in half,” he remembers. “Next, I put them on the spray table and made one pass with the nitro-cellulose. Then, I let them dry, sanded them, and put down a finish coat.”

△ Furnace filters shield the fan in Bill’s spray booth. Although OSHA requires that a mask be worn, and the manufacturer recommends it, Bill sometimes leaves it behind because water-based lacquer isn’t toxic and has little overspray.

▲ Air pressure affects the spraying of water-base lacquer, so Bill must occasionally check the material’s viscosity by seeing how fast it flows.
FINDS HAPPINESS WITH WATER-BASED LACQUER NEVER-FEAR FINISH

Bill duplicated the treatment using the water-based lacquer, and was dumbfounded by the outcome. "The water-based gloss had twice as much build. The company claimed that it would, but I had to find out for myself." [Amity spokesman Randy Reek says that their water-based lacquer contains 30-40 percent solids, compared to 15 percent in nitro-cellulose lacquer.]

And clarity? Bill has found water-based lacquer to be so clear that he has to account for it in staining. "People expect wood furniture to have a yellowish cast. To get that look with water-base, I have to add yellow to the stains," Bill notes.

In addition to its nonyellowing nature, Bill's favorite finish has proved tough and durable, too. "I've been spraying it for two years now, and not one customer has brought back a piece because the finish didn't hold up," he says. "And I mean tabletops that take abuse with meals and homework."

Mastering a new approach

Once he trusted the water-based lacquer, Bill embraced the system. Although he could have stuck with his conventional compressor to spray the new finish, he spent about $700 for a low-pressure turbine spraying system—one that utilizes an airflow of 90 cfm to atomize the finish rather than compressed air—to take the greatest advantage of the product's high-solid content and keep overspray to a minimum (see Buying Guide at the end of the article). An airflow sprayer lays down 80 percent of the finishing material. A traditional compressor nets about 40 percent.

He built an 8x10' spray booth, too, with the efficient but noisy sprayer turbine outside. For ventilation, he added a chimneylike flue fitted with an ordinary window fan and shielded by inexpensive furnace filters. The filters capture the few solids left in the air and keep them off the fan.

Editor's Note: In some California metropolitan air districts, Rule 1136 limits the amount of air-pollutants released by finishing products by lowering their volatile organic compound (VOC) content to 2.33 lbs per gallon. A gallon of nitro-cellulose lacquer contains from 5 to 7 pounds while a water-based lacquer such as that used by Bill has only 2.1 pounds. Similar limits have been set in other cities and states.

"Water-based lacquer is the answer to everything—your health, safety, the environment, and a real smooth piano-like finish that looks 30 coats deep."

Bill Aitchison, Bedford Park, Illinois

If you or one of your friends use a finishing system you'd like to crow about, why not drop us a line? Write to: "In Search of the Perfect Finish"
P.O. Box 11454
Des Moines, IA 50336-1454
Who knows, maybe you'll be featured in the next article.

Before spraying either the water-based sanding sealer ("That gives the gloss something to bite into") or the gloss, Bill measures how the material flows. "Atmospheric pressure affects its flow," says Bill, "so you have to check the material's viscosity [thickness or thinness]."

Bill determines viscosity by pouring a small amount of the material into a flow-out cup. With a stopwatch, he measures how fast it empties. "If the cup empties under 18 seconds, it's fine," Bill advises. "If it takes longer, then I have to thin it with water."

Atmospheric pressure affects water-based lacquer by making it flow slower, but humidity has no effect because the lacquer's a water-born material. "In high humidity, nitro-cellulose lacquer traps moisture, causing what's called blushing," Bill says. "You have to add blusher to slow drying and allow the moisture to escape. Humidity doesn't bother water-base. In fact, it seems to perform better."

All set to go, Bill switches on the ventilating fan and begins laying down lacquer. "I usually put on three or four coats," he notes, "but that doesn't mean laying down a coat and letting it dry, then spraying another coat. With this stuff, you spray on wet coats. I make a pass, then do it again, then do it again. And, if I have a big run or something, I just take a sponge and water and wash it off. That is, if I repair it within two minutes, because it sets up in three minutes, hardens in an hour, and takes four days to cure."

Cleanup may be the part of spraying that irks craftsmen the most. Yet, to Bill, it's a snap. "I just walk over to the deep sink and rinse the gun out with warm water. Then, every month or two, I'll take the nozzle apart and soak it in regular lacquer thinner to cut the buildup. But it couldn't be easier."

Buying Guide

For information and dealers of the Amity line of brush-on, spray-on water-based finishes and sprayers, write Amity, P.O. Box 148, 1571 Itroy Drive, Sun Prairie, WI 53590. Or, call 800/334-4259 (Wisconsin residents: 608/837-8484). Photographs: Richard Fawerty
This Jim likes his blades thin
Jim Downing had a dilemma. To cut the deck planking for his 30-foot sailboat, WOOD magazine’s design editor had to make 3,000 feet of cuts through 18’-long, 1½”-thick teak boards. Jim knew a standard, ¾”-kerf blade most likely would bog down as he fed the hard teak material through his 1½-hp saw.

His solution: a Freud 24-tooth, thin-kerf ripping blade. “The blade made smooth cuts without heating up,” Jim says. “And the saw’s motor never pulled down. Since I cut the planking into ½” strips, the thin-kerf blade saved me a lot of stock.”

### THIN-KERF BLADES THAT PERFORM

<table>
<thead>
<tr>
<th>Style</th>
<th>Manufacturer/retailer</th>
<th>Model</th>
<th>Teeth</th>
<th>Kerf (inch)</th>
<th>Smoothness of cut</th>
<th>List Price</th>
<th>Selling Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crosscut</td>
<td>DML</td>
<td>Ultra-Thin DT 1000</td>
<td>80</td>
<td>¾</td>
<td>★★★★</td>
<td>101.00</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Forrest</td>
<td>Woodworker I</td>
<td>60</td>
<td>¾</td>
<td>★★★★</td>
<td>162.00</td>
<td>97.00</td>
</tr>
<tr>
<td></td>
<td>Freud</td>
<td>LU98M</td>
<td>60</td>
<td>¾</td>
<td>★★★★</td>
<td>73.90</td>
<td>52.00</td>
</tr>
<tr>
<td></td>
<td>Systi Matic</td>
<td>Thin Line 10PT60-050TL</td>
<td>60</td>
<td>¾</td>
<td>★★★★</td>
<td>92.00</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Woodcraft</td>
<td>07L62</td>
<td>50</td>
<td>¾</td>
<td>★★★★</td>
<td>64.50*</td>
<td></td>
</tr>
<tr>
<td>Rip blades</td>
<td>Forrest</td>
<td>Woodworker II-Thin Line</td>
<td>30</td>
<td>¾</td>
<td>★★★★</td>
<td>135.00</td>
<td>81.00</td>
</tr>
<tr>
<td></td>
<td>Freud</td>
<td>LU87M</td>
<td>24</td>
<td>¾</td>
<td>★★★★</td>
<td>59.90</td>
<td>42.00</td>
</tr>
<tr>
<td></td>
<td>Oldham</td>
<td>Roadrunner</td>
<td>36</td>
<td>¾</td>
<td>★★★★</td>
<td>41.35</td>
<td>N/A</td>
</tr>
<tr>
<td></td>
<td>Systi Matic</td>
<td>Thin Line 10HR20-050TL</td>
<td>20</td>
<td>¾</td>
<td>★★★★</td>
<td>50.75</td>
<td>N/A</td>
</tr>
</tbody>
</table>

1. List prices. Actual selling prices 10-50% lower

**MANUFACTURERS LISTING:**

- **DML**
  - 800-233-7297
  - In Ky.: 502/557-5552

- **Forrest Manufacturing**
  - 800-733-7111
  - In N.J.: 201/473-5236

- **Freud**
  - 800-234-4107

- **Oldham/U.S. Saw Co.**
  - 800-628-8000

- **In N.Y.:** 716/779-8588

- **Woodcraft**
  - 800-225-1153

- **In W.Va., Alaska, and Hawaii call 304/428-6986**

* Postage-paid price
HERE ARE THE BLADES THAT PRODUCE THE THINNEST AND CLEANEST CUTS

If you’re looking for a way to get more power from your tablesaw, then let a thin-kerf blade to come to your rescue. As we found out in our tests, thin-kerf blades require less power than thicker-bodied blades to make the same cuts. And, that’s especially important if, like many of us, you own a 1½-or-less hp saw that occasionally bogs down. As we began the research for this article, all but one manufacturer we contacted said, yes, they offer a 10″ thin-kerf blade in their product line. Guess what? Of the 18 blades we tested, only nine of them met our requirement that the blade produce a kerf no wider than 3/64″. (That’s why many blades don’t appear on the chart at left.) Although some of the blades appeared thin, they wobbled so much on our tablesaw that they left a kerf that was anything but thin. Experienced woodworkers often refer to this sort of wobble as run-out. To get an idea of what excessive runout does to the cut surfaces of your workpieces, see the photo above middle.

A blade with excessive runout caused the coarse edge on the ripped Honduras mahogany at left. The other edge shows the result of minimal runout from a Forrest blade in the same board.

What we uncovered in our tests
You probably don’t pull out a compressor and blow off your saw’s arbor and arbor collars when you change a blade, but we did to make our test results as accurate as possible. Then, we ran all the blades in red oak and Honduras mahogany.

As you can see by the chart at left, the more you spend on a thin-kerf blade, the better you can expect it to perform. So, we wondered what blade characteristics were common to the better-performing blades. Here’s the first thing we noticed: All of the better blades had 3 to 5 expansion slots along their rims. Manufacturers told us that because thin-kerf blades have less body mass to absorb heat, they need slots to help the blade expand and cool. As the photo at top right shows, Freud and Systi Matic have built additional innovative solutions into their blades. Freud’s thin-kerf blades also have a friction-reducing Teflon coating. Systi Matic lasercuts cooling slots into the saw’s body to prevent overheating.

In the final analysis, we felt the Forrest blades produced the best cuts, and that’s not surprising considering their relatively high prices. If you want smooth cuts, and the thinnest kerf possible, the Systi Matic blades produced the only 3/64″ kerf in our tests. The Freud LU87M ripping blade performed well also, and seemed to cut with the greatest ease of all the blades.

Do you need a thin-kerf blade? Improved manufacturing procedures, such as laser-cutting the blade bodies, and higher-quality materials, have increased the quality of all blades. Thanks to these innovations, thin-kerf blades now produce the kind of clean cuts that woodworkers expect. In fact, most manufacturers we spoke to anticipate that these blades will make up an ever-growing percentage of their sales. However, keep in mind that these blades won’t take the kind of abuse that thicker-bodied blades will. As Keith Deitrich, an engineer with Systi Matic, told us, “You wouldn’t take a $50,000 Mercedes into four-wheel country, and you can’t use an 80-tooth thin-kerf blade for ripping 2″-thick oak without some damage to the blade.”

Stabilizers: A helping hand for any blade
Forrest stabilizers improve the performance of thin-kerf and full-bodied blades alike.

Along with their blades, Forrest and DMI, sent us samples of their stabilizing collars. Both manufacturers told us that the collars reduce runout and blade noise. After testing these thin metal discs, we agree. Both of the products improved the performance of low- and high-quality thin-kerf blades.

Forrest sells 4″, 5″, and 6″ single discs that you slide onto the saw’s arbor between the blade and arbor nut. DMI sells the discs in pairs in 4″ and 6″ sizes. DMI suggests mounting one stabilizer on each side of the blade. For these handy gadgets, you’ll pay $21-$25 for a single Forrest stiffener and $12-$16 for a pair of the DMI collars.

Written by Bill Krier
Technical Consultant: Bob Yapp
Photographs: Hopkins Associates;
Bob Calmer
Readers who tour the WOOD® magazine offices love to peek at projects we’re preparing for upcoming issues. When Terry Edens of Davenport, Iowa visited us in August and spotted our dollhouse he said, “Boy, that’s just what I’ve been looking for! My kids have said that the granddaughters don’t have room for a dollhouse that they’d have to keep out all the time. But this is perfect. When can I start building?” Sorry to keep you waiting, Terry. But it takes time to verify all the dimensions, illustrations, and how-to instructions in our projects. I hope you and others have as much fun building this as we did. And, when playtime is over, all the pieces fit neatly into the handy case.

Note: See the Buying Guide on page 55 for our source of plans for the dollhouse furniture shown.

Call the framing crew to erect the walls
1 Using the dimensions on the Parts View Drawing on page 53, lay out the dollhouse front (A), side walls (B), partitions (C), and second floor (D) onto a 4×8 sheet of ¼"-thick birch plywood. Refer to the Cutting Diagram shown on page 53 for positioning the pieces on the plywood. Be sure to mark the window openings, door openings, and slots on the six pieces as you lay them out.
2 With a utility knife and a straightedge, score all of the lines you just marked. Doing this will minimize splintering when you cut out the pieces. Using a jigsaw fitted with a fine-toothed plywood-cutting blade, cut the parts to shape.
3 Drill blade-start holes, and cut the openings and slots to size. Check the fit of the mating parts in the slots; adjust if necessary.
4 Cut the roof (E) to the size listed in the Bill of Materials.

And now, add the trim
1 Cut the columns (F), window shutters (G, H), and door shutters (I) to the sizes listed in the Bill of Materials. Sand the edges smooth.
2 Glue and tape the columns and shutters in place (we used spring clamps and masking tape to hold the pieces until the glue dried). Note the position of the outside columns where shown on the Hinge Detail in the lower right-hand corner on the opposite page.
3 Cut the front door (J) to size, and set it aside for now.

Assemble the pieces for home sweet home
1 Insert the partitions (C) into the slots in the second floor (D).

Continued
DOLLHOUSE

PARTS VIEW

CHIMNEY

STAIRCASE

1/4" hole 1/2" deep, centered from side to side

1/4 X 1" bolt with head cut off

LEFT WALL

SHUTTER

CHIMNEY

RIGHT WALL

WOOD MAGAZINE   APRIL 1990

48
**INDEX**

Cumulative index for issues 25-32

If you keep back issues of *WOOD* magazine for future reference—as many of our readers do—save this index in a special spot. The index appears in the center of the magazine so you can remove it. We've tried to keep the index easy to use. For example, after the subject “Bench planes,” you'll see the number 29:38-43. This means the article appears on pages 38 through 43 of issue 29. You'll find the "Project Index" on page 51 helpful in locating all the projects in these eight issues.

The index for *WOOD* issues 1-8 appeared in issue 9 (February 1986); 9-16 in issue 17 (June 1987); 17-24 in issue 25 (October 1988).

**A-C**

Arrows, 27:5, 51
Associations:
Antique Woodworking
Power Tool Association
(AWPTA), 32:124
Wood action groups, 31:93
Ball, wooden, drilling holes in, 30:74
Bandings, installing, 26:47
Band saws:
blades, 32:78-79
Cool Blocks for, 25:84
resawing with, 27:89
Basket, woven, 31:78-81
Beech, 31:98
Beech wax/oil mixture, 28:36-37
Belt buckles, 25:10
Belt sanders:
beats, 28:76, 30:14
buymanpship:
portable, 30:54-59
stationary, 28:58-63
uneven pattern, curing 30:80
using, 25:55
Benches, woodworking:
hold-downs for, 32:18
long-stock support for, 31:14
Bench hook, 26:16, 27:38
Bench planes, 29:38-43
Big Tree program, 29:74-77
Bill/key keeper, 25:77-79
Birdhouses, guidelines for, 28:78-80
Boats and boatbuilders:
hydroplane, 29:112
San Diego, 26:52-55
Boats, cut threads on, 25:19
Bowls, 26:63
design guidelines, 28:54-57
reinforcing lip of, 30:22

**B-C**

Bows (Continued)
sanding on lathe, 26:24
stack-laminated, 28:26-35, 74, 31:12
stave, 28:10, 11, 29:12
by Weston, Neil, 25:34-37
Bows, 27:42-45, 51
Briar wood for pipes, 26:38-41, 27:12
Brushes:
storing, 29:18
use of, for stripping, 31:18
Bud vase, laminated, 29:72-73
Build-a-Toy contest, 32:16-17
Buymanship, 29:6
band saw blades, 32:78-79
belt sanders:
portable, 30:54-59
stationary, 28:58-63
circular saws, portable, 27:64-69
joiners, 31:66-71
rip fences, 29:65-69
scroll saws, 28:38-39
tablesaws, 32:56, 69-73
vacuums, shop, 26:56-61
Cabinets, cleanup work on, 30:34-37
California laurel, 32:37
Caliper-setting gauge, 30:20
Canada U.S. Free Trade Agreement, 31:8
Carvers:
Baier, Al, 26:38-41
Club list, 27:116, 32:124
Hajny, Desiree, 29:56-59; 32:15
Harvey, Walter, 26:120
Mackey, Ron, 32:94
The Old Hand Ways, 29:96-97
Reifel, Harley, 26:84
Rose, Jim, 27:36, 30:10
Rushlo, Dave, 28:72
Stamp, Bruce, 30:76

**C-L**

Carving, 26:62
National Wood Carvers Showcase, 25:104;
28:46-47
pipes, briar, 26:38-41, 27:12
relief, 27:36-41, 30:10
bench hook, 26:16, 27:38
tools, 27:36, 29:63
sharpening, 27:70, 29:12
Cattail decoration, 25:80
Cedar:
for arrows, 27:45
finishing, 29:24
Center, finding, 28:18
of dowel, 31:16
of hole being enlarged, 26:18
Chair Loc, 32:28
Chains:
manufactory of, 25:40-41
repair of, 31:101, 32:28
Shaker, 30:58-45, 32:15
Cherry, 27:52-57, 31:98, 101
Chesnut, 29:37, 31:12
Chinaberry, 30:90
Chips, 27:36, 70, 29:63
Christmas decorations:
carved angel, 32:94
carved Santas, 26:84, 87
scroll-sawed, 26:68-70, 27:12
turned ornaments, 26:83
Chuck keys:
holding in place, 29:18
shield on, 27:14
Chucks, lathe, shield for, 26:30
circular-saw blades, 27:116;
28:83; 31:29
Circular saws, portable, 27:64-69
cordless, 26:33
Clamps and clamping:
bar clamps, 27:26, 30:14
Bessey K Body, 30:83
for edge-gluing jobs, 31:14
Clamps and clamping (Cont.)
edge-joined boards, 29:16
handscrews, 32:24
inlays, 26:46
laminated segments for bowl, 28:28-29
mini clothespins as, 31:16
pipe clamps, 30:14, 66-67
as bench hold-downs, 32:18
Collectible tools:
molding planes, 29:44
power, antique, 32:124
rules, folding, 26:112
Combination square as marking gauge, 30:22
Copalba tree, 32:124
Cordless tools:
Dremel Freewheeler, 26:89
recharging, 25:16
saws, 26:33
Grafts in:
Close-ups:
bows: Don Adams, 27:42-45
carvings, wildlife: Desiree Hajny, 29:56-59
cypress furniture: George Olivier, 26:64-67
duck calls: Harry M. "Butch" Richenbach, 31:56-59
knives: Walt Easley, 30:30-33
pipes: Al Baier, 26:38-41
turned bowls: Neil Weston, 26:33-37
weathered-wood scenes: Jim Shirley, 32:52-55
Cypress furniture, 28:64-67

**D-F**

Deck-building tips, 30:47, 79
Deforestation concerns, 26:13;
31:46-49, 93
Design-a-Toy contest, 26:65, 11,
27:33, 90, 31:28, 38-41
Diameters, measuring, 26:16

Continued
Disc Sanders and Sanding, 27:89; 28:11, 58–63; 31:52–53
Door, locating bind in, 26:26
Douglas fir, 28:65; 32:124
Dowel holes, locating, 32:18
Dowel jig, 25:88
Doyle: center of, finding, 31:16
glue escape, 29:14
Drafting board, 30:87
Drawers: hanging files, 25:19
scouring, 27:22
Drill press, 30:74–75
chuck key held on, 29:18
table, leveling, 26:22
Drills and drilling, 30:74–75
bits: centering, in hole, 26:18
Forstner, 30:84; 31:16
small, nail as, 26:29
spade, altering, 25:16
chuck key guard, 27:14
cordless, recharging, 25:16
for disc sanding, 31:52
marking locations for, 26:20
Drum Sanders: rulers as, 25:12
sieves for, 25:20; 29:28
Duck call, 31:56–59
Dust control, 32:12
belt Sanders, 28:60–61; 30:57–58
fans for, 26:29; 29:20, 24
shop vacuums vs. dust collectors, 26:57
Easel, tabletop, 32:86–88, 99
Edge-gluing, 29:16; 31:14
Edge-joining, 29:64
Edge jointing, 29:42
Entertainment center, modular, 29:44–49, 92
Epoxy, mixing, 30:16
Exhaust system for workshop, 29:24; 31:105
Face shields, cleaning, 28:16
Fences, saw, See Rip fences
File cabinet, 31:12
Filigree plant stand, 28:42–45
Fillers, wood, 31:103
for plywood edges, 26:24
Finishing and Refinishing: antiquing, restoring, 29:22–23
brushes, storing, 29:18
cedar, 29:24
dipping of toy parts, 26:104
gunstocks, 25:59
hollow objects, 32:24
Glue and Gluing: bottles, caps for, 32:22
caddy for, 25:68
can rim, covering, 26:16
clamming for, See Clamps
claying edge gluing, 29:16; 31:14
epoxy, mixing, 30:16
seasoned wood, 26:104
small parts, 31:54
Glue joints, breaking, 31:101
Gouges, carving, 27:36, 70
Grades of lumber, 29:90
Grinding: hollow-grinding, 29:40
with jig, 28:11; 29:40
Gunstocks, 25:56–59
Hammer, nail starter for, 27:24
Handscrews for edge work, 32:24
Hardwood questions, 29:79–85, 90–91; 31:103
Hemlock, 26:37
Humidity changes, effect of, 27:90
Import buyers, 28:40–41
Indian woodcraft, 27:51
Inlay technique, 26:42–47
serving tray, 26:48–51
Ishi (Yahi Indian), 27:51
Ivory, pink, 28:96; 30:12
J–M
Jigs:
box-joint, 27:48–50; 29:8, 27
dowel, 25:88
joiner knife-setting, 31:31
sharpening, 28:11; 29:40
Jointers:
bench plane as, 29:42
buyingmanship, 31:66–71
knife-setting jig, 31:31
knife-sharpening jig, 28:11
use of, 28:14; 31:65
Joints and joining:
box (finger), jigs for, 27:48–50; 29:8, 27
cleanup work on, 30:34–35
edge-joining, 29:64
loose, repairing, 31:31, 101; 32:28
Knives:
carving, 27:36, 70
crooked, Indian, 27:51
joiner, 28:11; 31:31
maker of, 30:30–33
X-acto, sharper for, 28:84
Koa, 27:35
Lacquers:
black, 29:23
water-based, 30:89
Laminates, applying, 27:14
Lathes:
buffing wheel for, 25:88
chuck shield for, 26:30
dust bower for, 29:20
sanding on, 26:24
tool rests for, 25:25, 28, 30
of Weston, Neil, 25:36–37
Laurel, California, 32:37
Layout tools, 25:66–67; 27:10
Lighting:
outdoor, 29:50–53; 32:10
shop, 30:14
torchere, 27:58–62
Logs and logging, 26:15; 31:48
Alphabetical hardwoods, 27:52–57
Lubricant for tools, 28:84
Magnolia, 30:29
Mahogany, 31:98
Marking gauge, combination square as, 30:22
Masking tape, removing, 30:18
Mats, cutting, 25:44–45
Measuring and marking tools:
See Tools: measuring and marking
Mesquite, 31:37
Milk paint, 25:14
Mils vs. millimeters, 31:10
Miter gauges:
checking trueness of, 31:21
setting, 27:14
Miter joints, 30:37
Molding planes, 29:34
Moldings:
cleanup work on, 30:34–35
radius, matched, 28:66–67
router, 25:12
bit for, 25:83
Motors:
piezolectric, AEG’s, 32:96
ratings, 27:92; 29:10
sawdust protection for, 29:14
speed control for, 29:27; 32:8, 10
Moto-tools, cordless, 26:89
Myrtle, 32:37
N–P
Nails:
holding, 27:24; 32:22
removing, 25:18
National Woodcarvers
Showcase, 25:104; 28:46–47
Oil:
teak, with beeswax, 28:36–37
tung, 28:66
Old Hand Ways (Roy Underhill):
The Carver’s Son, 29:96–97
The Fiddle and the Violin, 26:106, 108
Ishi, 27:51
The Old Kitchen Table, 25:22–24
Stack-laminated bowls
Issue 28 page 26

Power Tools (Continued)
work positioner for, 27:30
Pressure-treaded wood, 26:103;
30:46–47, 79
Project Showcase, 26:62–63
winning carvings, 28:46–47
Putty stick, use of, 28:18

R–S
Rabbit plane, 29:28
Rabbits for frame, 25:12, 47
Radial-arm saw safety, 26:29
Rain forests, tropical, 27:116;
31:40–47
Refinishing. See Finishing and
refinishing
Relief carving, 27:36–41; 30:10
bench hook, 26:16; 27:58
Resawing with bandsaw,
27:89
Rip fences:
rails, cushioning, 26:14
replacement, 29:65–69
smooth gliding of, 32:18
Rockwell hardness of tools,
26:110–111
Router jig for frames, 31:82–83
Router plane, 26:46
Routers, 29:112
bits:
molding, 25:83
profiles of, 30:20
removing, 30:18
stile-and-rail set, 26:87
as drum Sanders, 25:12
gauge for setting, 27:19
molding made with, 25:12
plunge, adjusting, 25:16
small pieces, working on,
31:52–53
crend speed control for, 29:27;
32:8, 10
table for, 25:14
Shaper, 30:93–95
Sanding:
for small pieces, 31:52–53
drum:
router as, avoiding, 25:12
sleeves for, 25:20; 29:28
on lathe, 26:24
small pieces, 31:51–53
storage of supplies, 28:76;
31:53
Sanding frames, 30:58
Santas, carved, 26:84, 87
Sapele, 28:23
Sassafras, 32:53
Saw dust:
control of. See Dust control
as filler for wood, 14:19
in gardens 29:23; 32:8
Sawdust (Continued)
protecting motors from,
29:14
Sawed lumber, types of, 29:78
Saw horses, uses of, 29:18
Sawmills, 27:54–55
Saws. See also Tablesaws
bandsaws, 25:84; 27:89
blade buymanship,
32:78–79
circular, portable, 27:64–69
cordless, 26:33
circular blades for, 27:116;
28:83; 31:29
circular saws, 26:29
scrollsaws, 26:16; 26:38–39
small pieces cut with, 31:50

PROJECTS
Airplane, toy, 32:90–93, 100
Angel carving, 26:42
Baja buggy, 26:74–75, 28:12
Basket, woven, 31:78–81
Bench, country, 27:72–75
Bill/key keeper, 25:77, 79
Bookends, 32:84–85
Cowboy boot, 28:72
Bowl, stack-laminated,
28:32–35, 74
Box-joint jig, 27:48–50, 29:8
Cabinets:
country, 27:76–77, 84
curio, cherry, 26:60–65
modular center, 29:44–49, 92
Candle holders, turned, 31:84
Carousel, zoom, 25:72–73, 91;
28:10–11
Cattail centerpiece, 25:80
Chair, Shaker, 30:84–45; 32:15
Christmas tree ornaments:
scrollsaw, 26:68–70; 27:12
turned, 26:83
Clock, wall, wenge, 26:72–73
Cradle, doll, 30:60–65
Cribbage board, 26:80–82
Depth gauge, 26:78–79
Desk, tambour-topped,
32:44–51
Duck pull toy, 31:42–45, 88
Easel, tablet top, 32:86–88, 99
Entertainment center,
modular, 29:44–49, 92
Father Christmas carving,
26:86
Fisherman’s rod rack, 30:68–70
Glue caddy, 25:68
Grape leaf carving, 27:38–41
Lighting:
outdoor, 29:50–53; 32:10
torchère, 27:58–62
Mirror, wall, 32:80–83
Mobile, parrot, 29:82–83, 86;
32:12, 15
Napkin holder/shakers,
29:80–81
Napkin rings, 25:50
Notepad holder, 26:76–77
Oval marker, 25:48–49
Perfume decanter, 26:73, 87
Picture frames, tabletop,
31:82–83, 90
Plant stand, filigree, 28:42–45
Raccoon carving, 29:60–65
Recipe card box, 27:78–79
Recipe card holder, 32:89
Rip fence, 31:60–64
Rolling pin with rack,
25:74–76
Safe, 25:77–78; 26:12
Sandar, strip, 30:71–73
Scraper, 28:68–69, 77; 31:11
Table, trestle, 28:48–53; 31:11
Tops, turned, 29:84
Torchière, 27:58–62
Treay, serving, inlay, 26:48–51
Trucks, toy, 27:80–82
Vase, bud, laminated,
29:72–73
Whale carving, 30:76
Wheelbarrow, toy, 25:70–71
Whistle, musical, 29:70–71
Woody car, model, 31:72–77
Yo-yo, 26:71

continued
Scrapers: sharpening, 26:66
Screw holds, stripped, 31:31
Screws, square-drive, 29:30
Scroll-sawn ornaments, 26:68–70, 27:12
Scrollsaws, 28:38–39
blade life, extending, 26:16
Sharpening:
carving tools, 27:70; 29:12
joiner knives, 28:11
plane cutters, 29:40
scrapers, 26:66
X-acto blades, 28:84
Sheet goods, carrier for, 31:31
Shop skills:
belt sander, using, 25:55
carving tools, sharpening, 27:70; 29:12
dye-joining, 29:64
joiner, using, 31:65
pipe clamps, using, 30:65–67
scrapers, sharpening, 26:66
Shop-tested techniques, 28:6
bench-plane basics, 29:38–43
framing of artwork, 25:42–47; 27:11; 26:14
lay, 26:62–47
relief carving, 27:36–41
small-scale work, 31:50–55
stack-laminated bowls, 28:26–31
tambour, 32:38–43
Shop-tip contest, 28:14; 29:14;
30:14; 31:14; 32:18
Shop vacuums, 26:56–61
Silicone polishes, finishes
damaged by, 31:101
Small-scale projects, 31:50–55
Spade bits, tapering, 25:16
Speakers’ bureau, 28:96
Square, combination, as
marking gauge, 30:22
Square-drive screws, 29:30
Stack-laminated bowls,
28:26–35; 74; 31:12
Stain, colored, 31:32
Stain-resist finish, 27:46–47
Stave bowls, 28:10, 11; 29:12
Stickmaker, 32:124
Stripping:
brushes used for, 31:18
Dad’s Easy Spray for, 29:28
3M Safest Stripper, 27:91;
30:12
Strip sanders, 28:59, 60; 30:14;
71–73
Switch, foot, 26:91

Table saws:
buying, 23:57, 63, 69, 73
bullnose, for, 26:103
tilter, 27:58; 31:21
narrow-strip ripping, 28:20
Powermatic, 29:94; 31:10
Reinhard, 25:104
rip fences. See Rip fences
safety guidelines for, 26:65
small pieces, cutting, 25:18
Tambour, 32:38–43
Tamo, 26:34
Tape:
double-faced, 29:12
masking, removing, 30:18
Tape measures, 27:50
Teak oil and beeswax, 28:36–37
Template enlargement, 31:14
Tenon-cutting tool, 26:88
Thicknesses of wood, 29:79,
88; 31:103
Threaded inserts, 30:10, 74
Timber:
Allegheny hardwoods,
27:52–57
trade, 28:40–41
world’s supply of, concerns
about, 31:49–50, 99
Tool companies:
AEG, 32:96
Bosch, 28:86
Chevrolette Tool, 22:60–63
foreign, low dollar and,
28:96
Japanese, with U.S. plants,
32:96
Makita, complaint by, 27:92
Powermatic, 29:94; 31:10
pronouncing names of,
26:120
Reinhard, saws from, 25:104
Ryobi Limited, 26:33
Scheppach, 31:94
Sears, 29:94
Shopsmith, 28:86;
29:112
U.S. parts, use of 31:94
Tool rests, lathes, 25:26, 28, 30
Tools. See also Power tools
buying. See Buymanship
callipers, setting, 30:20
carving, 27:36; 29:63
sharpening, 27:70; 29:12
clamps. See Clamps and
clamping
harnesses, nail-starting
attachment for, 27:24
hardness of, 26:110–111

Tools (Continued)
holders for, 26:26; 27:24
jigs. See Jigs
measuring and marking,
25:66–67; 27:10
combination square as
marking gauge, 30:22
rules, folding, 26:112
rules, marking, 27:30
for mounting artwork, 25:43
planes. See Planes
safe use of. See Safety
sharpening of. See
Sharpening
tenon cutters, 26:88
Torchère, 27:58–62
Toxic woods, 29:79; 32:74–77
Toy contest, 26:6, 11; 27:33,
90; 31:28, 38–41; 32:16–17
Treated wood, 26:103;
30:46–47, 79
Tropical forest, 27:116;
31:46–47
Tung oil, 28:66
Turners:
Burhans, Mark, 31:84
Gilmer, Myles, 27:63, 87
Lossing, Craig, 29:84
Lovelace, Bill, 28:26–27
Modo, Michael, 26:83
Nish, Dale, 28:54–55
Raffan, Richard, 28:54–55
Richenbach, Butch,
31:56–59
Talcove, Mitch, 25:50
Weston, Neil, 25:4–37
Turning. See also Bowls
duck calls, 31:56–59
imperfections, detecting,
30:22
lathe for. See Lathes
radius moldings, 28:66–67
tenon cutters for, 26:88
Vacuums, shop, 26:56–61
Vase, laminated, 29:72–73
Venceer:
cutting, 26:43; 27:20
flattening, 26:43
for furniture company,
25:40
inlaying, 26:42–47
Videos, woodworking, 26:91;
32:34
Violin repair, 26:106, 108
Vise, Multi-stop, 27:30
Warp prevention, 27:19
Warp removal, 29:43
Wax finishes, 29:54–55
beeswax/oil mixture,
28:36–37
Wheelbarrow, toy, 25:70–71
Wing nuts, loosening, 26:18
Wolmanized wood, 26:103;
30:46–47, 79
Woodcarvers and
woodworking. See Carvers;
Carving
Wood fillers, 31:103
for plywood edges, 26:24
Wood species:
Amazon rain forest, 27:116
beech, 31:98
brier, pipes from, 26:38–41;
27:12
cedar, 27:45; 29:24
cherry, 27:52–57; 31:98, 101
chestnut, 29:37; 31:12
chinaberry, 30:90
cold tolerance of, 25:104
cypress, 28:64–67
Douglas fir, 28:25; 32:124
hemlock, 26:37
identification quiz, 29:78–79
koa, 27:35
magnolia, 30:29
mahogany, 31:98
mesquite, 31:37
myrtle, 32:37
palofo, 27:85; 31:8, 10
peroba, 29:33
pine, 30:104
pink ivory, 28:96; 30:12
sapele, 28:23
sassafras, 25:33
smells of, 25:104
tamo, 26:34
toxic, 29:79; 32:74–77
ycw for bows, 27:43–44
Wood supply, world’s
correspondents, 31:46–49,
93
Woodturners and
woodturning. See Turners;
Turning
Woodworkers. See also
Carvers; Carpenters; Closeups
Abram, Norm, 30:104
butchers, 26:52–55;
29:112
celebrity, 30:48–51
Fossel, Theo, 32:124
good deeds by, 106
traditional. See The Old
Hand Ways
youth, 25:6; 32:6
Workbenches:
hold-downs for, 32:18
long-stock support for, 31:14
Work supports, 30:14; 32:27

Indexer: Barbara Klein
Bill of Materials

<table>
<thead>
<tr>
<th>Part</th>
<th>Finished Size*</th>
<th>Mat.</th>
</tr>
</thead>
<tbody>
<tr>
<td>TWL</td>
<td></td>
<td>Qty</td>
</tr>
<tr>
<td><strong>DOLLHOUSE</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A front</td>
<td>1/4&quot; 12&quot; 311/2&quot;</td>
<td>BP 1</td>
</tr>
<tr>
<td>B walls</td>
<td>1/4&quot; 12&quot; 17&quot;</td>
<td>BP 2</td>
</tr>
<tr>
<td>C partitions</td>
<td>111/4&quot; 17&quot;</td>
<td>BP 2</td>
</tr>
<tr>
<td>D second floor</td>
<td>111/4&quot; 331/2&quot;</td>
<td>BP 1</td>
</tr>
<tr>
<td>E roof</td>
<td>9&quot; 331/2&quot;</td>
<td>BP 1</td>
</tr>
<tr>
<td>F columns</td>
<td>1/4&quot; 3/4&quot; 12&quot;</td>
<td>BP 4</td>
</tr>
<tr>
<td>G shutters</td>
<td>111/4&quot; 2&quot;</td>
<td>BP 18</td>
</tr>
<tr>
<td>H shutters</td>
<td>1/4&quot; 3/4&quot; 3&quot;</td>
<td>BP 12</td>
</tr>
<tr>
<td>J door shutters</td>
<td>1/4&quot; 3/4&quot; 6&quot;</td>
<td>BP 2</td>
</tr>
<tr>
<td>J door</td>
<td>21/4&quot; 51/4&quot;</td>
<td>BP 1</td>
</tr>
<tr>
<td>K staircase</td>
<td>3&quot; 7&quot; 71/2&quot;</td>
<td>LF 1</td>
</tr>
<tr>
<td>L chimneys</td>
<td>3/4&quot; 3&quot; 181/4&quot;</td>
<td>B 2</td>
</tr>
<tr>
<td>M chimney caps</td>
<td>13/4&quot; 11/2&quot; 2&quot;</td>
<td>B 2</td>
</tr>
</tbody>
</table>

**STORAGE CASE**

| N case sides | 1/4" 31/4" 351/2" | B 2 |
| O case ends | 1/4" 31/4" 161/2" | B 2 |
| P case panels | 1/4" 20" 351/2" | BP 2 |

Material Key: BP-birch plywood
LF-laminated fir

Supplies: quick-set epoxy, three pair of 3/4 x 1" brass hinges (Stanley part no. CD5302), one pair of brass-plated chest latches with screws (Stanley part no. CD5396), 11/2 x 30" continuous hinge with screws (Stanley part no. SC311), #9 x 1" flathead wood screws, 3/4 x 3" hex-head bolt, 3/4 x 1" hex-head bolt, paint.

Cutting Diagram

1 1/2 x 7 1/4 (2 x 8) x 48" Fir, Pine, or Spruce

1/4 x 48 x 96" Birch Plywood

3/4 x 7 1/4 x 96" Birch
DOLLHOUSE

2 Position the front piece (A) face down on your workbench. Place the partition/second-floor assembly on the back side of the front piece, with the ends flush where shown on the drawing on the opposite page. Make sure, too, that the bottom edges of the partitions are flush with the bottom edge of the front piece. Cut a spacer to length, and clamp it between the partitions where shown in the drawing. (The spacer helps keep the partitions square to the front piece.) Check that the partitions are square with the front piece, and then tape the partitions to the spacer.

3 Discard the screws packaged with the $\frac{3}{4} \times 1''$ brass hinges. Then, epoxy the hinges to the front piece. (We used quick-set epoxy, and lightly sanded the hinge surfaces for better adhesion to the epoxy.) Later, epoxy the other leaf of each hinge to the partitions.

4 Repeat the process in Step 3 above to epoxy the front-door hinges to the front piece (A) and the door (J).

Two steps make a staircase

1 Cut two pieces of 2'' x 8'' to 7'' wide by 7\frac{1}{4}'' long. (When cutting the pieces to width, we ripped both edges of the 2''x8'' to get rid of the rounded-off corners of the board.) Glue and clamp the pieces together face to face for the staircase laminate (K). Using the dimensions on the Parts View Drawing and a combination square, mark the steps on the 2''x8'' laminate. With a bandsaw, cut the staircase to shape.

2 Drill a $\frac{3}{4}''$ hole $\frac{5}{8}''$ deep in the stair bottom where shown on the Parts View Drawing. Cut off the head of a $\frac{1}{4}'' \times 1''$ bolt, and epoxy it into the hole in the staircase. See the staircase on the Parts View Drawing for reference.

No mason necessary for these chimneys!

1 Transfer the dimensions for the chimneys (I, M) to $\frac{3}{4}''$ birch. (See the Parts View Drawing for dimensions.) Cut each chimney to shape.

2 Draw diagonals to find center, and then drill a $\frac{5}{16}''$ hole $\frac{3}{4}''$ deep in the top center of each chimney. (Again, see the chimney on the Parts View Drawing for reference.) Mark the angled cutlines, and cut each chimney cap (M) from the chimney (I).

3 Glue one chimney to each wall (B) where shown on the Parts View Drawing.

Next, build the case to house the home

1 Cut the case sides (N) and ends (O) to size from $\frac{3}{4}''$ birch stock.

2 With the surfaces flush, glue and clamp the sides and ends together, checking for square.

3 Measure the length and width of the case frame, and cut the two case side panels (P) to size from $\frac{3}{4}''$ plywood. With the edges and ends flush, glue and clamp the side panels to the frame. Later, sand the edges of the plywood flush with the edges of the frame. Rout or sand a $\frac{1}{4}''$ chamfer along the plywood edges where shown on the Exploded-View Drawing.

4 Drill screw holes and strengthen the joints with $\frac{3}{8}'' \times 1''$ flathead wood screws where shown on the Exploded-View Drawing. Plug the holes and sand the plugs flush.

5 Locate and mark the chimney-hole locations onto the plywood case top where shown on the Exploded-View Drawing. Drill blade-start holes, and cut the chimney slots to shape.

6 Raise your tablesaw blade $\frac{3}{8}''$ above the surface of the saw table. Position the fence $2''$ from the inside edge of the blade. As shown in the photo above right, cut the case in two. (To keep the saw kerfs from collapsing, we taped $\frac{3}{8}''$ spacers in each kerf after cutting it.) After making the final cut, remove the tape and spacers.

7 Position the case halves together with the edges and ends flush. Center the $1\frac{1}{4}'' \times 30''$ continuous hinge over the joint line along one edge, centered from side to side, and screw it in place.

Complete the construction

1 Fit the dollhouse onto the case so the chimneys slip into the chimney holes in the case panel (P).

2 Position the staircase against the backside of the front (A) and flush against the right wall (B). Use a pencil to mark the location for the bolt-mounting hole on the case top (P). Remove the staircase, and drill a $\frac{5}{16}''$ hole where marked.

3 Tape the roof (E) to the top of the end walls (see the Chimney Detail accompanying the Exploded-View Drawing for location). Mark the location of the chimney caps (M), and then glue and tape them to the top of the roof squarely over the chimney bottoms (L).

4 Remove the roof from the assembly. Using the previously drilled hole in each chimney cap as a guide, drill a hole through the roof at each chimney cap as shown in the photo on the opposite page.

5 Cut off the head of two $\frac{3}{4}'' \times 3''$ hex head bolts, and epoxy one bolt into the hole in each chimney cap (M). See the Chimney Detail accompanying the Exploded-View Drawing.
Using the previously drilled hole in the chimney cap as a guide, drill a 1/4" hole through the roof.

Drawing for reference. (We found that using a bolt is much stronger than a dowel, which has a tendency to break with heavy use.)

**Call the house painters**

1. Sand the parts and remove the latches and continuous hinge.
2. Paint the pieces with semigloss enamel. (For our house and case, we applied Rust-Oleum Wood Saver paints. After the first coat dried, we brushed the end grain with an extra coat. After that dried, we repainted all the surfaces.)
3. Now, add the trim lines on the chimney (we used a medium-point felt-tipped marker for this).
4. Attach the hardware. To store the pieces inside the carrying case, see the drawing at left.

**Buying Guide**

- **Dollhouse furniture plans.** $12.49 (U.S.) ppd. for plan no. W511 from Meisel Hardware Specialties, P.O. Box 70W4, Mound, MN 55364. ☑

Produced by Marlen Kemmet
Project Design: Dave Ashe; James R. Downing
Photographs: Hopkins Associates; Jim Kascoutas
Illustrations: Kim Downing; Bill Zain
The woodworker’s survival SCROLLSAW

A few months ago, I bought a new scroll saw. And, a couple of weeks later I had exhausted the supply of blades provided with the saw. Instead of just spending a few bucks at the local hardware store for the brand carried there, I did some research into the topic. Let me tell you, poking my nose into the scroll saw blade business provided me with a real education. Read on and I’ll fill you in.

Choose a coarseness to match the job

Ron King, who travels the country demonstrating scrollsaws for Advancery Machinery Imports (AMI), has plenty of advice on buying scroll saw blades. Of all the pearls of wisdom he passed on to me, this one really cut to the core of the matter: “Select the coarsest blade that gives a cut that’s satisfactorily smooth for your job.” Coarse blades, because of their extra width, help you cut a straighter line. Fine blades, on the other hand, cut more smoothly than coarse ones, but they also cut slower and break more often. So, it pays to test coarser blades first, then turn to finer blades as you look for the ideal type for your project.

As you can see by looking at the chart at right, plain-end blades have universal numbers, with the high-numbered blades being the pensive (about 7 cents more per blade), pin-end blades quickly slide into place for hassle-free mounting. But, I discovered that even though plain-end blades require a little more work to clamp into position, nearly all serious scrollsawers use them. And, Chuck Olson of the Olson Saw Co. tells me plain-end blades outsell pinned blades by about 20 to 1. “You can buy plain-end blades in a much greater variety of sizes and tooth configurations,” Olson told me. “And because pin-end blades have to be wider to accept the pin, they’re not available in the thin sizes necessary for intricate work.”

Choose a coarseness to match the job

Ron King, who travels the country demonstrating scrollsaws for Advancery Machinery Imports (AMI), has plenty of advice on buying scroll saw blades. Of all the pearls of wisdom he passed on to me, this one really cut to the core of the matter: “Select the coarsest blade that gives a cut that’s satisfactorily smooth for your job.” Coarse blades, because of their extra width, help you cut a straighter line. Fine blades, on the other hand, cut more smoothly than coarse ones, but they also cut slower and break more often. So, it pays to test coarser blades first, then turn to finer blades as you look for the ideal type for your project.

As you can see by looking at the chart at right, plain-end blades have universal numbers, with the high-numbered blades being the expensive (about 7 cents more per blade), pin-end blades quickly slide into place for hassle-free mounting. But, I discovered that even though plain-end blades require a little more work to clamp into position, nearly all serious scrollsawers use them. And, Chuck Olson of the Olson Saw Co. tells me plain-end blades outsell pinned blades by about 20 to 1. “You can buy plain-end blades in a much greater variety of sizes and tooth configurations,” Olson told me. “And because pin-end blades have to be wider to accept the pin, they’re not available in the thin sizes necessary for intricate work.”

Choose a coarseness to match the job

Ron King, who travels the country demonstrating scrollsaws for Advancery Machinery Imports (AMI), has plenty of advice on buying scroll saw blades. Of all the pearls of wisdom he passed on to me, this one really cut to the core of the matter: “Select the coarsest blade that gives a cut that’s satisfactorily smooth for your job.” Coarse blades, because of their extra width, help you cut a straighter line. Fine blades, on the other hand, cut more smoothly than coarse ones, but they also cut slower and break more often. So, it pays to test coarser blades first, then turn to finer blades as you look for the ideal type for your project.

As you can see by looking at the chart at right, plain-end blades have universal numbers, with the high-numbered blades being the expensive (about 7 cents more per blade), pin-end blades quickly slide into place for hassle-free mounting. But, I discovered that even though plain-end blades require a little more work to clamp into position, nearly all serious scrollsawers use them. And, Chuck Olson of the Olson Saw Co. tells me plain-end blades outsell pinned blades by about 20 to 1. “You can buy plain-end blades in a much greater variety of sizes and tooth configurations,” Olson told me. “And because pin-end blades have to be wider to accept the pin, they’re not available in the thin sizes necessary for intricate work.”

<table>
<thead>
<tr>
<th>UNIVERSAL NUMBER</th>
<th>WIDTH (inch)</th>
<th>THICKNESS (inch)</th>
<th>TEETH PER INCH</th>
<th>APPLICATIONS</th>
</tr>
</thead>
<tbody>
<tr>
<td>2/0</td>
<td>.015-.022</td>
<td>.010</td>
<td>28-30</td>
<td>Extremely intricate sawing in veneers, plastics, hard rubber, and pearl up to $\frac{3}{16}$ thick</td>
</tr>
<tr>
<td>0</td>
<td>.024</td>
<td>.011</td>
<td>25</td>
<td></td>
</tr>
<tr>
<td>1</td>
<td>.026</td>
<td>.012</td>
<td>23-25</td>
<td>Tight radius work in hardwoods to $\frac{3}{16}$ thick, softwoods to $\frac{3}{8}$, and plastics to $\frac{3}{4}$</td>
</tr>
<tr>
<td>2</td>
<td>.028-.029</td>
<td>.012-.013</td>
<td>20-23</td>
<td>Tight radius work in hardwoods to $\frac{1}{4}$ thick, softwoods to $\frac{3}{4}$, and plastics to $\frac{1}{2}$</td>
</tr>
<tr>
<td>3</td>
<td>.032</td>
<td>.013-.014</td>
<td>18-20</td>
<td>Hardwoods to 1&quot;, softwoods to 1½&quot;, plastics to $\frac{1}{2}$</td>
</tr>
<tr>
<td>4</td>
<td>.035</td>
<td>.014-.015</td>
<td>15-18</td>
<td>Hardwoods to 1½&quot;, softwoods to 2&quot;, plastics to $\frac{3}{4}$</td>
</tr>
<tr>
<td>5</td>
<td>.038-.039</td>
<td>.015-.016</td>
<td>12½-16½</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>.041-.043</td>
<td>.016-.017</td>
<td>12½-15</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>.045</td>
<td>.017-.018</td>
<td>11½-14</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td>.047-.049</td>
<td>.017-.018</td>
<td>11½-14</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td>.053</td>
<td>.018-.019</td>
<td>11½-14</td>
<td></td>
</tr>
<tr>
<td>10</td>
<td>.056-.067</td>
<td>.019-.020</td>
<td>11-12½</td>
<td></td>
</tr>
<tr>
<td>11</td>
<td>.059-.063</td>
<td>.019-.020</td>
<td>9½-12½</td>
<td></td>
</tr>
<tr>
<td>12</td>
<td>.062</td>
<td>.024</td>
<td>9½</td>
<td></td>
</tr>
</tbody>
</table>
What you need to know about tooth patterns

As you can see from the illustration at right, scroll saw blades come in five different tooth patterns. Here's a few tips on each:

- **Standard.** Sometimes referred to as a skip-tooth or fretsaw blade, these kerf-cutters easily outsell all other types. The gullet between each tooth helps clear away wood chips and cool the blade. In my hands-on testing, this blade cut faster and smoother than any other blade in ¾” stock. Available in plain-end only.

- **Double tooth.** Currently, only AMI imports these blades, but because of their rising popularity the Olson Saw Company is also considering manufacturing them. "These are AMI’s hottest-selling blades,” Ron said. In the WOOD® magazine shop, double tooth blades produced less chip-out than the other blades in materials less than ½” thick.

- **Scrollsaw.** Most often found in coarser sizes, especially in pin-end blades, these stiff blades work best in rigid-arm scroll saws. Although not recommended for smooth or intricate cuts, the wide (.250”) versions of this blade work well for straight cuts such as rips. Available with plain and pinned ends.

- **Reversed.** This new blade from the Olson Saw Company has five or six teeth at the bottom of the blade that point upward. Why? The reversed teeth reduce splintering on the underside of the workpiece. Available in only a few coarser sizes of plain-end blades.

- **Spiral.** These twisted scroll saw blades leave a wide kerf. But, because they cut in all directions you don’t have to rotate the workpiece for curved cuts. And, they work well for bevel cuts. Plain-end only.

coarsest. Various suppliers assign different model numbers to pin-type blades, but the same width, thickness, and teeth-per-inch guidelines apply to choosing the right pinned blade.

What blades do the pros use? To find out, I asked Gene Douglas, co-owner of Marlow Woodcuts in Americus, Kansas. His family operation cranks out more than 5,000 intricately scroll-sawn pieces every year, and goes through more than 2,000 blades in the process. Gene wouldn’t reveal his source, as he considers that a trade secret, but he did tell me what type of blade he favors. For ¾” walnut plywood with a poplar center, the Marlow scroll sawsers clamp no. 2/0 scrollsaw blades into their machines, and use no. 5 standard blades when sawing ¾” solid walnut.

A few more blade-buying guidelines

- For metal cutting, buy a jewelers blade. Available in up to 20 universal sizes, these plain-end, hardened blades have the same tooth pattern as scrollsaw blades.

- If you plan to buy a scrollsaw, keep in mind that you’ll find the widest array of blades in the 5” length. Although the majority of saws accept this size, some “hobby” machines take 2¼” blades.

- Don’t forget that the quality of your scrollsaw may have a bearing on your blade purchase. As Ron King told me, "If I’m using a less-expensive Sears or other Taiwanese-made saw, to avoid breakage I have to buy a thicker and wider blade than if I’m working with a Delta, RBI, Hegner, or other high-quality saw."

- And yes, it’s nearly impossible to tell one size scroll saw blade from another. So, you need a storage system such as the one we designed (see page 80).

For more information and catalogs

**Advanced Machinery Imports**
P.O. Box 312
New Castle, DE 19720
Call 302/322-2226

**Olson Saw Co.**
Route 6
Bethel, CT 06801
Call 203/792-8622

Written by Bill Krier  Illustrations by Jim Stevenson  Photograph by Bob Calmer
Swing into spring with this
PETAL-POWERED

Hang around a blooming garden long enough and you're sure to be mesmerized by the beating of a hummingbird's wings and the darting of its slender body from flower to flower. Now, you can savor that image year-round with our brightly colored wall plaque crafted on the scroll saw. And, for a depth effect, we've rounded the front edges of the pieces.

Prepare the stock for scroll sawing
1. Cut two pieces of flat ¼"-thick pine to 9" square. (To achieve the grain on the flower and bird running in one direction and the grain of the background pieces going in the opposite direction, you'll start with two boards and end up with enough pieces for two projects.)

2. Completely cover one face of one of the pieces with double-faced tape (also called carpet tape). With the edges and ends flush, stick the two pieces together, with the grain of one of the pieces perpendicular to that of the other where shown on the drawing above.

3. To enlarge the gridded pattern shown on the opposite page, draw a 1" grid measuring 9 × 9" on a piece of paper. Using the grid pattern as a guide, lay out the shape of the flowers and hummingbird onto the gridded paper. To do this, mark the points where the pattern outline crosses each grid line. Draw lines to connect the points. You'll need three patterns for this project, so either trace two more patterns from the first, or photocopy the first pattern twice.

4. Now, using double-faced tape, adhere one of the full-sized patterns to the face of the top piece.

Scrollsaw and sand the parts to shape
1. To minimize splintering and to prevent small pieces from becoming lodged between the blade and the metal table, add a zero-clearance top to your scrollsaw. (To do this, we cut a piece of ¼" plywood to 13 × 13". Then, we drilled a ½" blade hole through the middle of the plywood and adhered the plywood to the metal scrollsaw top with double-faceted tape.)

2. Scrollsaw the flower and hummingbird patterns to shape. After you cut each piece, separate the two pine sections, remove the double-faced tape, and mark an X on the back side of each. This will come in handy later when sanding the round-overs in the next step.

3. Sand a slight round-over along the front edges of each piece—remember, the back side has an X on it. The round-overs add a professional three-dimensional appearance. (To sand the round-overs, we formed a drill clamp out of a scrap 2 × 4 and a 4" carriage bolt, and held it in a woodworker's vise as shown below.) You also can hand-sand the round-overs with a palm sander or mount a flexible-sanding disc or drum sander to your drill press.

Sand slight round-overs on the front face of each pattern piece.
scrollsaw sculpture
WALL HANGING

Beauty blooms when you paint and adhere the pieces
1 Cut the back (B) to size from ½" plywood. Apply a thin, even coat of woodworker's glue to the face side of the plywood; then, stick a full-sized pattern to the back (B).
2 Remove the double-faced tape and/or the pattern from the front of the sanded pieces. In a well-ventilated area, dampen a cloth with lacquer thinner, and clean each piece (the double-faced tape tends to leave a sticky residue).
3 Group all the green pieces together and paint them. (We used fast-dry enamel spray paint. To allow the grain to show through slightly, we sprayed on the first coat of paint and immediately wiped off most of it with a clean cloth. Later, we applied a light second coat without wiping it off.) Repeat for the red, brown, and white pieces.

4 Use woodworker's glue to adhere the pieces, one at a time, to the paper pattern glued to the ½" plywood as shown below.

Apply glue to the pattern pieces, and adhere them to the backing board.

5 After gluing all the pieces in place, check for 90° corners. Trim as necessary.

Add the frame, and apply the finish
1 Cut two pieces of ½" pine to 1½" wide by 22" long for the frame pieces (C). Rout ¼" round-overs along one edge of each.
2 Miter-cut the four frame pieces to length. Glue and clamp the frame pieces to the center portion.
3 To allow for hanging the project, drill a ¼" hole ½" deep at an upward angle on the back side of the frame where shown in the Hole Detail accompanying the Exploded-View Drawing.
4 To avoid runs, spray on several light coats of a clear finish (we used Deft, an aerosol lacquer).

FREE PATTERN OFFER
Three full-sized hummingbird-and-flower patterns.
Just send us a self-addressed, stamped, No. 10 business envelope to:
Humdinger of a Pattern
WOOD Magazine
P.O. Box 314
Des Moines, IA 50336-1454
Foreign readers, please include an international reply coupon.

GRID PATTERN
Each square = 1"
Customized TABLESAW

Note: We sized our base to fit a Sears 10" direct-drive tablesaw. The sides of the base are flush with the sides of the saw. You may have to alter the base size to fit your particular saw.

Construction begins with the cabinet carcass
1 Rip and crosscut the two side panels (A), dividers (B), and back (C) to the sizes listed in the Bill of Materials from 3/4" particleboard.
2 Cut or rout 3/4" dadoes 1/4" deep in each side panel for the dividers to fit into. See the Exploded-View Drawing on page 62 for location. Cut a 3/4" rabbet 1/4" deep along the back edge of each side panel.
3 Measure the outside diameter of your vacuum hose (we measured ours at 21/4" with an outside calipers). Using a compass, center and mark the hole location to the back (C) where shown on the Exploded-View Drawing. Drill a blade-start hole, and cut the hole to size with a circle cutter or jigsaw.
4 Glue and clamp the dividers and back piece between the side panels, checking for square. After the glue dries, remove the clamps, and

Here's a great-looking addition for your shop, with lots of advantages over run-of-the-mill tablesaw stands. The thing I think you'll appreciate most about this project is the dust-gathering performance made possible by the enclosed top compartment. But that's not the only goodie I've designed into the base. You'll also find nifty places to store your pushstick, miter gauge, rip fence, saws blades, and a wrench to change those blades. The whole project, including the hardware, costs less than $65.

For safe cutting later, make a pushstick
1 Cut a piece of heavy paper to 4" x 13", and draw a 1" grid on it. Using the grid pattern at right for reference, lay out the pushstick shape on the gridded paper. To do this, mark the points where the pattern outline crosses each grid line. Next, draw lines to connect the points. Mark the centerpoints for the two 3/4" holes.
2 Cut the paper pattern to shape, and use it as a template to transfer
sand the joints. Rout a ¼" round-over along the edges of the base where shown on the Exploded-View Drawing.

Attach the trim, and mount the cleats and access panel
1 Cut the baseboard parts (D, E) to size plus 2" in length. (We chose birch; you also could use good-quality 2×6 material.) Bevel-rip a 1¼" chamfer along the top outside edge and a ¾" chamfer along the bottom outside edge of each piece. Miter-cut the pieces to length, and glue and clamp them flush with the bottom of the cabinet.
2 Cut the mounting cleats (F) to size, drill mounting holes through the side panels, and screw the cleats flush with the top edge of the cabinet sides where shown on the Exploded-View Drawing.
3 Cut the access panel (G) to size. Mark the location, and bore a 1" finger hole in the access panel.

Add the drawer and blade rack
1 From ¾" particleboard, cut the drawer face (H), front (I), sides (J), and back (K) to the sizes listed in the Bill of Materials. Cut the drawer bottom (L) to size.
2 Cut or rout a ¼" groove ½" deep ⅛" from the bottom edge into the drawer sides (J) and front (I) where shown on the Drawer Drawing above. Now, cut a ¾" dado ¾" deep 4" from the back edge in each drawer side. Next, cut or rout a ¾" rabbet ¼" deep along the front edge of each side. Dry-clamp the pieces to check the fit.
3 Glue and clamp together the drawer (I, J, K, L), checking for square. Using the Drawer Drawing for reference, mark the centerpoints, and drill four shank holes through the front (I). Countersink the holes on the back side of the drawer front. You'll use these holes later for attaching the drawer face.
4 Cut the blade rack parts (M, N) to size and cut the dados where shown in the drawing above. Assemble the rack.

Let's add the fence and miter-gauge holders
1 Cut the fence holder parts (O, P) to size. Glue and clamp O to P, with the bottom edges and ends flush. Glue and screw the fence holder to the right-hand side panel (A) where shown on the Exploded-View Drawing.
2 Cut a piece of ¾"-thick birch to 2½" wide by 12½" long for the miter-gauge holder (Q). Cut or rout a 1" groove ½" deep along the center of part Q. See the Miter Gauge Holder Drawing for location.
3 Drill six ⅝" shank holes through the holder (Q) where shown on the Miter-Gauge Holder Drawing. Set it aside; you'll attach it later.

Continued
Mount the access panel, magnetic catches, and pull
1. Cut one piece of 3/4" continuous hinge to 13½" long. Screw the hinge to the bottom edge of the access panel (G) and to the top of the upper divider (B) so the access panel closes flush with the front of the divider and the side panels.
2. Fasten the magnetic catches to the side panel (A) ¾" from the front edge. Now, close the access door and mark the mating location on the back side of the door for the strike plates. Fasten the strike plates to the back side of the access door.
3. Locate and drill the wire-pull holes through the drawer face. Attach the wire pull.

Mount the drawer slides and drawer face
1. Position the front edge of one of the drawer slides flush with the front edge of one of the drawer slides (J). Position the back bottom edge of the roller flush with the bottom edge of the drawer slide. Fasten the roller end of the slide to the drawer slide.
2. As shown in the photo below, use a combination square to keep the slide parallel with the bottom edge of the drawer, and fasten the slide to the drawer side. Repeat the procedure to fasten the other slide.

Apply the finish
1. Position your tablesaw (minus the metal base) over your new base. Trace the location of the mounting holes from the tablesaw to the cleats. With the saw still resting on the base, position the miter-gauge holder, and glue and screw it to the left-hand side panel (A).
2. Remove the saw from the base and drill the mounting holes.
3. Mask the continuous hinge, and remove the rest of the hardware from the cabinet. Finish-sand the base and drawer. Fill all exposed edges with putty and sand smooth.
4. Apply one coat of sanding sealer to the base. Let dry, and hand-sand smooth. Repeat this process twice.
5. Spray several coats (we applied three) of an enamel paint to the base. (We took a piece of metal from our tablesaw to a paint store, and had them mix paint to match.) Fasten the tablesaw to the base.

Position the drawer slide parallel to the bottom of the drawer.

3. Fasten the mating slide components to the sides (A), with the bottom edge of the slide flush with the top surface of the divider and 3/4" back from the cabinet front.
4. Slide the drawer into the cabinet and adjust the slides if necessary. Place several large pieces of double-faced tape on the front face of the drawer front (1). Using ¼" spacers, center the drawer face (H) over the drawer in the opening as shown in the photo below. Now, press firmly against the drawer face to adhere it to the drawer front.

5. Remove the drawer assembly from the cabinet. Fasten the drawer face to the drawer front with four ⅜" x 1¼" drywall screws using the holes previously drilled in the drawer front.

Center the drawer face in the opening, and adhere it to the drawer.

Vol. 155 No. 2166

WOOD MAGAZINE   APRIL 1990

Produced by Marilen Kemmet
Project Design: James R. Downing
Photographs: Jim Kascoutes
Hopkins Associates
Illustrations: Kim Downing; Mike Henry
THICKNESS
PLENTY OF POWER IN A

A big part of our job here at WOOD magazine is listening to our readers and responding to what you say you need. So when we received a large number of letters asking our opinion about portable thickness planers, we decided to marshal our forces and get busy on this article. Our thanks to all of you readers who tipped us off about your interest in this topic. Among the many readers who wrote to us: Jim Mitchell, whose letter appears below.

Dear WOOD:

Since your excellent review on thicknessing machines in the October 1986 issue, a new era has arrived for the home craftsman. I am speaking about all of the 10"-12" portable thickness planers that have recently flooded the market.

A short time ago, I decided to purchase a planer for my small home workshop. Thinking of the 10" Ryobi planer, I paid a visit to my local machine company and talked to salesmen and customers. I was astonished to learn that no less than eight companies now market planers in this category. With so many brands to choose from and prices spread over such a wide range, the woodworker needs to know more about these machines than just their wood capacity and price. Can you help?

James L. Mitchell
San Antonio, Texas

Thanks to their light weight and relatively low price, portable planers are ideal for on-the-go woodworkers, as well as for those who don’t want to spend a lot of money on a planer. Does that sound like you?
PLANE UNDER $500
PINT-SIZED PACKAGE

Until about five years ago, a thickness planer probably was beyond the budget of readers such as Jim Mitchell (see his letter at left) and maybe you, too. After all, the lowest-priced models ran close to $1,000. Then, along came Ryobi’s AP-10 portable thicknesser, which sold for about $350 and planed boards up to 10” wide. Suddenly, at-home thickness planing became affordable.

Today, as the photo on page 66 attests, Ryobi faces several competitors offering machines that plane 12”-wide boards. The newest kid on the block, Makita’s model 2012, sells for approximately $499. For $150 less, you can buy a Sears model 23381 that handles a 12”-wide board in two passes. And, no fewer than six importers sell Taiwanese-made clones for prices ranging from $330 to $370.

The nuts and bolts of a thickness planer
Before we get into the thick and thin of what makes these machines different from one another, it helps to know what makes them different from their more-expensive big brothers. As you can see by looking at the cutaway photo at left of the Ryobi AP-10, a universal motor takes the place of the heavier-duty induction motors found on most larger machines. Although induction motors generally provide greater power and reliability at lower noise levels, all of the machines we tested had enough power to plane even the hardest of woods. And, provided you change the motor brushes when necessary, the universal motors will perform well for you for many years.

Unlike larger thicknessers, none of the portable machines in our test performed well when we asked them to remove more than 3/8” of stock in one pass. (Larger machines gobble up to 3/4” in one pass.) Although it takes a little longer to get the job done with a portable unit, that shouldn’t matter to most home woodworkers. Besides, shallow cuts make for smoother surfaces.

To adjust the depth of cut, you turn the elevation crank to raise or lower the head assembly. Makita’s 2012—the one exception—has a stationary head and elevating table. However, we didn’t find any performance differences in these two styles. Except for Sears’ open-sided model, all of the units have two formed-steel sides to support the head assembly. These walls provided adequate support for the two-sided machines, but we detected excessive head flex in the single-side-support engineering of the Sears unit. This inherent flex made it difficult to adjust the cutterhead parallel to the table. The result: uneven stock removal.

Continued
THICKNESS PLANERS

Feed tables: We prefer slip plates
The feed table on a thickness planer must provide a smooth, flat surface for the stock to ride over. We pulled out the report cards and assigned each machine a grade.
A-minus: Makita 2012 and Ryobi AP-10. Both of these machines have stainless-steel slip plates that make for flat, smooth, nonmarring feed tables. We assigned a “minus” to this grade only because you need to occasionally check for sawdust buildup under the slip plate.
B: Sears 23381. This combination thicknesser/molder has a particleboard surface that provides a flat, but nondurable surface. Why particleboard? During some molding setups, the machine’s knives cut into the feed table.
C: Taiwanese-made units. These thicknessers have two steel rollers jutting above the cast-aluminum feed table. We found it a pain to adjust the rollers because they must align exactly while barely clearing the table.

We tested these portable thicknessers: front row from left: Makita 2012 (capable of a 12"-wide cut), Ryobi AP-10 (10" capacity), and Sears 23381 (12" capacity in two passes); and four nearly identical Taiwanese-made 12" thickness planers on the benchtop from left: Total Shop, Transpower, Jet (at top), and Penn State.

Blade changes: How we grade the machines
Like you, we would rather use our woodworking machines than spend a lot of time adjusting and maintaining them. So, when the time comes for routine chores such as sharpening and adjusting planer knives, we opt for the easiest method possible. We put all the machines through a knife-changing test, and once again came up with performance grades:
A-plus: Makita 2012. We can’t imagine any way for Makita to improve the already super-simple blade-changing system on its model 2012. First of all, this planer’s throwaway knives (list price: $34 per set) mean you never have to run out for resharpening, which costs about $8–$10 per knife set. As shown below, each knife has two edges, so when one dulls, you just turn around the blade and reinsert it. And, thanks to a milled slot down the length of the blade, the razor-sharp edges self-align whenever you insert the blade into the cutterhead. To help you accomplish this, Makita provides magnets (see photo below) that keep together the blade and its holder during insertion.
A: Ryobi AP-10. If you would rather save a little money by having your blades sharpened, the Ryobi machine makes blade changes relatively simple. The AP-10 comes equipped with the plastic jig shown below. It automatically

Makita’s throwaway blade, right, has two edges versus the one resharpenable edge on Ryobi’s blade.

Two magnets safely hold together Makita’s blade and holder for attachment to the cutterhead.

A plastic jig and Phillips screwdriver make easy work of aligning Ryobi’s blade and holder.
A last-minute addition from Foley-Belsaw

After we tested the machines in this story, Foley-Belsaw introduced a new planer, much like the unit they make for Sears that’s listed in the chart below. The Foley-Belsaw planer, shown at right, differs from the Sears machine in that it has a carrying handle and an extra set of knives, but no stand. Selling price for the model 455: $399.95.

<table>
<thead>
<tr>
<th>Manufacturer/Importer</th>
<th>Model</th>
<th>Max. Throat (in.)</th>
<th>Max. Depth (in.)</th>
<th>Amps</th>
<th>Speeds (ft./min)</th>
<th>Fed Rate (ft./min)</th>
<th>Capacity (in.)</th>
<th>Accessories</th>
<th>Dust Hood</th>
<th>Weight (lb)</th>
<th>Country of Origin</th>
<th>Selling Price</th>
</tr>
</thead>
<tbody>
<tr>
<td>Makita</td>
<td>2012</td>
<td>12</td>
<td>6</td>
<td>12</td>
<td>110</td>
<td>20</td>
<td>51</td>
<td>N</td>
<td>Dust hood, stand</td>
<td>Aluminum</td>
<td>Japan</td>
<td>499</td>
</tr>
<tr>
<td>Ryobi</td>
<td>AP-10</td>
<td>10</td>
<td>5</td>
<td>13</td>
<td>110</td>
<td>25</td>
<td>51</td>
<td>N</td>
<td>Dust hood, stand</td>
<td>Steel</td>
<td>Japan</td>
<td>350</td>
</tr>
<tr>
<td>Sears</td>
<td>23381</td>
<td>12</td>
<td>4</td>
<td>12.6</td>
<td>110</td>
<td>20</td>
<td>58</td>
<td>Y Stand</td>
<td>Molding knives</td>
<td>Steel</td>
<td>USA</td>
<td>359</td>
</tr>
<tr>
<td>Various*</td>
<td>—</td>
<td>12</td>
<td>6</td>
<td>18</td>
<td>110</td>
<td>25</td>
<td>51</td>
<td>N</td>
<td>Dust hood, stand</td>
<td>Steel</td>
<td>Taiwan</td>
<td>350</td>
</tr>
</tbody>
</table>

*Similar machines imported by AMT, Jet, Lobo, Penn State, Total Shop, Transpower, and Wike Machinery

**Open throat allows 8" knives to plane 12" board in two cuts

More buying points

- **Quality of cut.** Here, the planers produced mixed results. First, the good news. All of the machines planed a smooth surface right out of the box. Now, the bad news: All of the machines also cut 2"-long indentations (snipe) at both ends of the boards. In all fairness, we’ve seen larger, $1,000-plus thickness planers produce some snipe, and 4" of waste per board isn’t unheard of with even those thicknessers.

- **Extension tables.** Again, the Makita and Ryobi models have the edge on their Taiwanese competitors. The Ryobi has fold-down roller extensions, and the Makita uses flat, chrome-plated table extensions. Both provide adequate support and adjust easily. The Taiwanese-made machines have a flimsy table made of black steel that will rust in time—and possibly mar workpieces. Because of Sears’ particle-board feed table, you simply attach a longer piece of particleboard when you need a longer table.

Written by Bill Krier
Technical consultant: George Granseth
Photographs: Hopkins Associates
A SIMPLE STRINGED INSTRUMENT FOR YOUR MUSICAL PLEASURE
BOWED PSALTERY

OK, all you would-be musicians out there. Here's your chance not only to build your very own instrument, but also to learn how to play it. The bowed psaltery, developed during the Renaissance, has a high-pitched, soothing, and distinctive sound that's most pleasing to the ear. See the Buying Guide for our source of hardware and a music lesson cassette and song booklet. You'll be playing a tune or two in no time at all.

Cut the pieces and build the frame
1. From ¾" walnut, cut the side rails (A) to the size listed in the Bill of Materials plus 1" in length.
2. Using the drawing below for reference, mark the cutlines on the top surface of each side rail. Miter-cut the ends where marked. (We cut the 10° miter on a bandsaw fitted with a miter gauge, and then cut the long taper on a bandsaw fitted with a 3/8"-wide blade.)
3. Cut the pin block (B) to size. (If you don't have 1 1/2"-thick maple, laminate two pieces of 3/4"-thick stock face to face.)
4. Transfer the end clamp pattern at right to a piece of 1 1/2"-thick stock (a section of a 2 x 4 will work). Bandsaw the end clamp to shape.
5. Hold together the pieces (A, B) to check the fit. Sand or trim the ends of the side rails if necessary.

Bill of Materials

<table>
<thead>
<tr>
<th>Part</th>
<th>Finished Size*</th>
<th>Material Qty.</th>
</tr>
</thead>
<tbody>
<tr>
<td>A* side rails</td>
<td>3/4&quot; x 1 1/2&quot; x 20 1/4&quot;</td>
<td>W 2</td>
</tr>
<tr>
<td>B pin block</td>
<td>1 1/2&quot; x 1 1/2&quot; x 7 1/4&quot;</td>
<td>M 1</td>
</tr>
<tr>
<td>C* sound board</td>
<td>1/8&quot; x 7/16&quot; x 21 1/2&quot;</td>
<td>SSP 1</td>
</tr>
<tr>
<td>D* back</td>
<td>1/8&quot; x 7/16&quot; x 21 1/2&quot;</td>
<td>BBP 1</td>
</tr>
<tr>
<td>E* bridge</td>
<td>1/8&quot; x 1/2&quot; x 6 3/4&quot;</td>
<td>W 1</td>
</tr>
<tr>
<td>F* bow blank</td>
<td>1/8&quot; x 3&quot; x 15&quot;</td>
<td>W 1</td>
</tr>
</tbody>
</table>

*Cut parts marked with an * to the size listed. Then, trim them to size according to the how-to instructions.

Material Key: W-walnut, M-maple, SSP-Sitka spruce plywood, BBP-Baltic birch plywood.

Supplies: epoxy, 9/16" dowel stock, finish.
THE BOWED PSALTERY

for tight-fitting joints. Trim ⅛" off the tapered end of the side rails where shown on the Exploded-View Drawing.

6 Position the side rails, pin block, and end clamp on a piece of waxed paper as shown in the photo at right. Mix epoxy (we used quick-set). Spread an even coat of epoxy on the mating surfaces, and clamp together the frame as shown in the photo, checking that the top and bottom surfaces of the pieces are flush. Also check that the ends of the side rails are flush. (The end clamp helps pull together the siderrail miters ends tightly and provides a flat clamping surface.)

7 Using the Exploded-View Drawing for reference, mark the centerpoints and drill ⅜" dowel holes through the pin block and ⅝" into the side rails where indicated. (Be careful not to drill too deep and drill through the side of the rail.)

8 From ⅝" birch dowel stock, cut two pieces 2¼" long. Glue or epoxy the dowels in the holes just drilled. After the adhesive dries, trim off the excess dowel, and sand the frame smooth.

Now, add the soundboard and back piece

1 Position the psaltery frame on a piece of ⅝"×8×22" Sitka spruce plywood (see the Buying Guide at the end of the article for our source). Trace the frame's outline onto the plywood for the soundboard (C). Repeat the process for the back (D), but on a piece of ⅝"×8×22" Baltic birch plywood.

2 Using the Top View Drawing for reference, mark the centerpoint for the ⅝" soundboard hole. Bandsaw the soundboard and back to shape, cutting slightly outside the marked outline. Bore the soundboard hole where marked (we used a ⅝" Forstner bit and backed the plywood with scrap stock to prevent splintering).

3 Glue and clamp the soundboard (C) and back piece (D) to the frame. (We used woodworker's glue and long clamp blocks to protect the plywood and to hold the entire length of the plywood snugly against the frame.)

4 Sand the edges of the plywood flush with the edges of the frame. Hand-sand a slight round-over on all edges of the psaltery body.

Next, locate and drill the pin holes

1 Referring to the Top View Drawing, mark the four reference lines (used to locate the pin holes) on the top of the psaltery body.

2 Carefully measure and mark the pin-hole centerpoints on the four reference lines. (It is important to mark and drill the holes exactly where marked for proper spacing of the music wire.)

3 Build the drilling jig as illustrated in the drawing below left.

4 Drill ⅜" holes 1½" deep where marked on the reference lines along the two sides (not the end) of the psaltery body. (We used a brad-point bit to drill the holes because a twist bit tends to wander off the marked centerpoint.)

5 As shown in the photo above right, position the psaltery body on the jig, and center the bit over one marked reference line. Now, clamp the jig to the drill-press table and check that the bit still centers over the centerpoint. Using the jig for support, drill ⅜" holes 1½" deep at the marked centerpoints. (See the Hole Detail at right for reference.) Reposition the jig and drill the second set of angled holes along the remaining marked reference line.

6 Switch to a ⅛" bit and drill a pair of ⅛"-deep holes for the C-string reference marks where shown. Plug each hole with the ⅛"-diameter plastic rod included in the psaltery hardware kit.

Build a bridge for the wires

1 Cut a piece of ⅛"-thick walnut to 1×12" long for the bridge (E).

2 Tilt your tablesaw blade 30° from vertical. Bevel-rip one edge of the piece to create the shape shown in the Bridge Detail accompanying the Exploded-View Drawing. Tilt the blade 10° from vertical and
Using the angled drill jig for support and positioning, drill the pin holes.

bevel-rip the top edge. (The angled top edge helps ensure that the strings make firm contact with the wood “at the leading edge” where the strings begin to vibrate. A flat-topped bridge tends to create unwanted buzzes when the strings vibrate during playing.)

3 Miter-cut the ends of the bridge at a 30° angle to a length of 6¾”.

4 Glue and clamp the bridge to the soundboard where shown on the Exploded-View Drawing.

As an option: add the sound hole cutout

1 Using a photocopy or carbon paper, transfer the full-sized pattern below to ⅜” walnut (we resawed thicker walnut to size).

2 Cut the pattern to shape on a scroll saw. Sand a round-over along the top outside edge of the cutout.

3 Center the cutout over the hole, and glue it in place.

FULL-SIZED SOUND HOLE CUTOUT

Continued
THE BOWED PSALTERY

Now, build the bow and apply the finish

1 Resaw or plane a piece of 3 x 15" walnut to 3/8" thick for the bow blank (F). Draw a 3 x 15" grid and transfer the bow pattern below to the grid. Using spray-on adhesive, transfer the grid to the walnut stock. (The psaltery hardware kit listed in the Buying Guide contains a full-sized bow pattern.)

2 As shown in the drawing below right, position your bandsaw fence so the blade is centered from side to side on the bow blank. Then, bandsaw a kerf 1¾" long into the handle end and a kerf 3¾" long into the opposite end.

3 Bandsaw the bow to shape, and remove the paper pattern. Sand slight round-overs on the bow.

4 Sand the psaltery body and bow smooth. Apply the finish (we brushed on one coat of lacquer sanding sealer and then sprayed on two coats of semi-gloss lacquer.)

Set the posts, and string the wire

Note: When stringing the psaltery, you'll use two types of pins—tuning and hitch. The tuning pins fit in the angled holes in the pin block and the hitch pins—those with a notch in the top—go in the holes above the side rails.

1 Clamp the psaltery to the top of your workbench as shown at right.

2 With a small rubber-tipped mallet or hammer, lightly pound the tuning pins into the angled holes until ¾" protrudes above the surface of the sound board. (We placed a piece of ¾"-thick stock along the pins to use as a depth guide.) Then, tap the hitch pins—

 Clamp the psaltery body to your workbench, and tighten the wires between the hitch and tuning pins.
those with notches—into the holes above the side rails.
3 Using the tuning wrench, twist the hitch pins so the notch faces the tuning pin where shown on the drawing titled Stringing the Psaltery on the opposite page. Twist the tuning pins so the holes point toward the bridge.
4 Measure the distance from the G hitch pin to the G tuning pin (see the String Diagram at left for reference). Cut a piece of music wire to this length plus 3".
5 Poke one end of the music wire through the hole in the hitch pin. Wrap the wire a half turn counterclockwise around the pin and go back through the hole where shown on the drawing titled Stringing the Psaltery.
6 Pull the music wire over the hitch pin so the wire rests in the notch. Pull the wire over the bridge and back to the tuning pin. Insert the wire through the hole in the tuning pin so that it protrudes through the other end of the hole. As shown in the photo on the opposite page, turn the pin clockwise with the tuning wrench to tighten the wire. The wire should wrap around the tuning pin below the hole. Clip off the excess wire.
7 Repeat the process to string the psaltery as shown on the String Diagram. With a hobby knife (we used an X-acto), make a fine cut on the walnut bridge under each wire to keep the wires spaced evenly on the bridge.

Add the bow hair to the bow
1 Tie a knot about ¼" from one end of the bow hair. Slip the bow hair through the small kerf, and comb the hair—a fine-toothed comb works well—so the hairs are straight and untangled. Pull the unknotted bow hair through the kerf in the other end of the bow and mark the location on the bow hair of the second knot. Tie a knot where marked, and string the knotted end onto the bow handle. If the bow hair isn’t taut, reposition the knot and try again. Put a drop of Super Glue on both knots to keep them from unraveling.
2 To initially prepare the bow hair for playing, chip off a bit of rosin from the cake enclosed with the hardware kit. Pulverize the rosin into a fine dust, and work the rosin dust into the entire length of the bow hair. After this has been done, you'll need to occasionally draw the bow across the rosin cake to restore it.
3 Finally, rosin up the bow, turn on the cassette listed in the Buying Guide and tune each string. (You could also tune the psaltery comparing the tones to a piano.) Then, use the other side of the cassette and the song booklet to learn how to play your new instrument.

Buying Guide
- Psaltery hardware kit. One piece of ¼ × 8 × 22" Baltic birch plywood for back and one piece of ⅜ × 8 × 22" Sitka spruce plywood for the soundboard, ¼"-diameter plastic insert 1" long, tuning wrench, 48 pins (24 notched hitch pins and 24 tuning pins), 50 feet of music wire, rosin for bow, one hank of bow hair, full-sized bow pattern. $43 ppd. St. Croix Kits, 423 S. Main St., Stillwater, MN 55082.
- Music lesson kit. Tuning and song cassette and booklet. If ordering the hardware kit above, add $9.95 for the lesson kit. If ordering this alone, the lesson kit sells for $12.95 ppd. To order, use the address listed above.

Produced by Marlen Kemmet
Project Design: David Marks
Photographs: Hopkins Associates; Bob Calmer
Illustrations: Kim Downing; Mike Henry
CARVE A BLUEGILL
RICK BEYER CAPTURES WISCONSIN'S FAMILY FISHING FAVORITE

Racine, Wisconsin, carver Rick Beyer has fished since he was a kid. Today, though, he hardly finds time because he's busy carving award-winning fish.

Cherry and a natural finish trademark Rick's work. But it's not just cherry's striking color that wins him top honors. "It's important to portray as much action as possible," he says.

Getting started in cherry
Rick carves cherry with power-carving equipment, such as a Dremel Moto-Tool. With only hand-carving tools, opt for softer stock, such as basswood.

For a fish à la Rick Beyer, you'll need a solid block of cherry measuring 6" x 9" and a full 2½" thick. "Pick wood with straight grain running the length and no large, dark sap pockets," Rick advises. (Or start from a blank, see below.)

Trace the side view on the wood, then bandsaw the fish to shape. Next, stand the block up and draw on the top view. Saw along these lines.

To remove the extra wood along the back and bottom fins, around the head, and along the lower stomach, tilt your bandsaw table about 45° and follow the outline of the sawed-out blank. Now, carve the fins until you reach a 3⁄16" thickness. Then, after referring to the cross section shown in the pattern, shape the body.

Next, sketch in an elongated, S-shaped curve on the tail fin. Place the body in a padded vise and remove the wood on the tail down to 3⁄16" of thickness for final detailing.

Now you can start on the details—gills, eyes, and lips. Then, sand the fish's body and fins, tapering an edge on all body fins.

Featuring the fins
Pencil in and carve the ridges on the dorsal, lower, and tail fins. Cut the ventral and pectoral fins from scrap cherry with the grain running in the same direction as the fin ridges. Leave fins about 3⁄8" thick so you can add movement.

Next, hold the ventral and pectoral fins to the body and draw their base outline where they attach. Carve a slot for each fin at the angle you wish it to protrude. Trim the fins to fit. Finish-sand the body, then glue in the fins.

Find the location of the double nostrils (about 3⁄16" away and down from each eye). Drill them with a ¼" bit.

For a finish, Rick uses Formby's gloss tung oil. He sands between coats for smoothness.

One in a collection of regional patterns from the nation's top carvers

To order a cherry blank and fins, send $14 (U.S.) ppd. to: Fish, Beyer Galleries, 1115 N. Main, Racine, WI 53402.

For a free, full-sized pattern, send a self-addressed, stamped (foreign readers include an int. reply coupon), business-sized envelope to: BLUE-RIBBON BLUEGILL, WOOD Magazine, Box 11454, Des Moines, IA 50336-1454.

Design: Rick Beyer
Drawings: Jim Stevenson
Photograph: Bob Calmer
New Feet-Inch Calculator Solves Woodworking and Home Building Problems—In Seconds!

Amazing Pocket Handyman® Lets You Work Like a Pro for Only $39.95!

Now you can solve all your woodworking and do-it-yourself problems right in feet, inches and fractions—with the new Pocket Handyman feet-inch calculator.

This amazing new calculator will save you hours upon hours of time on any project dealing with dimensions.

And best of all, it puts an end to costly errors because of inaccurate conversions using charts, tables or regular calculators.

Adds, Subtracts, Multiplies and Divides in Feet, Inches and ANY Fraction

You never need to convert to 10ths or 100ths because the Pocket Handyman works with all dimensions just like you do.

Plus, it lets you work with any fraction—\(\frac{1}{2}\), \(\frac{1}{4}\), \(\frac{1}{8}\), \(\frac{1}{16}\), \(\frac{1}{32}\), even down to \(\frac{1}{128}\), or no fraction at all.

You enter a feet-inch-fraction number just as you'd say it—7 [Feet], 6 [Inches], 1 \(\frac{1}{2}\). What's more, you can mix all fractions \((\frac{1}{8} + \frac{11}{32} = \frac{3}{32})\) and all formats (Feet + Inches + Yards + Meters) in your problems.

In addition, you can easily figure square and cubic measurements instantly. Simply multiply your dimensions together and the Pocket Handyman does the rest.

Converts Between

ALL Dimension Formats

You can also convert any displayed measurement directly to or from any of the following formats:
Feet-Inch Fraction, Decimal Feet (10ths, 100ths), Inches, Yards and Meters.

It also converts square and cubic.

Plus, the Pocket Handyman actually displays the format of your answer right on the large LCD read-out—"Square Feet," "Cubic Yards," etc.

Comes Complete

The Pocket Handyman also works as a standard math calculator with Percent, Memory (which also handles dimensions) and battery-saving Auto Shut-Off.

And the Pocket Handyman is com-

Use the new Pocket Handyman to solve all these problems:

- Dimension Checks
- Furniture Making
- Roofing Projects
- Cement & Concrete (Volume)
- Cabinets & Woodworking
- Estimating All Materials
- Spacing Problems
- Carpeting (Sq. Yards)
- Stairs & Decks
- Wallpaper/Paint (Area)
- Brickwork
- Foundations
- Tile Flooring
- Skylight Installation
- Windows & Other Glass
- And much, much more!

To order your Pocket Handyman at the discounted price of just $39.95, or 2 for $74.95, complete and return the coupon below to: Calculated Industries, 22720 Savi Ranch Pkwy., Yorba Linda, CA 92686. Or Call Toll-Free 24 hours every day:

1-800-854-8075

And if for any reason you're not completely satisfied with your new Pocket Handyman, simply return it within 30 days for a full refund. So you can't go wrong! Start saving time— and put an end to costly errors. Order your Pocket Handyman feet-inch calculator now!

ONLY $39.95

100% 30-Day Money-Back Guarantee

If for any reason you are not 100% delighted, return your calculator within 30 days for a full, no-questions-asked refund. Your satisfaction is our #1 concern.

New Pocket Handyman feet-inch calculator solves home improvement problems with the touch of a button.

 pact (2.25 x 3.5 x 1.5) and lightweight (3.5 oz.), so it fits easily in your pocket.

What's more, it comes with easy-to-follow User's Guide, full 1-Year Warranty, replaceable 2-Year batteries and vinyl carrying case.

FREE Gift - Order Now!

Plus, if you order your Pocket Handyman within the next 10 days, we'll include a custom-fitted leather case—a $10.00 value—as your FREE Gift!

Clip & Mail Today!

Calculated Industries, Inc.
22720 Savi Ranch Parkway
Yorba Linda, CA 92686

Toll-Free 24 Hrs. 7 Days
1-800-854-8075

Cut & Paste 24 Hrs. 7 Days
(714) 921-1800 - FAX: (714) 921-2799

Rush the following order
With my FREE Leather Case:

Pocket Handyman $39.95
2 Pkt. Handyman $74.95
Black Leather Case $10.00 FREE with calculator

Gold Initials $1.50 each initial

Add $1.50 shipping, for each additional unit ordered.

In CA add 6.25% tax

TOTAL

Name

Address

City/State/Zip

Check 
VISA 
MasterCard 
Am/Exp

Account #

Exp Date

Sign Here

© Calculated Industries, 1990. All rights reserved.

Leather Cases with Initials are, of course, not returnable.

BHWM-390
TIPS ON KEEPING YOUR
AIR COMPRESSOR
ALIVE AND WELL

Even if you only rely on your air compressor to blow occasional sawdust, take care to keep it healthy.

Your air compressor’s full-life expectancy begins with the routine maintenance outlined in the owner’s manual. Representatives of the four major compressor manufacturers, though, say there’s more you should do.

Supply full power
Most small (1/2–5 hp.) compressors operate electrically. But, to be efficient and run smoothly, your air compressor needs the full dose. Cautions Dave Pooley of DeVilbiss Co., which builds Sears compressors, “Using a long, lightweight extension cord reduces the voltage to the compressor and can cause the motor’s coils to overheat and burn up. For an extension to the job site, add air hose, not electrical line.” Gary Wenderoth of Campbell-Hausfeld, agrees. “Insufficient electrical current is the No. 1 killer.”

Most compressor manufacturers strongly advise plugging their products directly into an electrical outlet to avoid the problem of voltage drop. But even then, they say, some circumstances can conspire to underpower your compressor motor. First, other motor-driven appliances, such as a freezer or a washer operating simultaneously on the same electrical circuit, will draw down available current and cause the compressor motor to overheat. “Less obvious is the possibility of inadequate power flowing into your home and shop,” Pooley continues. “If your compressor isn’t running with its usual zip—especially during those hot, muggy days of the air-conditioning season—check the quantity of power on the line. It’s a lot cheaper to spend $20 for a voltmeter to detect an insufficient power supply than to let low voltage ruin your compressor.”

If you’re not receiving 115 or 120 volts (or 230 volts for larger compressors), have your power company check out the line. They

Continued on page 78
Quickest Way to Round Edges

Actually size is 7" x 2" x 1/4" Finally, a simple hand tool that quickly and precisely rounds over sharp edges. Choice of bodies in Rockmaple or Black-walnut. Radi-Plane Professional Edge Finishing Tool.
Now available from your finer woodworkers supply catalogs and retailers. Call 800-326-5415 for dealer nearest you. Dealer inquiries welcome.
L.A. Mathers Co. Stockton, Calif.

SCROLL SAW LETTERS EASILY...
...with Seyco’s Layout Guides!
Make Name Plates, Signs, Gifts and more.
Our unique Lettering Guides are available in many styles and sizes to suit your needs. Upper and lower case, Script and Block Styles...and numbers too.
SCROLL SAWS-ACCESSORIES BLADES-PATTERNS-BOOKS
Send $1.00 for brochure and prices to:
SEYCO
1414 Cranford Dr. • Box 472749 • Garland, TX 75047

CREATE A FAMILY TREASURE WITH KUEMPPEL CHIME
Red-i-Kut Kits
Each case is carefully handcrafted by grandfathers in 1/4" walnut cherry or oak. Precision West German movements, handcrafted pendulums, and individually handpainted moonwheels.

Write or Call for Catalog $2
1-800-328-6445
Kuempel Chime Dept. 023
21195 Minnesota Blvd.
Excelsior, MN 55331
Serving clockmakers for 65 years.

WOODCARVING IS FUN & PROFITABLE!
Want to carve decoys, statues or gun stocks?
It’s easy when you use the Dupli-Carver Series wood carving machines. A patented five-axis carving action allows these machines to complete difficult undercuts and contours as no other machine can. Complete machines are available starting as low as $359.00.
SEND $1.00 for our full line brochure and price list and start planning your full or part-time business.

Van Dyke’s
Presents a Catalog with supplies for upholstery, antique restoration, wood working, carving, brass hardware, carvings and many related trades!
36 Years in Creative Arts & Trades Many Hard-To-Find Items! SEND $1.00 for CATALOG TO: Van Dyke's Restorers Dept. D55 • Woonsocket, SD 57385
RIPSTRATE® SAVES FINGERS
AND MAKES STRAIGHTER CUTS

Keeps both hands away from the blade
No kickbacks
SELF ADJUSTING
Complete - no attachments to buy
Rigid cast iron construction

Used by thousands of amateurs, professionals, schools, corporations, government agencies, and military installations.

One year guarantee, 30 day money back trial.
Only $69 delivered Check, M.O., Visa or M/C. Free brochure.

WRITE OR CALL OUR TOLL FREE NUMBER: 1-800-421-0256
FISHER HILL PRODUCTS INC 4 FISHER HILL FITZWILLIAM NH 03447

COMPRESSORS
Continued from page 76

may have to replace the transformer supplying your house.

Provide enough air
A filter on the air intake keeps dust, dirt, and overspray from being sucked into your compressor pump. Left unattended, that filter clogs enough to make your compressor work harder and hotter, causing undue wear.

"Ideally, compressors work best in a cool, clean, well-ventilated environment," notes Pete Dieber of Sanborn Manufacturing Co.

"Avoid dusty conditions, such as sandblasting, by adding extra hose to move the work farther away from the compressor. If the unit must run in a hot, dusty place, clean or replace the air filter more often."

Besides the air filter, Pooley recommends keeping the compressor pump clean. "Occasionally, blow the dust off. And, cover the motor with a plastic bag and wash down the compressor pump with a degreaser. That keeps the air-cooling fins clean and operating."

Add tender loving care
If you have an oil-lubricated compressor, check the oil level before each use and add oil when indicated. After 40 hours, change the compressor oil.

"And, to ease the motor's workload, don't forget to regularly inspect and tighten belts on belt-driven compressors," advises Ingersoll-Rand's Charlie Curry. "Each time you use your system, check the pressure-relief valve, too. Never block this valve or increase the pressure setting for more air. That risks overheating."

Finally, if you have a tank-type unit, drain the tank of air and condensation at the end of every day of use. If you don’t, moisture will infiltrate the air line with disastrous results, particularly when you spray oil-based paints. Water left in the tank also rusts the inside and weakens its walls.
BUILD THIS BLANKET CHEST
Order plans for this charming reproduction
This beauty will be admired by family and friends alike—especially when they see the great storage space that you’ve gained for your prized quilts and blankets.
The chest lid is hinged, and a pair of shallow drawers below add an authentic touch.
For complete building plans, including the know-how for duplicating the beautiful antiqued, painted finish, send $12 ppd. (Canadian residents please remit postal money order in US funds to): HAMMERMARK ASSOCIATES
Box 201–ASW2, Floral Park, NY 11002.
Catalog available for $1.00 (refundable).

“CARVE A CAROUSEL HORSE” SPECIAL CONTENTS OF CAROUSEL HORSE KIT INCLUDE:
1 New “CARVING CAROUSEL ANIMALS” Book
31-1/4 scale patterns
7 piec “WARREN” brand set of carving tools
1 instruction booklet (Not Shown)
1 Carousel Horse Basswood Cut-Out
1 Warron Tool Co., Inc. Complete Catalog of Woodcarving Tools and Supplies FREE with order OR send $1.00 for catalog only.
Order # WICK-93 only $41.05 (USA).
Foreign countries add $1.00 shipping.
Send check or money order to:
WARREN TOOL CO., INC. Rt. 1, Box 14-A
Rhinebeck, NY 12572 Tel. # (914) 876-7817
NY state res. add sales tax COD/UPS Avail.

WOOD TOY
Patterns
Parts
Wheels
Many New Patterns to Choose from.
Executive toys
SEND $1.00 FOR NEW CATALOG & RECEIVE COUPON FOR FREE WHEELS & AXLE PEGS.
toys and joys
Box 628W
Lynden, Wash. 98264

COUNTRY CRAFTS
FULL SIZE CRAFT PATTERNS
MASTERCRAFT PLANS WEST Dept. 39H
P.O. Box 625, Redmond, WA 98073

Garden WINDMILLS
FULL SIZE PATTERNS
Beautify your lawn with these picturesque old windmills. 4 ft. to 12 ft. high. Easy to make with full size patterns and step by step instructions. Only $8.00 prepaid for our WINDMILL PACKET with patterns for both.
MASTERCRAFT PLANS WEST Dept. 318J
P.O. Box 529, Redmond, WA 98073

Be Your Own Boss and Make...
$18.00 to $30.00 AN HOUR!
Your FREE Lifetime Security Fact Kit tells you how to make $18.00 to $30.00 an hour in your own Foley-Belsaw Full-Service Saw and Tool Sharpening Business. Your FREE Fact Kit explains how you can:
— be your own BOSS!
— work full time or part time, right at home.
— do work you enjoy and take pride in.
— operate a CASH business where 90¢ of every dollar you take in is clear CASH profit.

And it is so easy to learn. Foley-Belsaw gives you all the facts and instructions. No experience or special training is necessary. Foley-Belsaw tells you everything you need to know to be successful.
And there’s plenty of business available in your area. You will be able to sharpen all types of saws, garden and shop tools for home, farm and industry. You will be able to set your own hours and not have to worry about layoffs and strikes. And there are no franchise fees. Any age person can succeed.

But you’ve got to get the FACTS before you can get started. So WRITE NOW for your FREE Lifetime Security Fact Kit. It’s yours to keep with NO OBLIGATION.

---

FREE LIFETIME SECURITY FACT KIT

---

FREE Full color catalog gives you all the facts
Build this CLASSIC “Roll Top” OAK DESK
from pre-cut first quality kit

---

FREE...

---

...Win a HEGNER Variable Speed Scroll Saw
Today more than ever, HEGNER Scroll Saws are the most desired in America. Combining German engineering, reliable performance, long blade life, and sand-free workpiece finish, they offer unmatched value.
By popular demand, once again we are giving a free HEGNER Multivax Variable Speed Scroll Saw to a lucky woodworker somewhere in America. To enter the drawing, just complete the coupon or call right now - no purchase is necessary.

1-300-322-2226

---

Please send my free Craftsman's Corner color catalog featuring the Classic Roll Top Desk and many other top quality hardwood kits. I understand I have no obligation.

Print Name
Address
Apt. #
City
State
Zip

CRAFTSMAN'S CORNER
Dept. 678
4012 N.E. 14th St.
Box AP
Des Moines, IA 50302

---

---

---
QUICK-AND-EASY SCROLLSAW-BLADE ORGANIZER

Now that you’ve learned more about buying scrollsaw blades from the article starting on page 56, here’s a convenient way to keep those similar-looking blades separated, organized, and close at hand.

Using the dimensions on the Exploded-View Drawing at left, cut the base to size from ⅛” stock and the top from 1⅜” material. Mark a pair of reference lines along the top edge of the top piece. Locate hole centerpoints for your blades, wrenches, and other accessories along the two reference lines where shown at left. Draw a ¾” radius on the top corners of the top piece and cut each to shape. Rout ⅛” round-overs along the edges of the base and top piece where shown on the drawing. Using a drill press, drill the holes in the top piece. Sand both pieces smooth. Then, mark scrollsaw-blade reference numbers on the side of the top piece with a permanent, fine-tipped felt marker. Drill the mounting holes, and glue and screw together the two pieces. Apply a clear finish and add your blades.

Illustration by Kim Downing

---

DELTA

24-702 16" 3 HP UNASAW W/UNIFENCE 10-3/8" 10 HP UNASAW W/UNIFENCE 13-275 8" 3 HP UNASAW JET 92550 8" 3 HP UNASAW 13-720 12" RASAL SAW ARM 8-3601 15" VS SCROLL SAW 13-865 10" RADIAL ARM SAW 13-26-1 32" 3 HP PLANER 55-175 5 HP DUST COLLECTOR 50-100 1 HP DUST COLLECTOR 56-161 2 HP DUST COLLECTOR 54-049 1 HP STOCK FEEDER 110V 54-054 1 HP STOCK FEEDER 230V 54-055 3 HP STOCK FEEDER 230V 13-115 8-1/4" BUCK 13-24-1 10" GROUND SAW COMPLETE 13-312 4" X 12" SLED SANDER 13-390 13" T-SLOT T-SANDER 40-100 15" SCROLL SAW 51-760 12" BLOCK SANDER 52-710 WET DRY GRINDER 4-5576 5" 1/4" SLED SANDING 17-500 16-1/2" DRILL PRESS 51-687 CALL FOR LOW PRICES

EMGLO

AND9HCV1/2 HP TWIN TANK 3320 AND9HCV1-12 HP TWIN TANK 238

BOYSH

1611 3 HP PLANER ROUTER 5103 1610 1-3/4 HP ROUTER 119 1608 1-1/2 HP ROUTER 100 1606 1-3/8 HP HANDLE ROUTER 125 1604 3/8" AXLE SANDER 174 1600 3 IN 1 INCH SANDER 103 32724 3 3/4" SANDER W/BACK 125 12722 3 3/4" SANDER W/BACK 168 12723 3 3/4" SANDER W/BACK 168 921VSOS 4 1/2" VARIABLE SPEED SANDER 119 915VGK 7 1/4" MIGHTY MIDGET SURF 106 1657 4 1/2" SANDER W/BACK 124 1654 7 1/4" SAWS W/BACK 96 1651VS 10" HANDLE SANDER 127 102VSOS 6 1/2" SANDER W/BACK 129

HITACHI

C-13FB 1/2" COMPOUND MITER SAW 569 C-13FB 15" MITER SAW 359 TR-12 3HP PLUNGE ROUTER 167 W/ACESS, VALUE AT 360

MAKITA

LS1020 10" MITER SAW 2029 LS1440 14" MITER SAW 439 5012 10" SAWS 339 5012NA 10" 10 1/4" CIRC SAW 209 5015NA 15 1/4" CIRC SAW 399 5017B 7 1/4" CIRC SAW 114 5017VRA 7 1/4" CIRC SAW W/6PC BRACE 111 5019WR 5 1/2" PLAIN SAW 113 270WS 6 1/4" TABLE SAW 267 350WS 3 HP PLANER 153 351B 1-3/8" HP PLANER 137 352 1-3/8" 1/2" PLANER SANDER 139 900WB 3 1/4" 1/2" SANDER W/BACK 139 351B 3 1/4" 1/2" SANDER W/BACK 145 352B 3 1/4" 1/2" SANDER W/BACK 139 900WB 3 1/4" 1/2" SANDER W/BACK 162 900WV 3 1/4" 1/2" VERT SANDER 153 350WV 3 1/4" 1/2" VERT SANDER 153 5017VRA 7 1/4" CIRC SAW W/6PC BRACE 539 5019WR 5 1/2" PLAIN SAW 539 270WS 6 1/4" TABLE SAW 539 350WS 3 HP PLANER 539 351B 1-3/8" HP PLANER 539 352 1-3/8" 1/2" PLANER SANDER 539 900WB 3 1/4" 1/2" SANDER W/BACK 539 351B 3 1/4" 1/2" SANDER W/BACK 539 352B 3 1/4" 1/2" SANDER W/BACK 539 900WB 3 1/4" 1/2" SANDER W/BACK 539 900WV 3 1/4" 1/2" VERT SANDER 539 350WV 3 1/4" 1/2" VERT SANDER 539

LEIGH DOVETAIL JIGS

D1256-12—List 314.00—Sale 265.00 D1256-24—List 375.00—Sale 295.00 LEIGH INSTRUCTIONAL VIDEO—SALE 29.00

FREUD

46-100 PLATE JOINER W/CHANGE 169 96-118 DOOR SYSTEM ROUTER SET 278 96-119 DOOR SYSTEM ROUTER SET 150 96-127 7 PC FURNITURE SET 46 96-131 7 PC FURNITURE SET 46 96-137 7 PC FURNITURE SET 150 58-800 8 1/4" DADO SET 120

POWERCABLE

330 SPEED BLOCK SANDER $9.55 331 3 1/2" SANDER 11.50 332 3 1/2" SANDER W/BACK 12.50 360 3 1/2" SANDER W/BACK 17.50 320 3 3/4" SANDER W/BACK 14.25 321 3 3/4" SANDER W/BACK 15.25 322 3 3/4" SANDER W/BACK 18.25 557 7" SAW 13 AM 11.50 558 7" SAW 13 AMP 11.50 559 7" SAW 8 AMP 12.50 561 4 1/2" TRIM SAW 12.50 562 4 1/2" HD SPINDLE 12.50 9118 PORTA PLANE KIT 185 9119 PORTA PLANE KIT 185 9120 PORTA PLANER KIT 185 9121 PORTA PLANER KIT 185

PORTER-CABLE

PORTER-CABLE

302 SPEED BLOCK SANDER $9.55 303 3 1/2" SANDER 11.50 304 3 1/2" SANDER W/BACK 12.50 305 3 1/2" SANDER W/BACK 17.50 306 3 3/4" SANDER W/BACK 14.25 307 3 3/4" SANDER W/BACK 15.25 308 3 3/4" SANDER W/BACK 18.25 557 7" TORCH 13 AM 11.50 558 7" TORCH 13 AMP 11.50 559 7" TORCH 8 AMP 12.50 561 4 1/2" TRIM SAW 12.50 562 4 1/2" HD SPINDLE 12.50 9118 PORTA PLANE KIT 185 9119 PORTA PLANE KIT 185 9120 PORTA PLANER KIT 185 9121 PORTA PLANER KIT 185

TARHEEL FILING CO., INC.
CALL TOLL FREE 1-800-322-6641 LOCAL 919-831-2678

POWEROMATIC ARTISAN SERIES CALL FOR LOW PRICES

POWEROMATIC POWEROMATIC

Model 66 Table Saw

50" Bisoumerly Rip Fence, 3HP 1PH or 3 HP, 1 PH motor Knob Adjuster, Sectional Roll and Chipbreaker.

PLEASE MENTION THIS AD WHEN YOU CALL

ORDERS PLACED BY VISA, MASTERCARD, GASHIER
CHECKS OR MONEY ORDERS WILL BE SHIPPED
THE SAME DAY, ALLOW 2-3 WEEKS FOR
PERSONAL OR COMPANY CHECKS.

FREE FREIGHT ON PORTABLES (CONT. U.S.A. ONLY)

MAIL CHECKS OR MONEY ORDER TO TARHEEL FILING
4800 LAKEWOOD DR, P.O. BOX 27903
RALEIGH, NC 27611

919-831-2678

NO COD'S PLEASE, ERRORS SUBJECT TO CORRECTION
5-PIECE ROUTER BIT SETS FOR THE INCRA-JIG

Available exclusively from Cascade and made specially for the famous Incra Jig, these sets consist of all the straight and dovetail bits you will need to make your fancy joints. Both sets come in a handsome wooden case to organize and protect your bits. Famous quality for lasting performance!

SET 1 — Made for small joints in 1/4” SHANK:
- 1/4” Straight (carbide-tipped)
- 3/8” Straight (carbide-tipped)
- 1/4” Dovetail 7° (special tool steel)
- 3/8” Dovetail 14° (carbide-tipped)
- 1/2” Dovetail 14° (carbide-tipped)

PART NO. C1507  ONLY $34.95

SET 2 — Made for large joints in 1/2” SHANK:
- 5/16” Straight (carbide-tipped)
- 3/8” Straight (carbide-tipped)
- 1/2” Dovetail 14° (carbide-tipped)
- 5/8” Dovetail 7° (carbide-tipped)
- 3/4” Dovetail 7° (carbide-tipped)

PART NO. C1508  ONLY $37.95

Dealer’s inquiries invited.

CASCADE TOOLS, INC.
Box 3110
Bellingham, WA 98227
1-800-235-0272
or (206) 647-1059

WOODWORKERS

Jennings Products has NEW IDEAS to make your projects more professional looking without having to increase your skill level. Our system is also an excellent money maker for either full or part time shops. We not only have project plans, but plans for jigs and fixtures to mass produce with PLUS FREE 4-color brochures to help product sales. PLUS an in-depth supply of silkscreens especially designed for our wood products. Turn a $3.00 piece of wood into a $10.00 plaque with these silkscreens. It only takes a few minutes to make the jig (from scrap plywood) and learn how to screen. Our products are inexpensive and easy to use. Slant-top breadboxes and wall clocks, grist mills and blacksmith shops are only a few samples of our products and screens. Send for the whole story. IT’S FREE.

JENNINGS PRODUCTS
P.O. Box 1121, Dept. WO-1
Hendersonville, TN 37077-1121

Woodworker’s Supply
5604 Alameda Place, NE
Dept. WO11
Albuquerque, NM 87113
505-291-0500
1-800-645-9292
FREE GIFTS
Earn Coupon(s) every time you order! Exchange them for FREE shop tools & equipment - immediately as you order or accumulate them for more lavish gifts.
To Earn Coupons:
Order $25-$49.99 - get 1 coupon
* $50-$74.99 - get 2 coupons
* $75-$99.99 - get 3 coupons
* $100-$124.99 - get 4 coupons - etc.

20 Gifts to choose from...
Don't want to collect coupons? Redeem as you order:
1 coupon: wire brush, brad driver, scratch awl
2 coupons: 12" mini pry bar, safety goggles
4 coupons: 7 pc. pipe saw (1-3/4"), 1/2" pipe clamp (no pipe)
6 coupons: staple gun

MULTI-GROOVE DOWEL PIN (2)

WHEELS & AXLE PEGS (8)

PLAY BALL
Our baseball/softball features a ball and mitt holder plus room to store 2 bats - complete with music that plays "Take Me Out To The Ball Game."

NOTE: Parts Kits include only necessary parts - no lumber.

CRAFTER'S MART • P.O. BOX 2342W • GREELEY, CO 80632

46-Page CATALOG: $2.00 with credit against first order, FREE with any order. MINIMUM ORDER: $20 - Check, MasterCard or Visa (include card no., exp. date, signature and daytime phone). CO residents add 3% tax. No C.O.D.s. PROCESSING CHARGE: $4 - provide UPS street address, Alaska, Hawaii, APO & FPO add $10 Processing Charge; Canada add $16. Foreign orders pay US funds plus 25% & $10 Processing Charge. PHONE ORDERS: 8 a.m. - 5 p.m. Mon. - Fri. MST: INFO: (303) 951-0676

1 - 800 - 999-3445

WOODWORKERS EMPORIUM
8888 N. MILWAUKEE AVE.
NILES, IL 60648
(312) 824-0565

R. A. NESS & CO.

ORDER NOW - TOLL FREE
1-800-767-4747 24 HRS
VISA / MC / AMEX
Or mail check to:
SKY CROFT TOOLS, INC.
P.O. BOX 418 W
Myersville, MD 21773-0418

FULL-SIZE PROFESSIONAL PLAN
ADIRONDAK CHAIR

TUNGSTEN CARBIDE ROUTER BITS
• Heavy Duty Industrial Quality
• 1/4 by 1-1/4 inch long shafts
• Enclosed Ball Bearing Guides
• Bits pass ATCS Std. 103

Corner Round-over
Radius Price
1/4" $12.50
3/8" $13.75
1/2" $14.50

Cove Bits
Radius Price
1/4" $14.50
3/8" $15.50
1/2" $17.00

45° Chamfer Bits
Diameter Price
1" $12.00
1-1/4" $14.00
1-1/2" $15.50

100% Money Back Guarantee

MODEL 31-460
4" Belt/6" Disc Sander.
SALE $149.95 ppd
FREE CATALOG SUBSCRIPTION WITH PURCHASE.

CATALOG ONLY.
2 year subscription (8 issues) $4.00.
Free $5.00 gift certificate with catalog order.

WOODWORKERS EMPORIUM
8888 N. MILWAUKEE AVE.
NILES, IL 60648
(312) 824-0565

BAND SAW BLADES WELDED TO YOUR EXACT LENGTH
Complete Band Saw Blade Line Including Saw Mill Blades
We also carry:
Scroll Saw Blades • Hand Saws
Circular Saw Blades • Hose Saws
Hack Saws • Sanding Belts
Sanding Disks • Router Bits
Files • Rasp • Scrapers

SEND $1.00 FOR CATALOG or TO ORDER PHONE OR WRITE TO:
BUCKEYE SAW COMPANY
P.O. BOX 1474
CINCINNATI, OHIO 45250-0794
1-800-543-8664 (Except Ohio)
1-513-621-2159 (In Ohio)

WOOD-MIZER®
World's Largest Manufacturer Of Portable Sawmills

BAND SAW BLADES WELDED TO YOUR EXACT LENGTH
Complete Band Saw Blade Line Including Saw Mill Blades
We also carry:
Scroll Saw Blades • Hand Saws
Circular Saw Blades • Hose Saws
Hack Saws • Sanding Belts
Sanding Disks • Router Bits
Files • Rasp • Scrapers

SEND $1.00 FOR CATALOG or TO ORDER PHONE OR WRITE TO:
BUCKEYE SAW COMPANY
P.O. BOX 1474
CINCINNATI, OHIO 45250-0794
1-800-543-8664 (Except Ohio)
1-513-621-2159 (In Ohio)

FREE
In Indiana call: (317) 271-1542
44-page catalog or use your MasterCard or Visa to order our 50-minute demonstration video - $10.00
Wood-Mizer Products, Inc., Dept. ODI
8160 W. 10th St. Indianapolis, In 46214-2430

OWN YOUR OWN SAWMILL
Four Models To Choose From
BUY DIRECT
1(800) 553-0219

100% Money Back Guarantee
Buy 12 "EVER-LAST" Belts...  
Get 12 Belts FREE!

Need ROLLS, WIDE BELTS, DISCS, SLEEVES, STROKE BELTS, etc.  
Write for catalog.

Belt available in 35, 50, 60, 80, 100, 120, 150, 180, 220, 320 grit sizes.  
Please specify grit sizes when ordering, otherwise an assortment will be supplied.

- 100 x 30... $15.95/Dz. + 12 FREE
- 100 x 36... $15.95/Dz. + 12 FREE
- 2 x 48... $17.95/Dz. + 12 FREE
- 2 x 60... $17.95/Dz. + 12 FREE
- 2 x 80... $17.95/Dz. + 12 FREE
- 2 x 100... $17.95/Dz. + 12 FREE
- 2 x 120... $17.95/Dz. + 12 FREE
- 2 x 150... $17.95/Dz. + 12 FREE
- 2 x 180... $17.95/Dz. + 12 FREE
- 2 x 220... $17.95/Dz. + 12 FREE
- 2 x 320... $17.95/Dz. + 12 FREE
- 2 x 400... $17.95/Dz. + 12 FREE

Shipping Charges: Under $50.00 add $4.75. $50.00 or over add $9.55. Pennsylvania residents add 6% sales tax. Minimum order $25.00.

□ Money Order □ Check □ MasterCard □ Visa

9" x 11" PAPER SHEETS
A4 or Semi-Cabinier Paper
50 PACK 100 PACK

40-D... $17.00 $31.00
50-D... $16.00 $25.90
60-D... $15.00 $25.90
80-D... $13.00 $24.90
100-C... $13.00 $24.00
120-C... $13.00 $24.00
150-C... $13.00 $24.00

No Load Finishing Paper (White)

120-C... $14.00 $24.00
150-C... $14.00 $24.00
180-A... $14.00 $24.00
220-A... $14.00 $24.00
280-A... $14.00 $24.00
320-A... $14.00 $24.00
400-A... $14.00 $24.00

INDUSTRIAL ABRASIVES CO.
643 N. 8th ST. • READING, PA 19612

DUST COLLECTION ACCESSORIES

UNIVERSAL & JOINTER EXHAUST HOODS (4" outlet)
MODEL G1838 61/4" x 61/4" Hood $9.95
MODEL G1839 Fits over 31/4" x 31/4" Chute $9.95
MODEL G1841 Fits over 71/4" x 71/4" Chute $11.95

TABLE SAW EXHAUST HOOD
These 12" x 12" hoods fit on the inside of the table saw with the 4" outlet facing down. Fits almost all 10" and 12" contractor-type saws with open stands.

MODEL G1837 ONLY $14.95

BLAST GATES
We are the largest suppliers of Dust Collector Blast Gates in the U.S.A.
3" MODEL G1842 ONLY $6.95
4" MODEL G1843 ONLY $7.95

FLOOR SWEEP SYSTEM
Install these sweeps at different locations in your shop and fight over the broom at the end of the day!
- 22" wide sweep
- Stick base to floor with 2-duct tape.

MODEL G1840 ONLY $12.95

CALL TOLL FREE:
1-800-523-4777 (East of the Miss.)
1-800-547-5537 (West of the Miss.)

"Jorgensen®" AND "Pony®" CLAMPS

Dependable extra hands for all types of clamping and work-holding jobs: Woodworking Projects, Home Maintenance, and Furniture Repair.

Write for FREE LITERATURE.  
For big 32-page "how-to-clamp-it" catalog, send $1.00.

ASK YOUR DEALER

ADJUSTABLE CLAMP COMPANY
THE CLAMP FOLKS
410 N. Ashland Avenue • Chicago, IL 60622

WOOD MAGAZINE  APRIL 1990

83
Tell 'em you love wood
Here's a way to tell the world that you're a woodworker and proud of it: sturdy, two-ply wooden calling cards. Cards of Wood will print your business card's message onto cards made from up to 120 varieties of wood. My favorites: Eastern red cedar, western juniper, citrus, yew, Atlantic coast cedar, aspen, and bird's-eye maple. Some open-grain species, such as red oak, white hickory, and white ash, don't accept ink as well as most closed-grain species. You can order an assortment of woods or just one species. Colors other than black cost extra.
—Tested by Bill Krier

Wood calling cards, $63 ppd. for 200 cards (one-color), $213.50 ppd. for 1,000 cards (one-color); add $23 per extra color. Cards of Wood, 1267 House St., Belmont, MI 49306. Call 800-253-6002 (616/887-7910 for FAX orders).

Insta...
WHO SAYS YOU CAN'T TAKE IT WITH YOU...

INTRODUCING THE FIRST TRULY PORTABLE PLANER-MOLDER

FOR UNDER $400.00

THE GO ANYWHERE PLANER!

From your shop... to the job site, Foley-Belsaw's NEW Portable Planer-Molder goes where you need it, and at a price affordable to all woodworkers. Easily pays for itself over and over again, by milling low cost rough lumber into valuable finished stock and moldings. Plane and mold wood up to 6" wide and 4 3/8" thick and up to 12" wide by taking advantage of the unique open side design. You can even mold all four sides of a raised panel! All with Power Feed! When you buy a Foley-Belsaw Portable Planer-Molder you get:

- Superior "American Made" Construction
- Full One Year Factory Warranty
- Low "Factory Direct" Introductory Price (Limited Time Only)

To find out more about the "NEW" Foley-Belsaw Portable Planer-Molder, mail the coupon below. We'll rush you a FREE Information Kit with all the facts and details. There is no obligation, so ACT NOW!

SAVE BIG! FACTORY-DIRECT-PRICES

FREE INFORMATION COUPON

FOLEY-BELSAW COMPANY 6301 Equitable Rd. Dept. 91517 Kansas City, MO 64120

☐ YES, please send me the FREE Information Kit that gives me complete facts about your 6" Portable Planer-Molder and full details on how I can qualify for a 30-Day Free Trial right in my own shop. I understand there is no obligation and that no salesman will call.

Name __________________________ 
Address ________________________________________
City ___________________ State ______ Zip ________ 

Send in Your Coupon TODAY and Receive a FREE Information Kit of Facts & Full Details!
A user-friendly wood putty

Unlike some wood putties that contain pungent-smelling, toxic, and flammable solvents such as acetone, water-based Elmer’s Fill ‘N’ Finish releases a nontoxic and nonflammable vapor that has a mild ammonia-like smell. And, I found the product to be consistent in mixture, even after sitting on a shelf for weeks.

Once applied, it dried quickly, sanded superbly, took a stain well, and didn’t shrink excessively. When finished, I cleaned up the putty knife with water. And, to top it off, Elmer’s places a small, but handy tips pamphlet on the outside of every lid.

However, I hope Elmer’s comes out with a greater variety of colors. You can only buy the putty in two shades: dark and light tan.

—Tested by Jim Boelling

Elmer’s Fill ‘N’ Finish Wood Filler (putty), available at discount and hardware stores nationwide. Suggested retail prices: ¼ pint, $2.49; ½ pint, $3.49; and 1 pint, $5.19.

Big performance from a small turning tool

Although I turn mostly projects of goblet size or larger, I found Robert Sorby’s micro turning tools invaluable for detailing cuts and those occasional miniature projects. Constructed in Sheffield, England, of high-speed steel and sturdy ash handles, the tools follow in the same high-quality tradition as Sorby’s larger tools.

The 10”-long tools have 4” blades that vary from a ¼-wide cut for the parting tool to a ¼-wide cut for the roughing-out gouge, roundnose scraper, and skew chisel. The spindle gouge has a ½”-wide blade. Because of their dainty size, sharpening them presented a challenge. You must take care not to burn the blades by placing excess pressure against the grinding stone.

—Tested by Marlen Kemmet

Sorby’s five-piece micro-turning tool set, catalog No. STT45, $70.60 ppd. from Constantine’s, 2050 Eastchester Rd., Bronx, NY 10461. Tools also available individually. Call 800-223-8087 (orders only) or 212/792-1600 for information.

Continued on page 88
Finally A Solution
to accurately setting
your table and radial arm saw

Produce fast and professional
results when setting your power
tool with PARAGAUGE.

PARAGAUGE accurately sets table
saws, radial arm saws, band saws,
drill presses and router tables by
providing perfectly parallel
measurements up to 10 inches
in width.

If you’re tired of setting and
re-setting a rip fence to obtain
that perfect measurement, then
PARAGAUGE was developed
just for you.

Why spend hundreds on complex and permanent fence systems when
PARAGAUGE is completely portable and will produce the same results at a
fraction of the cost.

A must for every woodworker from the HOME HANDYMAN to the PROFESSIONAL.

1/2" Shank Carbide-Tipped Router Bits

Moulding Plane Profiles

ITEM #962 $27.95
ITEM #963 $27.95
ITEM #954 $27.95
ITEM #955 $27.95

SPECIAL OFFER: SET OF ALL FOUR BITS $99.95 ORDER ITEM #966. Set of four quickly
produce classic traditional mouldings. Bits are shown Full Size - 2 flute Carbide Tipped.
Order by VISA / MasterCard, 7 Day / 24 Hour Service, Call 1-800-533-9298
or send check to: MLCS Ltd., P.O. Box 40533D, Rydal, PA 19046

The Basics
Of Cabinetry
Table Saw
- Rips
- Miters
- Finger Joints

Spindle Shaper
- Raised Panels
- Moldings

Jointer
- Glue-ups
- Fencing

Thickness Planer
- Dimensions
- Smooth Finish

Mortise Table
- Slot Mortises
- Precise Doweling

Call or Write for
Complete Details
on This Remarkable
Compact Workshop
800-USA-KITY

NEW INFINITELY VARIABLE
CONVEYOR FEED gives you total
control...eliminates oversanding at
first and last few inches of a board!

NEW FELT-BACKED ABRASIVE
mounts in just seconds to Velcro
covered drum! The harder you
sand, the tighter it stays!
Eliminates stretching...allows fast
removal and re-use!

At last! A complete power-feed Drum Sander at an
affordable price! Choose from 26" and 36" models. SAVES
TIME...IMPROVES RESULTS.
Use this high-tolerance machine for
light dimensioning as well as the
finest finish work. Now you can
add new beauty to any woodworking
project...save hours of tedious
hand sanding! In a matter of
seconds you can produce a satin
smooth finish impossible to duplica
te with hand methods or hand
held power sanders...no more low
spots, waves or cross-grain marks!

FREE FACTS! Send the complete facts on how
you can try this low-cost tool in your own shop for
one full month without risk. See how the sander can dimension and finish sand
your cabinet pieces, resawn stock, paneling, toys, tabletops, knees, bunts, crotches
and much, much more! Made in U.S.A. Easy Terms.

Call Toll Free 1(800)538-4200, Ext RW36

New!
Conveyor Drive
with Infinitely Variable Power Feed!
Here's my nominee for time-saver of the year. Instead of a reversible stile-and-rail cutter, why not twin cutters? Bosch's separate stile-and-rail cutter heads for 1/2" routers mean no time wasted reversing shims and cutters. A switch from stile to rail cuts comes by changing bits and positioning the workpiece. In most cases, you only need to do a small amount of measuring and test-cutting for a tight fit. Plus, with Bosch's quality carbide-tipped bits, you'll have a tool that will last.

The twin-bit sets come in beading and ogee-head styles. For those more interested in saving money than time, you can reverse a single ogee bit to make both stile and rail cuts, but that option isn't available with the beading bits.

—Tested by Steve Oswalt

Bosch beading and ogee stile-and-rail cutters, $129.50 list price per set at hardware stores nationwide. Check the Yellow Pages for your nearest Bosch dealer.

---

Wood glue of a darker shade

The strength and chocolate hue of Elmer's dark wood glue make the product ideal for use with oak, cherry, mahogany, walnut and other hardwoods. It has all the properties of Elmer's regular wood glue, plus its color helps hide thicker glue seams that often occur in laminations, especially those made of darker woods.

—Tested by Steve Oswalt

Elmer's dark wood glue, $3.19 suggested retail price for an 8-oz. container, available in hardware and department stores nationwide.

---

A sharp bargain

Wet or dry, these synthetic stones put a quick edge on any cutting tool. The super hard, bonded aluminum oxide cuts quickly and refuses to dish-out. The ultrafine white stone added polish to my carving edge, but medium black was clearly the workhorse. The slips and specialty stones fit neatly between saw-blade teeth and other hard-to-reach cutting areas.

—Tested by Steve Oswalt

Wayne Barton's ceramic sharpening stones and slips $18.95-$27.95 from Woodcraft, Dept. WBH, 210 County Industrial Park, P.O. Box 1682, Parkersburg, WV 26102. Call 800-225-1153.
Innovation ...as simple as 1-2-3

1. 'Cuda® ULTRA THIN CARBIDE TIPPED BLADES.
   'Cuda's superior design combines horizontal teeth, open gullets, and ultra thin body for a carbide blade surpassed by none. 'Cuda's cutting and chip removal action reduces friction for faster, smoother cutting and no splintering.

2. Drill Team System™
   FEATURING X-360™ DRILL BITS.
   The Drill Team System™ offers a series of X-360™ drill bit sets from 1/16” through 1/2” diameter, a wood boring bit set, and a masonry bit set. All of these sets fit neatly into the storage base included with set #1.

   The heart of the Drill Team System™ is the X-360™ drill bits, which last four times longer and drill four times faster. The split-point bits start drilling immediately without wandering. Unique parabolic flutes are designed for better chip ejection, which allows the bit to drill deeper.

3. RIB-BIT™ SURE-GRIP POWER SCREWDRIVER BITS.
   RIB-BIT™ has a special ribbed-tip surface for increased grip power to reduce cam-out and uncontrolled spinning. Each bit is Tough-Tempered™ to eliminate brittleness. RIB-BIT™ lasts 6 times longer, with a fracture-resistant tip for increased strength and greater durability.

...and only Credo® has them

THE
CREDO
COMPANY

AVAILABLE AT MOST FINE HOME CENTERS INCLUDING:
Fred Meyer, H & E DIY Home Centers, Gibsons, Sutherland Lumber, Pay 'N Pak, Yardbirds, McCoy's, Grossman's, Orcschn, Thurman, Skagg's Home Centers, Hacienda Home Centers, O'Malley's, Foxworth-Galbraith, Marvin's, Busy Beaver, Acc, Cashway Lumber, Cumberland, Revelstoke, Westlakes, Riverside, National Lumber, Paty Lumber, Fedco, Menards, or write.

2765 National Way
Woodburn, Oregon 97071
Go Ahead, Make My Day, Easier!

HOT MELT GLUE GUNS

Make repairs a snap with the most comfortable and versatile Hot Melt Glue Gun going. The unique design keeps heat flow away from handle so it doesn't get too hot to handle as others do.

Bond almost anything permanently in 60 seconds without the need of mixing or clamping. You can replace bathroom tile, repair leather goods, toys, seal packages, fix furniture, glue picture frames, and it's the ideal tool for arts and crafts projects.

ARROW FASTENER COMPANY, INC.
271 Mayhill Street, saddle Brook, NJ 07662
In Canada: Jardel Distributors, Inc., 8505 Metropolitan Blvd. East, Montreal H1P 1X9 Quebec.

* Copyright 1988 Arrow Fastener Company, Inc.
This VET Did It - and YOU Can Do It Too!

"War injuries left me badly handicapped, but now I'm a financial success as a Locksmith, thanks to your training. Besides, the work is fascinating, if I can do it anybody can..."

Glen Johnson, Larned, Kan.

Train FAST at Home!

Be a LOCKSMITH!

If you enjoy fixing things, you're a "natural" to make hundreds of EXTRA DOLLARS a year in the fascinating business of Locksmithing. Rising crime has increased demand for service a thousandfold. Yet there's only one Locksmith for every 17,000 people!

COLLECT CASH PROFITS ALMOST AT ONCE!

You're "in business" ready to make $10 to $25 an hour a few days after you begin Foley-Belsaw's shortcut training. Easy illustrated lessons complete with ALL practice equipment PLUS

- ALL TOOLS YOURS TO KEEP
- KEY MACHINE YOURS TO KEEP
- EXPERT PERSONAL ASSISTANCE
- BUSINESS-BUILDING HELP

MAIL THIS COUPON for your FREE book, Keys to Your Future.

Name:
Address:
City State Zip

This Do-All Pro Key Machine Yours TO KEEP!

Can add $50 to $100 a week to your income and doesn't cost you a penny extra!

Mail this coupon...

MAIL this COUPON to Foley-Belsaw Institute

FOLEY-BELSAW INSTITUTE
6391 Epiphany Rd., Dept. 1157
KANSAS CITY, MO. 64114

Rush FREE book, "Keys to Your Future."

AMITY® WIPE-ON/BRUSH-ON POLYFINISH

A WATER-BASED Finish designed for HAND APPLICATION - WIPE-ON or BRUSH-ON

AMITY Polyfinish is available in Clear Gloss and Clear Semi-Gloss

1-Gal $10.95 ea. 1-Qt $8.95 ea.

Circle To Order or For More Information:

US 703-436-8248
WI 603-757-8448
AMITY QUALITY RESTORATION SYSTEMS, INC.
P.O. BOX 148 - 1707 IVORY DR.
SUN PRAIRIE, WI 53590

WAGNER SAFE-T-PLANER®

For Drill Press or Radial Arm Drill

Surface Planes, Tenons, Rebates, Moulding, Rosettes, Raised Panels

ABSOLUTELY SAFE and no kick back

Drill Press Kit $49.00
Radial Saw Kit $45.00

ASK YOUR DEALER FOR DETAILS

EMPEROR CLOTH COMPANY

World's Largest Manufacturer of Grandfather Clock Kits

FAIRHOPE, ALABAMA 36532 Phone 1-205-928-2216

I am interested in:

☐ Do-It-Yourself Kit ☐ Finished Clock ☐ Finished Furniture

Name ____________________________
Street __________________________
City ____________________________
State ____________________________
Zip _____________________________

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

MAIL ORDER FORM TO:

THE FINE TOOL SHOPS
P.O. BOX 7091-PY
PORTSMOUTH, NH 03801

ORDERING INFORMATION:

I-800-593-9305
Mastercard □ Visa □ Amex
Card No. ________________________
Expires _________________________
Name __________________________
Address _________________________
City ____________________________
State __________________________
Zip _____________________________

Woods Magazine April 1990
Safety is the name of the finishing game

From coast to coast, manufacturers of finishing products have safety on their minds. The reason: Since the 1960’s, when certain air districts in and around major cities in California limited the content of volatile organic compounds (VOC) in finishing products sold in those areas, at least five other metropolitan areas have enacted similar limits. Today, Chicago, Dallas, New York City, Phoenix, and the entire state of New Jersey, have similar limits.

And, what is a VOC? With finishing products it’s the hydrocarbon-based solvents used to disperse the solids. These solvents contribute to a number of environmental problems, including ozone buildup in the lower atmosphere.

Manufacturers expect VOC legislation to spread nationwide, and in the ensuing rush to lower the VOC content of their products, manufacturers have improved the performance levels of safer, water-based finishes. These products are nontoxic, nonflammable, relatively odorless, and they clean up in soap and water.

“This is the way it’s going to be,” said Fred Adams, a spokesperson for Parks/Carver Tripp, a company that recently introduced an entire family of water-based stains, finishes, and finish remover that the company has dubbed its “Safe and Simple” line. “Water-based finishes aren’t new,” Adams told us, “but water-based products that perform for the consumer are new.”

For more information on this topic, and news about one woodworker who has mastered the use of a water-based finishing product, see page 42.

Bosch and Emerson acquire Vermont-American

Two of the world’s biggest names in power-tool making, Robert Bosch Power Tool Corporation and Emerson Electric, have pooled their resources to purchase Vermont-American, one of the biggest names in power-tool accessories. Bosch, headquartered in Stuttgart, West Germany, and St. Louis-based Emerson now await Justice Department approval before the deal becomes final. To make the offer, Bosch and Emerson formed the Maple Acquisition Corp., through which both companies will jointly manage Louisville-based Vermont-American and its subsidiaries. Purchase price: $440 million.

Currently, Vermont-American operates 28 plants in North America, Europe and Australia, and counts blade-manufacturer DML among its divisions. V-A makes many of Sears’ power-tool accessories, such as drill bits and saw blades. Bosch, one of the largest manufacturers in Europe, produces portable tools in Germany and New Bern, N.C. Emerson manufactures most of Sears’ stationary power tools, supplies induction motors to many manufacturers, and also owns Skil and Dremel. Officials of the involved firms wouldn’t comment on what effect, if any, the sale will have on any of their product lines.
Unlock your creativity and let your woodworking dreams come true with the RBI Hawk Precision Scroll Saw. The whole family can join in on the fun, making charming toys, handsome heirlooms, and practical household items to save money... and even earn it!

It's so easy to use, even the kids will enjoy hours of safe-vibration free cutting. They will learn responsibility and a sense of accomplishment with every project they complete. You'll enjoy the precision that is built right into every Hawk—make cuts so smooth you'll never want to sand your projects again!

Folks will tell you your projects are so fantastic "you should sell them!" and you just might want to... many others have!

Start your own business in the garage or basement, or just enjoy the savings on every project you complete! Don't wait another day to find out how the entire family can have fun and earn extra money with the Hawk in your workshop.

Fill out the coupon and mail today, or for faster service call FREE at 1-800-535-8665.

Yes! Please rush me all the facts telling about the full line of Hawk Precision Scroll Saws and how I can turn my hobby into income!

Name

Address

City        State        Zip

Phone
WINDMILL TOOL & HARDWARE SUPPLY
Serving Woodworkers since 1946
2017 White Settlement Road
Fort Worth, Texas 76107

Call For Free Catalog!
800-338-6668

DELTA
34-444 10" Contractors Saw $558
34-445 10" Contractors W/Unifence 799
34-762 3HP Unisaw W/Unifence 1558
34-763 3HP Unisaw W/Lockout Fence 1449
34-781 1-1/2HP Unisaw W/Unifence 1419
34-781 1-1/2HP Unisaw W/Lockout Fence 1249
38-263 3/4" HP Band Saw W/Enclosed Base 684
38-265 1-1/2HP Band Saw W/Enclosed Base 519
33-950 10" Radial Arm Saw 579
33-363 5" Jointer DJ345 1499
37-154 6" Jointer DJ65 959
17-900 16" Drill Press 349
43-376 1-1/2 HP Speed Shaper 1249
32-100 Plate Biscuit Jointer 479
33-681 12" Thickness Planer 329
33-050 Sawbuck 507
40-661 18" Electronic Scroll Saw 678

ELU
33-39 2-1/4HP Electronic Plunge Router $299
33-04 1HP Electronic Plunge Router 200
43-29 3201 Electronic Belt Sander 205
33-75 Universal Planer 195
33-06 Jointer/Spindle 329

PORTER CABLE
690 Speed Biscuit Sander $54
692 1-1/2 HP Router 120
100 7/8 HP Router 90
691 1-1/2 HP D-Handle Router 124
193 Pace Jointer 139
7048 VS Bayport Saw Top Handle Orbital 159

RYOBI
AF10 10" Surface Planer $329
EC200 1HP Electronic Router 195
BE321 3x2" Electronic Belt Sander 123
JP-155 6" Bench Motorized Jointer 228

BOSCH
1602K Router Kit-Installers 4 in 1 $169
1604 3-3/4" HP Router 119
1611 3 HP Plunge Router 163
1606VS Orbital Jig Saw VS Top Handle 127
127GDS 4"24 VS Belt Sander 185

HITACHI
T1212 3HP Plunge Router Kit $169
C15FB 15" Miter Saw W/Accessories 389
CEB1 8" Compound Miter Saw 495
CB9S Pasla Band Saw 1568
F1000A 12" Jointer/Planer Combination 1499

WOODWORKER'S DREAM
EXOTIC & DOMESTIC HARDWOODS
SAWN VENEER AND RARE LUMBER
1/8", 1/4", 1/2", 3/4", 1", or 2" & Custom Sizes

OVER 30 SPECIES AVAILABLE
Sanded, Rough or Resawn
NO MINIMUM ORDER • QUANTITY DISCOUNTS APPLY
• COMPLETE SAWMILL SERVICES AVAILABLE •
CALL US TOLL FREE (800) 247-6931
PENNSYLVANIA RESIDENTS CALL (215) 759-2837

A DIVISION OF THE MARTIN GUITAR COMPANY, NAZARETH, PA 18064

Wood Moisture Meters

**If wood is not dry enough...**
Moisture problems such as shrinking, warping, checking, open joints or dry rot can ruin any masterpiece.

You can protect your work by using the Mini-Ligno moisture meter to make sure all wood is "certified" dry. For more info or a brochure call **800-227-2105**.

Phone and mail orders welcome.

PO. Box 30145-bh
Portland, OR 97230
503-257-8957
800-227-2105

Lignomat USA Ltd.

FOR YOUR FREE CATALOG OF OUR COMPLETE DUST COLLECTION ACCESSORIES, PLEASE PHONE:

3 inch - $7.95
5 inch - $11.95
4 inch - $9.95
6 inch - $14.95

PolyVent Company 1-800-366-4202
1007 (S) Shary Circle
Concord, CA 94520
FAX: 415-767-1107

BRANDING IRON
Your Satisfaction Guaranteed
• Convenient torch heating
• Solid brass – lasts years
• Special wording available
• Electric Models Start at $49.95
• 2nd line – 20 letters/spaces max.
• 1/4" letters
• Distinctive Border
• Add $2.50 shipping and handling
• OH res. add 0% sales tax

Order by mail from
**BrandMark**
462 Canhage Dr., Dept. W2
Beavercreek, OH 45430
(513) 456-6843

**NEW**
**Blast Gates**
Your Best Price Source

WOODWORKER'S CATALOG
There are over 4,000 money-saving reasons why woodworkers rely on Constantine.

4,000 woodworking items to help you Build-Restore-Repair-Renovate. Over 200 different woods...150 veneers...500 plus...cabinet hardware...96 How-To Books...189 carving tools and dies...76 inlay designs...and lots more for One-Stop, Right-Price Shopping without leaving home!

116 Page Catalog Only $1.00

**CONSTANTINE**
Est. 1812
2054A Eastchester Road, Bronx, NY 10461

For information about placing an advertisement in Better Homes and Gardens® WOOD write:
Bill Reed
WOOD Magazine
750 Third Avenue
New York, NY 10017

Or call collect: 212-551-7130
The Discerning Craftsman

(ADVERTISEMENT)

LUMBER YARD

• Select a wood species that's compatible with the project you're planning to build (there are several good reference books that list various species characteristics and preferred uses).
• If you're planning to build several projects in the near future, consider ordering what you need for all of them at one time. That way, you'll have the stock you need when you're ready to build.
• If you or someone you know has a plane, and if you are willing to surface your own lumber, you can save money by ordering stock that's undressed (rough sawn).

Quality

EXOTIC LUMBER

Figured Domestic
Turning Wood
Exceptional Quality
Personal Friendly Service

Whether you are a Beginner or Professional,
We welcome your inquiries
Call or Write:

#BereaHardWoods Co.
128 Jacqueline Drive • Berea, Ohio 44017
216-943-4432

DOMESTIC & FOREIGN
HARDWOODS

Quality stock for Cabinet Work
Most all sizes from 1½ to 4½ in thickness

HARDWOODS

ASH—BASSWOOD—BIRCH
BUTTERNUT—CHERRY
CHESTNUT—EBONY—MAPLE
OAK—POPLAR—ROSEWOOD
TEAK—WALNUT
Also hardwood plywoods

SOFTWOODS

SUGAR PINE—CYPRESS—CEDAR
SPRUCE—DOUGLAS FIR
et al.
MAURICE L. CONDON CO., INC.
242 Ferris Ave., White Plains, NY 10603
914-946-4111
Monday through Friday 8 AM to 4:30 PM

EST. 1974

NATIVE AMERICAN HARDWOODS

Quality, Service and Price, call or write Ed
Seeley or Tim Johnson, All Domestic
HARDWOODS

Cherry Curley maple
Red Oak Black Walnut
Ash Tulip Poplar
Birch White Oak
Basswood Wormy Red Maple
Butternut Hard Maple
Squares Wide Stock

Send $1 for catalog (refunded with order) to:
NATIVE AMERICAN HARDWOODS, LTD
8370 Gowanda State Road, Hamburg, NY 14075
Phone: 716-648-7851 • 1-800-586-7851
FAX: 716-648-3392

Figure your lumber needs, then add 15% for waste.
As you do this, think in terms of the number of boards of a certain size it will take to yield the parts
for your project. Make a cutting diagram showing how you plan to cut each of the boards.
Send along a copy of the cutting diagram with your order, and explain the type of project you're
planning to build. Both of these things help us in filling your order.
Send for our product brochures, and keep them on file in your shop. That way, when you need a
particular type of stock, you'll have ready reference.

Buying in bulk lowers the cost per board foot.
Consider going together with some of your
woodworking friends, and take advantage of the
savings. Some of us have minimum orders.
Be aware of shipping costs. Is the price quoted a
shipped price? How will it be sent? UPS? Trucking
firm? Etc.? Ask.
Upon receipt of your order, please inspect it and
report any damaged material to the carrier
immediately.

HARDWOOD CATALOGUE

Only $2.00. Refunded
with order.

White oak, cherry, walnut . . . nothing compares in
texture, grain and quality to Appalachian hardwoods.
Order your catalogue today. We offer 21 species
of domestic hardwoods, softwoods and hard-to-find
imports. All wood is kiln-dried and personally
selected. We'll finish at no charge. All prices include
delivery. Write today.

EDLCO

P.O. Box 5373-C, Asheville, N.C. 28813 • 1-704-255-8765
Hardwood specialists since 1952.

STEVE WALL LUMBER CO.

Quality Hardwoods and Woodworking Machinery For
The Craftsmen and Educational Institutions

STEVE H. WALL
LUMBER CO.
BOX 287 • MAYODAN, N.C.
27027
919-427-0637
1-800-633-4062
FAX 919-427-7588

Send $1.00 For Lumber
and Machinery Catalog

STEVE WALL LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEV E WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.

STEVE WALL
LUMBER CO.
POWER TOOLS

SCROLL SAW AND LATHE INFORMATION—More than 20 pages of information, including full-color photos, on HEINBERG scroll saws, HEINGER lathes, and HEIGNER duplicators. Find out why these machines are considered state of the art, and what to look for when shopping for scroll saws or lathes. AMI LTD. $1.00. Circle No. 7.

WOODWORKING PROFESSIONALS ONLY—Now save 50% on machinery, 70% on operating costs! How? By using the new 1/2-inch scroll saw. 3000 superfine shavings. Commercial durability, utmost precision, set-in seconds. No other tool combines usable capabilities like FENDER. Thousands sold. Send today for your free brochure. AMI LTD. $1.00. Circle No. 3.

ACME ELECTRIC IS ANNOUNCING OUR NEW 170-PAGE CATALOG—It features a wide selection of merchandise for your home and office, including electronics, musical instruments, toys, and much more. Send for your copy now. ACME ELECTRIC CO. FREE. Circle No. 5.

FREE WOODWORKING POWER TOOL CATALOG—Buy planers, jointers, shaping tools, saws, bandsaws, drum Sanders, drill presses, wood lathes, Sanders, dust collection systems, and more—direct from the factory and save. Foley-Belsaw sells direct to you, so save on every purchase. You'll find quality power tools, plus hand tools and accessories to meet all of your woodworking requirements. Complete money-back guarantees. Send for details. FOLEY-BELSAW. FREE. Circle No. 2.

MANUFACTURED SINCE 1926—the Foley-Belsaw Model M-14 Circular Sawmill lets you get your tree to the job site in 15 minutes, true-cut lumber. Available with heavy-duty steel base or with a stand and tool for provided owner built wood, wood. Will accurately saw up to 15' in length and 24" in diameter. Complete money-back guarantees. Send for details. FOLEY-BELSAW CO. FREE. Circle No. 42.

INCA MACHINERY INFORMATION—Complete information on the famous line of Inca lumber slicing machines. Designers and manufacturers of industry-proven, high-speed, sawless log slicing available on current promotion. PENN STATE INDUSTRIES. Free. Circle No. 76.

SURFACE PLANE—Information available from Penn State Industries describing the specifications and applications of its super 12-inch surface plane. Special discount pricing for limited time promotion. PENN STATE INDUSTRIES. Free. Circle No. 77.

PERFORMAX DRUM SANDERS—Exclusive features at an affordable price for precise wide surface sanding. The complete line of Performax Drum Sanders, the Pro Max and the new Super Max. New accessories for production-mo. Sanding of pieces as small as 2" long. Send for brochure, PERFORMAX PRODUCTS $1.00. Circle No. 78.

THE PRECISION SCROLL SAW FOR THE ENTIRE FAMILY—The Hawk was designed for beginners and built for expert woodworkers. Learn how to produce creative fretwork projects for fun or to make money. The Hawk meets our exacting standards. Send for your brochure, OVER 300 leaflets available. ROYAL TOOLS, INC. $1.00. Circle No. 79.

HAND TOOLS

QUICK-GRIP, BAR CLAMPS—Revolutionary new tool for one-handed operation. Positive locking action; strong, yet lightweight. Large pads won't mar work. 6"-35". AMERICAN TOOLS CO., INC. $25. Circle No. 105.

RAI-PLANE—Professional edge finishing tools. The RAI-PLANE lets you quickly round over an edge without the time or trouble of routing and sanding. Dual, micro-adjustable cutter provides for a quick, precise rounded edge in just one pass. For more information, L. A. MATHERS CO., INC. FREE. Circle No. 106.

PERSONAL BRANDING IRONS—Brochure describes the finest personal branding irons available. Quick and easy. Made especially for branding wood, they are available with 1, 2, or 3 lines of copy or with your logo. Additional designs and prices also available. NOVA TOOL CO. $1.00. Circle No. 107.

PLANS

OVER 1000 WOODCRAFT PATTERNS—Create gifts, toys, whirligigs, lawn ornaments, folk art, bird houses and feeders, magazine racks, household accessories, plus much more! Simple enough for the beginner, fun and profitable for the pro. Catalog plus sample pattern. ACCEPTS IN PINE $2.00. Circle No. 310.

WOODWORKERS PLANS AND SUPPLIES—Wood projects, plans, and hardware and other supplies offered by Armor Products. Over 100 plans available for making toys, desks, clocks, pool tables, lamps, chests, and other furniture. Movements, dials, molding, ornaments, dollhouse kits, door hanger supplies. Catalog plus sample plans available. ARMOR PROD. $1.00. Circle No. 315.

SALES TESTED DESIGNS—available as plans only, parts kits, or plans and parts kits. Complete stock of plans, tools, and hardware. Hardware and other supplies offered by Armor Products. Over 100 plans available for making toys, desks, clocks, pool tables, lamps, chests, and other furniture. Movements, dials, molding, ornaments, dollhouse kits, door hanger supplies. Catalog plus sample plans available. ARMOR PROD. $1.00. Circle No. 315.

SALES TESTED DESIGNS—available as plans only, parts kits, or plans and parts kits. Complete stock of plans, tools, and hardware. Hardware and other supplies offered by Armor Products. Over 100 plans available for making toys, desks, clocks, pool tables, lamps, chests, and other furniture. Movements, dials, molding, ornaments, dollhouse kits, door hanger supplies. Catalog plus sample plans available. ARMOR PROD. $1.00. Circle No. 315.

SALES TESTED DESIGNS—available as plans only, parts kits, or plans and parts kits. Complete stock of plans, tools, and hardware. Hardware and other supplies offered by Armor Products. Over 100 plans available for making toys, desks, clocks, pool tables, lamps, chests, and other furniture. Movements, dials, molding, ornaments, dollhouse kits, door hanger supplies. Catalog plus sample plans available. ARMOR PROD. $1.00. Circle No. 315.

MINIATURE HORSE-DRIVEN VEHICLES—The model of the Covered Wagon, the Concord Coach and Conestoga Wagon are available in full size 1" scale cutting patterns.PROTO PLANS. Catalog price published for full size. PROTO PLANS. Catalog price published for full size.

FULL SIZE FURNITURE PLANS CATALOG—Illustrations of furniture plans for making furniture of quality and durability found in museums and fine furniture stores. Plans include roll-top desks, armoires, dining tables, chairs, buffets, chests, cabinets, tables, music stands, wardrobes, chests, bookcases, and more. Bill of materials and instructions for complete reproduction. FURNITURE DESIGNS, INC. $3.00. Circle No. 345.

STICKLER FOR DETAILS—At last an exciting new line of realistic wood block models that you can build with your own scrap wood and sawdust and your own easy-to-follow instructions. Highly detailed plans for a 20"x16"-in. dump truck, GATTO PLAN SUPPLY, $8.00. Circle No. 355.

COUNTRY FURNITURE PLANS—Our catalog features more than 34 designs—from a washstand to a roll top desk. Our new plan on finishing and refreshing will show you how to finish projects like the pros. Also included are a variety of other country furniture plans. Catalog price of catalog deductible from first order. HAMMERMARK ASSOCIATES, $1.00. Circle No. 370.

CHRISTIAN SCROLL/BAND SAW PATTERNS—Quality patterns for Christian themes, crosses, religious symbols, church bazaars, witnessing, or just to keep simple enough for the beginner. Challenger for the pro and profitable for the home builder. Catalog, $1.00. Circle No. 389.

WOODWORKING PLANS—Catalog of full-size plans printed on heavy paper for country crafts, country animals, farm windmills, shelves, birdhouses, garden furniture, Dutch windmill, lawn ornaments, old-fashioned lawn furniture, junk objects and much more. WOODWORKING PLANS $1.00 (refunded upon first order). Circle No. 390.

PROJECT PLANS—Over 400 easy-to-build woodworking project plans (100 new for 1990). Nation's leading source for these plans, craft plans, country furniture, etc. Over 3000 hard-to-find specialty items. Send for your big new 22-page catalog. MEISSEN HARDWARE SPECIALTIES. $1.00. Circle No. 401.

BACKYARD STRUCTURES—Contains designs for 21 really different storage sheds, 5 cabanas, 13 animal shelters, 2 barns, 3 garage enclosures, 3 stables, and more. 100 pages in hard copy, in all for which plans can be ordered. Full color. SUN DESIGNS, $11.45. Circle No. 402.

MAKING TIMELESS TOYS IN WOOD—contains 40 heirloom-quality designs, with 25 mini-books in full color, 96 pages. SUN DESIGNS. $111.45. Circle No. 404.

TOTE-ABOUT PLAYHOUSE—Fun and simple for your children, this portable canvas playhouse can be taken indoors or outdoors. Easy to make, full size plans, 1/4" scale. $1.00. Circle No. 405.

STATIONARY ROCKER PLANS—Build a fine and comfortable rocker with our easy to follow plans & patterns and hardware kit. 3 models available. Also sharpening machines, 12" file sharpeners, griddle, grender, griddle-sander.
GENERAL WOODWORKING CATALOGS

ADVANCED WOODWORKING — Specialty products catalog from the exclusive distributors of Hegner & Felder woodworking machinery. Includes complete selection of Hegner & Felder woodworking machinery, includes complete selection of Hegner & Felder woodworking machinery, includes complete selection of Hegner & Felder woodworking machinery, includes complete selection of Hegner & Felder woodworking machinery.

Wood Magazine April 1993
STICKLEY REACHES BACK

Ever since star Barbra Streisand paid $365,000 last year for an oak mission-style sideboard made by Gustav Stickley at the turn of the century, original Stickley furniture has become hot. Now, the line is even being revived.

L. & J. G. Stickley, Inc. of Manlius, New York, has started producing about 40 pieces of furniture in the same simple style that the company’s founder and his brothers designed and marketed at the turn of the century. Because the mission-style pieces abandoned in 1922 were done in quartersawn white oak, that’s what goes into the revival line, too. The company also remains true to the traditional joinery, such as pegged tenons, that made the furniture so durable.

Your parents or grandparents might even have owned some Stickley furniture. If you want to look over the resurrected line, you can obtain a catalog by sending a $5 check or money order to: L. & J. G. Stickley, Inc., Box 480, Manlius, NY 13104.


WAVING FIELDS OF WALNUT

Time was when you could count on an acre of good Iowa farmland to yield maybe 100 bushels or better of corn. But 100 walnut trees? Who’s kidding whom?

For Jack Schultz and Ron Sippel of Effingham, Illinois, planting an Iowa farm to walnut trees isn’t a joke; it’s an investment. Last spring, they planted 132 acres they purchased in Floyd County with 94,000 tree seedlings, mostly walnut. In 60 or 70 years, when the best trees reach maturity, they’ll be worth approximately $6.6 million, if calculated at today’s value of about $500 per tree.

Meanwhile, until harvest, the property can’t be taxed, and the owners get some repayment for the planting through government Conservation Reserve Program (CRP) and cost-share funds. Jack and Ron calculate that their heirs will reap a return that beats many other possible investments. Besides, there’s nothing like watching an investment grow firsthand.

BYE-BYE BUTTERNUT

Butternut (Juglans cinerea), walnut’s cousin and a favorite wood of carvers, could disappear from America’s forests. Richard Smith, a plant pathologist with the U.S. Forest Service in Washington, D.C., reports that a deadly canker fungus threatens it.

“There doesn’t seem to be any resistance to the canker,” he notes. According to Smith, past research proposed crossbreeding butternut with more disease-resistant walnuts. However, no federal money has been allocated to continue the work. Individual trees suffering from the canker benefit from treatment with benomyl, a fungicide.

BARKING TOP TO BOTTOM

During the days when logging was done with animals in the Northwest, logs were debarked in the woods to reduce hauling weight. With a pry-bar called a spud, the top Barker removed all the bark from atop a fallen log that he could reach. Then, it was turned over for the under Barker to work on.

Illustrations: Jim Stevenson
AN ELITE OFFERING

$1799*

5 Hp, 3 Ph
3 Hp, 1 Ph

Once again Powermatic cuts through the hype to the heart of the industry’s best. Unlike the competition, we’ve produced a superior TA Saw and Shaper that stand at the forefront of quality engineering ... an ELITE OFFERING at an exceptional price.

Our 66 TA Saw is built to last — with a heavier mechanical design, one-piece cast iron “box” trunnion and a larger work surface than the competition. With a STANDARD C-Face motor design, Biesemeyer T-Square Fence System†, and the ability to cut to the center of a 4’ x 8’ panel from either direction, it is certain to outperform any on the market.

Our 26 Shaper’s time-proven dovetail design and large widely spaced bearings, fully adjustable fence, and easily accessible reversing switch (3 and 5 HP models) provide the muscle and precision necessary to produce the BEST with today’s discriminating consumer.

And far more than excellent pricing, you’ll get the ELITE Powermatic quality you’ve come to expect, and resale values that can’t be matched. Call us now for an exceptional value you can’t afford to miss ... and the name of your nearest participating Powermatic distributor.

1-800-248-0144

Better By Design®
POWERMATIC®

A Division of Stanwich Industries, Inc. McMinnville, Tennessee 37110
800/248-0144 615/473-5551 TELEX 554455 FAX # 615/473-7819

$1650*

5 Hp, 3 Ph
3 Hp, 1 Ph

<table>
<thead>
<tr>
<th>66 TA Saws</th>
<th>26 Shapers</th>
</tr>
</thead>
<tbody>
<tr>
<td>5 HP - 1 Ph $1897*</td>
<td>5 HP - 1 Ph $1755*</td>
</tr>
<tr>
<td>2 HP - 1 Ph $1628*</td>
<td>2 HP - 3 Ph $1560*</td>
</tr>
<tr>
<td>2 HP - 3 Ph $1675*</td>
<td>2 HP - 1 Ph $1560*</td>
</tr>
</tbody>
</table>

*Suggested consumer price
†VEGA Industrial Fence System standard on 2 HP Model 66
Now there's a paint and varnish remover that doesn't require protective clothing: Safest Stripper® Paint and Varnish remover from 3M. It's easy. It's effective. And, because it contains no methylene chloride, it has no unpleasant odors, no harmful fumes and it won't harm wood or skin. Just apply a thick coat and let it sit to fully soften the old finish. It won't lose its effectiveness, even after sitting all night. So you can complete the entire project at once. It's part of the wood refinishing system from 3M.

With a fresh new approach to refinishing, ask for the system wherever you find wood refinishing products. Because when it comes to refinishing, 3M has you covered.