
The Woodworker's Journal

Vol. 8, No. 3

May/June 1984

\$2.50



Included in this issue: Country Vegetable Bin • Oak and Glass End Table
Carved Hand Mirror • Wall Hung Display Cabinets • Paper Towel Holder
Toy Car and Trailer • Writing Desk • Folding Deck Chair • Laminated Clock
Wooden Coat Hanger • Carved Walking Stick • Shaker Pedestal Table

BACK ISSUES



Vol. 4 No. 4 July-Aug '80: Magazine Rack, Gothic Oak Stool, Whale Cribbage Board, Doll Cradle, Nut & Bolt Toy, Basket-weave Planters, Easy Wall Clock, Router Bit Box, Pine Cellarette, Lap Chessboard, Pine Wall Box.

Vol. 4 No. 5 Sept-Oct '80: Cabinetmaker's Workbench, Cobbler's Bench Coffee Table, 19th Cent. Cherry Table, Kitchen Utensils, Book Rack, Nuts & Bolts, Nutcracker, Walnut & Glass Bank, Schoolhouse Desk, Booster Seat.

Vol. 4 No. 6 Nov-Dec '80: 17th Cent. Mantle Clock, Toy Truck, Bud Vase, Grain Scoop, Letter Rack, Phone Memo Caddy, Toy Circus Wagons, Animal Puzzles, Library Stool, Quilt Rack, Ratchet Table/18th Cent. Trestle Table, Lathe Steady Rest.

Vol. 5 No. 1 Jan-Feb '81: 18th Cent. Wall Shelves, Hand Mirror, Cutting Boards, Tic-Tac-Toe Game, 18th Cent. Vanity, Shaker Pine Cupboard, Tenon Jig, Towel Ring, Matchbox, Corner Shelves, Contemporary Cabinet, Black Forest Clock, Shop Drawing Board.

Vol. 5 No. 2 Mar-Apr '81: Child's Rocker, Bandsaw Jig, Push-Pull Toy, Half-Round Table, Spoon Rack, Salt and Pepper Shakers, Calculator Stand, Anchor Thermometer, Plant Stand, Oak Writing Desk, 18th Cent. Chair Table, Shop-Built Handscrew.

Vol. 5 No. 3 May-June '81: 18th Cent. Sleigh Seat, Child's Step Stool, Kiddie Gym, Flying Duck, Dominoes, Trouser Hanger, Mug Rack, Folding Sun Seat, Ship's Wheel Table, Contemporary Buffet.

Vol. 5 No. 4 July-Aug '81: Longhorn Steer, Bike Rack, Miniature Chest, Doll House Bed, Curio Shelves, Belt Rack, Rocker Footrest, Early American Wall Shelf, Multipurpose Cabinet, Box Cutting Jig, Dish Rack.

Vol. 5 No. 5 Sept-Oct '81: 18th Cent. Rudder Table, Musical Jewelry Box, Colonial Candlestick, Deacon's Wall Shelf, Toy Hippo, Spalted Boxes, Woodbox, Sewing Cabinet with Tambour Doors, 18th Cent. Tavern Table, Router Jig for Stopped Dadoes.

Vol. 5 No. 6 Nov-Dec '81: Old-Time Ice Box, Victorian Sled, Tile Clock, Wine Glass Holder, Mahogany Wall Shelf, Inkwell, Bagel Slicer, Seal Push Toy, Wooden Combs, Antique Knife Tray,

Memo Cube, Fireplace Bellows, Contemporary Shelving, Weather Station, Shop-Built Bar Clamp.

Vol. 6 No. 1 Jan-Feb '82: Contemporary Sofa Table, Artist's Easel, Candle Box, Laminated Box, Butcher Block Knife Rack, Frog Pull Toy, Infinity Mirror, Japanese Style Table Lamp, Empire Footstool, Desk Caddy, Stepped-Back Hutch, Buckboard Seat, Lattice-work Cutting Jig.

Vol. 6 No. 2 Mar-Apr '82: Early American Blanket Chest, 18th Cent. Corner Shelf, Pine Footstool, Cheese Cutting Board, Napkin Holder, Trivets, Coaster Set, Pierced Tin Cabinet, Hutch Clock, Oak File Cabinet, Mahogany Tripod Table, Wall Hung Plant Bracket.

Vol. 6 No. 3 May-June '82: Country Kitchen Cabinet, Rough-Sawn Cedar Clock, Swinging Cradle, Toy Helicopter, Casserole Dish Holder, Ship's Wheel Weather Station, Octagonal Planter, Tambour Desk, Band Saw Boxes, 19th Cent. Step-Chair, Sailing Ship Weather Vane.

Vol. 6 No. 4 July-August '82: Dovetailed Footstool, Toy Chest, Plant Stand, 18th Cent. Lawyer's Case, Frame and Panel Joint with Decorative Bevel, Collector's Plate Frame, Toy Jeep, Trestle Table and Bench, 19th Cent. Danish Washstand, Contemporary Wall Valet.

Vol. 6 No. 5 Sept-Oct '82: Early American Hanging Corner Cupboard, Breakfast Serving Tray, Veneered End Table, Chess Table, Chest of Drawers, Contemporary Writing Desk, Whale Toy, Laminated Shoehorn, Spaghetti Measure, Candle Holder, Horizontal Boring Jig, Cane Suppliers, Finishing Suppliers.

Vol. 6 No. 6 Nov-Dec '82: Lyre Clock, Geodesic Lighting Fixture, Sawhorse Dining Table, Oak Desk Clock, Shaker Wall Shelves, Old-Time Radio Case, Cider Press Lamp, Contemporary Hanging Light Fixture, Firewood Rack, Toy Tool Box, Christmas Tree Ornaments, Willie and Tuna Push Toy, Woodpile Trivet, Circle Cutting Jig, General Woodworking Suppliers.

Vol. 7 No. 1 Jan-Feb '83: Workshop Tote Box, Tinsel-Art Mirror, European Spinning Wheel, Key Holder, Dump Truck Toy, Bang-a-Peg Toy, Puzzle, Wall Cabinet with Reverse Glass Stencil, End

Grain Table Lamp, Butler's Tray Table, Contemporary Clock, Pine Cabinet.

Vol. 7 No. 2 Mar-Apr '83: Porch Swing, Homemade Jig Saw, Cheval Mirror, Punched Tin Spice Cabinet, Television Stand, Nautical Table Lamp, Wooden Balance, Nesting Cube Tables, Steam Roller Toy, Back Massager, Mailbox, Wall Shelf, Chippendale Mirror, Clock Parts and Suppliers.

Vol. 7 No. 3 May-June '83: Oak Pedestal Table, Drafting Table, Early American Wall Unit, Folding Snack Table, Pine Corner Cupboard, Toy Car with Boat & Trailer, Letter Opener, Contemporary Serving Tray, Hanging Mirror with Shelf, Carved Eagle, Early American Portable Bookcase, Hardwood Suppliers.

Vol. 7 No. 4 July-August '83: Turned Lamp, Decoy Carving, Antique Sugar Chest, Record Album & Tape Cabinet, Chinese Tea Table, Old-World Weather Forecaster, Toy Tractor & Cart, Display Pedestal, Two Planter Projects, Collector's Plate Stand, Hardware Suppliers.

Vol. 7 No. 5 Sept-Oct '83: Shaker Writing Desk, Modelmaker's Bench, Canning Jar Storage Shelves, Turned Bowl, Oriental Table, Router Table, Band Saw Box, Toy Pumper Firetruck, Toy Airplane, Spoon Rack, Magazine Rack, Bootjack, Furniture Kit Suppliers.

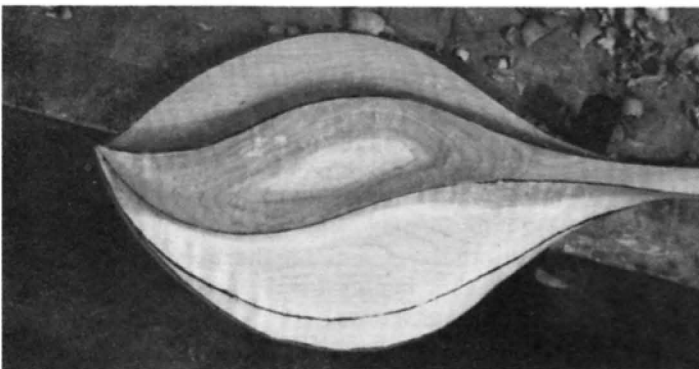
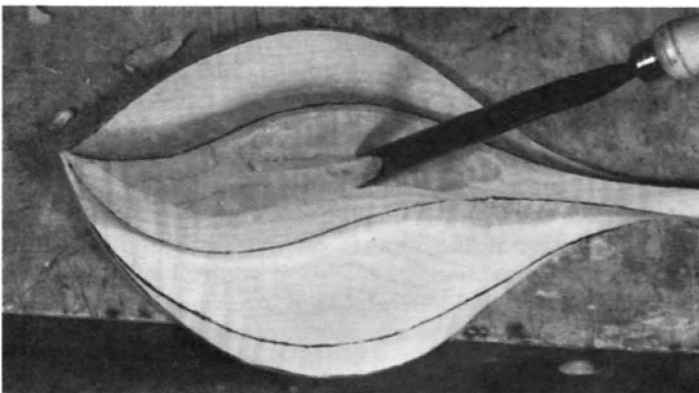
Vol. 7 No. 6 Nov-Dec '83: Lighted Wall Planter, Roller Stand, Early American Wall Secretary, Dressing Screen, Wine Rack, Shaker Chest of Drawers, Waterbed, Toy Train, Mitten Box, Hooded Doll Cradle, Coal Scuttle, Elephant Push Toy.

Vol. 8 No. 1 Jan-Feb '84: Shaker End Table, Medicine Cabinet, Cassette Tape Rack, Captain's Clock, Stacking Storage Unit, Veneer Bracelets, Toy Car Carrier, Infant Bead Toy, French Bread Cutter, 19th Cent. Kitchen Clock, Early American Trestle Table & Benches, Table Saw Cut-Off Table, Coaster Set, General Woodworking Suppliers.

Vol. 8 No. 2 Mar-Apr '84: Shaker Wall Clock, Compact Dry Bar, High Chair, Kitchen Canister Set, Colonial Water Bench, Stacking Desk Trays, Wooden Brooches, Toy Bulldozer, Rocking Horse, Contemporary Table, Wall Hung Telephone Cabinet, Pipe Smoker's Organizer, Clock Parts Suppliers.

Please Note

....supplies are limited! Vol. 4 No. 4 is printed in tabloid format and the price is \$1.50 each. Vol. 4 No. 5 and all succeeding issues are printed in magazine format and the price is \$2.50 each. Conn. residents, please add 7½% sales tax. Some back issues are shipped U.P.S. so please include street address, not P.O. Box number.



Photos by Glenn E. Firmender

Carving a hand mirror. See page 39.

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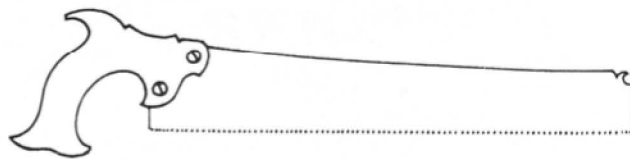
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Contributions

We welcome contributions in the form of manuscripts, drawings and photographs and will be glad to consider such for possible publication. Contributors should include a stamped, self-addressed envelope of suitable size with each submission. While we cannot assume responsibility for loss or damage, all materials will be treated with care while in our possession. Payment for the use of unsolicited material will be made upon acceptance. Address all contributions to: Editor, **The Woodworker's Journal**, P.O. Box 1629, New Milford, CT 06776.



The Woodworker's Journal

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Shoptalk

Old Tools

For me, there has always been a special satisfaction in working wood with hand tools, and that satisfaction is enhanced when I can use an old tool that has been restored to good working condition. Although I don't consider myself a serious collector of antique tools, I do enjoy poking around at tag sales and flea markets, and over the years have managed to acquire a modest collection consisting mostly of wooden molding and jack planes, chisels, gouges and various marking gauges. Most of these tools were very low in price (under \$10), and required little restoration; perhaps a linseed oil soak, rust removal and regrounding and sharpening of cutting edges.

I don't really believe that my old wooden jack planes do a better job than the modern steel versions; actually, most of them require a lot more fussing to adjust the depth of cut, but they feel good and look good (some are displayed in my living room when not in use), and in a small way help to make my hours in the shop more enjoyable.

Collecting antique tools can be a very rewarding spin-off from your woodworking hobby. In the April issue of *Yankee* magazine, there was an interesting article on antique tool collecting. I wasn't surprised to find that avid collectors travel from all over the country to attend tool auctions in New England, and sometimes pay thousands of dollars for one tool.

Interest in collecting antique tools has been a fairly recent development over the last 10 or 15 years and prob-

ably coincides with the increased interest in woodworking. As more people become aware of the intrinsic value and beauty of old tools, it would seem that the days of buying a bushel basketful for a few bucks are coming to an end, but there are still a great many of them "out there" in attics and barns, just waiting to be cleaned up and used again.

Collections arranged in display cases are fine but I think it's even better if the objects of your affection can be actually put to good use. Of course, if you're lucky enough to stumble upon that one-of-a-kind rosewood, brass and ivory plow plane that's worth \$6000. at auction, I wouldn't blame you for mounting it over the mantelpiece alongside that 26 inch brown trout that you caught off guard in 1962.

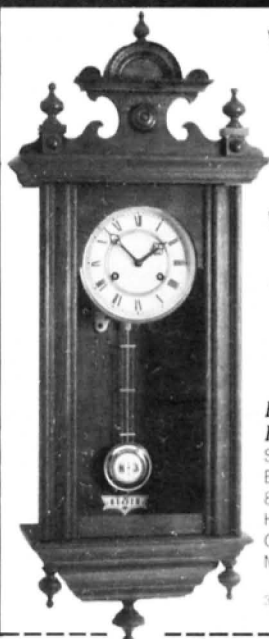
New Tools

If you're not turned on by old tools, perhaps you've gotten excited over some of the new screwdrivers that have been coming on the market in recent years. One version by Stanley® features five snap-on interchangeable bits that are stored in a hollow handle. It's one of those neat, practical ideas that makes us wonder why it wasn't thought of earlier. There are other versions on the market, and the type with a large ratchet handle helps ease the job when you've got to drive a lot of screws.

There's one problem I've had with interchangeable bits, especially if they are magnetic and don't fit snugly in the handle tube. Sometimes, instead of pulling loose from the tightened screw head, they pull from the screwdriver tube. Because of this, I lost two bits overboard when tightening stanchions on a boat. This is no problem if you have a screwdriver for which replacement bits can be bought.

Jim McQuillan

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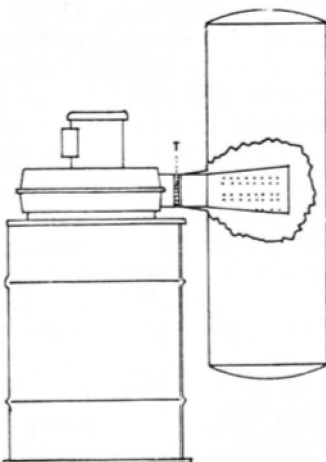
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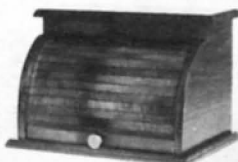
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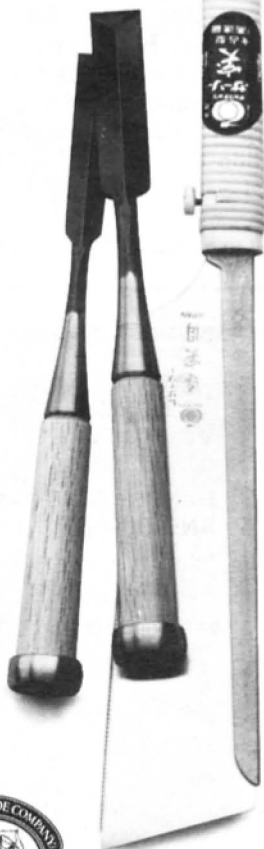


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Letters, (Cont'd)

914-271-3101. Send a self addressed stamped envelope with four slides of work plus one of your display to Monya Brown, 33 Lexington Drive, Croton-On-Hudson, NY 10520.

A summer workshop entitled "Equipment Maintenance and Repair" will be offered by the School of Technology at Bowling Green State University and Ornamental Products Tool & Supply Company. The six day workshop, which may be taken for non-credit or for 2 semester hours of undergraduate or graduate credit, is scheduled for June 18-23, 1984. Meeting hours for the workshop to be held in Cleveland, Ohio, will be 8:00 a.m. to 5:20 p.m. daily.

The purpose of the workshop is to familiarize the participants with setting up, adjusting, maintaining, repairing and overhauling common woodworking and metalworking machinery. Demonstrations by field service staff and intensive "hands-on" activity will highlight the week as numerous machines are explored.

For information or registration materials contact Dr. Richard A. Kruppa, School of Technology, Bowling Green State University, Bowling Green, OH 43403. Phone (419) 372-2436.

We're pleased to announce the Eighth National Woodcarving Show sponsored by the Eastern Oklahoma Woodcarvers Association. It will be held on July 27-29, 1984. There will be at least eighty woodcarvers from Oklahoma and surrounding states displaying their art.

For information contact Ted Cummings (Show Chairman), P.O. Box 103, Kellyville, OK 74039, (918) 247-6654; or Robert Hughes (Publicity), 2204 S. 132nd East Ave., Tulsa, OK 74134, (918) 437-1474.

Editor's Note: Reader requests for information keep coming in. Here are a few more.

Can any of your readers supply me with the name of a company that makes old-fashioned spoke-hub type wheels (10 in. to 14 in. diameter) that were made for toy farm wagons and

stagecoaches? I would prefer them made out of oak. Any information you can furnish will be greatly appreciated.

C. A. Watts
4126 Faulkner Place
Charlotte, NC 28211

I need some help locating an owner's manual and/or parts list for a Sears (Dunlap) Jig Saw, model number 103-0403. Naturally, I will pay for any photocopying and mailing costs associated with the delivery of this information.

George S. Malindzak, Jr.
183 N. Prospect St.
Kent, OH 44240

I'm trying to find 2 — 2½ in. diameter rubber wheels and 4 — 6 in. diameter plastic wheels. I'm looking for the kind used on lawn trimmers, white with a black tire.

J. A. Junge
6915 Farrow
San Antonio, TX 78240

I am in search of an armature shorting device for a motor on my old Delta Unisaw. I wonder if any of your readers might have a scrap motor around or know where I might obtain a new armature device. I'd also like to get a 5 or 5½ in. three-V motor pulley for this machine. The motor tag reads: Delta Mfg. Co., Model 8300, 1725 RPM 1hp, Frame 1R80 CU, Style 235 32, Volts 115/230, Amp 12/6, Single phase.

Joseph W. Law
P.O. Box 305
Leslie, GA 31764

I would like to hear from any readers who may have the manual and replacement parts list for a Craftsman 18 in. jig saw, model number 103.23151. I will reimburse you for any expenses incurred in making copies, plus postage.

Alex W. Flinsch
28 Willard St.
Garfield, NJ 07026

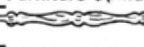
I have recently purchased a Sears radial-arm saw (9 in.), model number 113.29350. I am willing to pay for a copy of the operator's manual.

C. C. Cornell
193 Fairlawn Dr.
Columbus, OH 43214

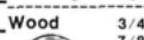
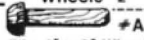
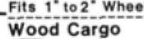
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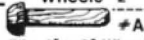
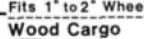
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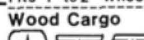
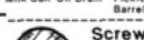
-  Birch Mug Peg \$.37-42 ea. \$.22/ea.
-  Birch Shaker Peg \$.42-44 ea. \$.25/ea.
-  Oak Shaker Peg \$.44-46 ea. \$.26/ea.

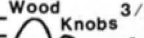
-  Birch Furniture Spindles 6 inch \$.70-72 ea. \$.42/ea.
-  8 1/2 inch \$.85-87 ea. \$.51/ea.

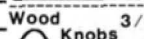
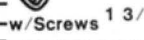
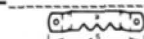
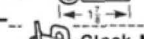
-  2 inch #S4 Galley Spindle \$2.50-10 \$1.50/10

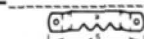
-  Wood 3/4" \$5.95/C \$3.57/C
-  7/8" \$7.95/C \$4.77/C
-  1" \$8.33/C \$5.00/C
-  1 1/4" \$13.95/C \$8.01/C
-  1 1/2" \$18.25/C \$11.01/C
-  2" \$30.00/C \$18.00/C

-  #AP1 Axle Peg
-  Fits 1" to 2" Wheel \$6.95/C \$4.17/C

-  Wood Cargo
-  Oil Drum \$3.85/10 \$2.31/10
-  Milk Can \$3.60/10 \$1.80/10
-  Pickle Barrel \$3.65/10 \$2.31/10

-  Screw Hole Buttons
-  3/8" \$2.90/C \$1.74/C
-  1/2" \$2.95/C \$1.77/C
-  Dowel Pins 3/8"x2" \$2.95/C \$1.77/C

-  Wood Knobs 3/4" \$1.50/10 \$0.90/10
-  1" \$2.95/C \$7.77/C
-  1 1/4" \$2.40/10 \$1.40/10
-  1 1/2" \$2.40/C \$1.24/C
-  1 3/4" \$2.50/10 \$1.50/10
-  w/Screws 1 3/4" \$23.90/C \$13.80/C
-  1 3/4" \$3.70/10 \$2.20/10
-  1 3/4" \$3.65/C \$20.79/C

-  Saw Tooth Hangers
-  \$6.95/C \$4.75/C

-  Picture Hanger
-  \$7.95/C \$4.17/C

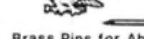
-  Clock Movements w/Hands
-  Q72 \$10.80/ea. \$6.48/ea.
-  \$49.50/5 \$29.70/5

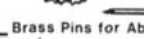
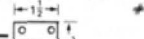
-  Lazy Susan Bearing
-  3" \$1.15/ea. \$.69/ea.
-  4" \$1.60/ea. \$.96/ea.
-  6" \$2.80/ea. \$1.73/ea.

-  Brass Plated Candle Cup
-  \$5.00/10 \$3.00/10
-  \$49.00/C \$29.40/C
-  Coat and Hat Hook
-  \$2.79/ea. \$1.67/ea.

-  Brass Wreath
-  \$8.50/10 \$5.10/10

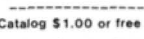
-  Brass Anchor
-  \$5.90/10 \$3.30/10

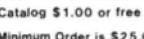
-  Brass Plt. Eagle
-  #878 \$3.60/10 \$2.16/10

-  Escutcheon Pins
-  Brass Pins for Above \$.95/C \$.57/C

-  #928 Butt Hinge
-  \$2.80/10 \$1.68/10

-  #F124 Screw for Above
-  \$4.00/C \$2.40/C

-  Clipboard Clips
-  3" \$.59/ea. \$.35/ea.
-  6" \$.99/ea. \$.59/ea.

-  Plastic Shelf Pins
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Note: C = 100

☐ Catalog \$1.00 or free with order Total Order

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and they're yours for an incredible \$9.95

It's a 14 piece set. 7 professional quality
drill bits and 7 matching stop collars.
Advertised up to \$17.95

You won't find these in hardware stores. These are *brad point* wood drill bits. With brad points, you make the holes exactly where you want with no "jumping" or "walking". Each bit has two cutting spurs with extremely sharp flutes. You get router clean holes every time with none of the splintering that happens with ordinary metal drill bits.

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YES, please send me your 14 piece wood drill bit and stop collar set. If I'm not perfectly satisfied, I understand I can get a complete refund by returning my order within thirty days.

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Signature _____ please print

Account No. _____ Exp. Date _____

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Danbury, CT 06810
Dept.

Name _____

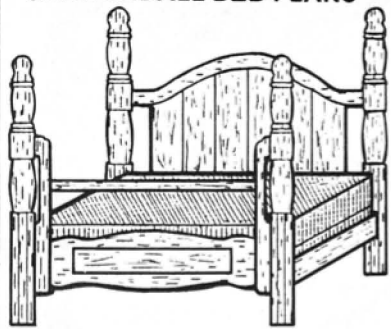
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WJ 54

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Complete plans with detailed procedures and material list. Original made of oak but pine or any other wood will provide a sturdy, beautiful bed. Plans are adaptable to double, queen, or kingsize mattress and box springs. 60 inches high. Simple enough for the beginner yet challenging enough for the intermediate and advanced woodworker.

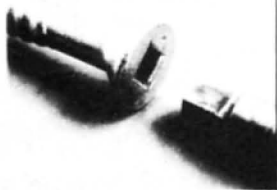
Send check or money order for \$10.00 to:

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Toledo, OH 43612

Enclosed is \$10.00. Please send one set of CANNONBALL BED PLANS to:

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Address _____
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Workshop Income

Mail-Order Selling

How I Made A Fortune In Mail Order Sales. New Book Tells How. Send Order Now!

In one form or another we've all seen this magazine ad, and the message is always the same; order my book and you'll know the secrets of mail-order selling—and become wealthy. It sounds so easy, one can't help but wonder why the author bothered to waste time writing a book when those "secrets" could have been used to turn another quick million.

Of course, the truth is that there are no "secrets" that will guarantee mail-order success. After all, if it just took a short book and a few "secrets", we'd all be wealthy in no time. Making money at mail-order selling is difficult, but that's not to say it can't be done. Many people are quite successful at it. In fact, some individuals have made fortunes, just like the ad says, although we suspect that for every millionaire there are probably a hundred who have lost their shirts.

In its basic form, the idea of selling mail order sounds simple enough. You select a suitable product and advertise it in a magazine. The orders come in and you ship the product to the customer.

As you might expect though, it isn't quite that easy. For successful mail-order sales, four important criteria must be met: 1. The product must have appeal; 2. The product must have an attractive price; 3. The ad must be effective; 4. The magazine you advertise in must have the right type of readership for the product your selling.

What is a good mail order product for a woodworker? Unfortunately we don't know. If we did we'd be selling it right now and making our fortune. Although we can't suggest specific products, we can tell you one important quality that's common among most successful mail-order items. In almost all cases the product is one that is unique. That means you can't buy it at the local drug store, or the hardware store, or the furniture dealer down the street. If someone wants it they have to order it from you.

Of course, the mere fact that an item is unique does not insure its success. A two legged chair might be a unique product, but nobody is going to want one. So in addition to uniqueness, the item must also be one that people will want. Offer a unique product that will appeal to a great many people and you are well on your way to a successful mail order business.

Once you've decided on a product that you think will sell, you'll need to establish a selling price. Of course, price is related to cost, and cost is related to how fast you can make the product, along with overhead, raw material costs, and shipping costs. Work out your selling price with care. If it's too high the product may not sell, no matter how appealing it may be. On the other hand, if the price is too low, you may be losing money on each sale.

Also, this is a good time to consider if your production schedule can keep up with the anticipated orders. The law says that any item sold via mail order must be delivered within 30 days. If it can't be delivered within that time, you must tell the buyer when delivery can be expected. You must also give the buyer an opportunity to cancel at that time. We don't need to tell you the difficulties you'll have if

you receive 100 orders over a one week period, and at your maximum production you can only make five per week.

You can have a great product at a great price, but if your magazine ad is lousy, the product won't sell. There just isn't room in this column to talk about the specifics of good ad design, although we can point out some important considerations. First of all, your ad should catch the readers eye, no easy task when you consider a magazine may have hundreds of ads. You will also need to show the reader what your product looks like, so you'll need a good quality photograph or a professional looking rendering. The copy should clearly explain what the product is, its overall dimensions, the type of wood used, and any features that you feel would help sell it.

For more information on designing an ad, check your local library as there are a number of good books available. If you feel you need professional help, get in touch with an advertising agency.

Choosing the magazine (or magazines) you will advertise in is another important consideration. Many fall into the category of special interest magazines because they appeal to readers with like interests. For example, readers of Gourmet magazine like to cook, while those of Hot Rod magazine are interested in cars. Ideally, you want to advertise in magazines that have a readership that is most likely to be interested in your product. So if you're selling a set of hardwood cooking utensils, your ad might be successful in Gourmet. But the same ad in Hot Rod would probably do poorly.

How much will a magazine ad cost you? That depends on the size of your ad and the magazine you choose to run it in. Generally speaking, a magazine's ad rate is related to its circulation (number of subscribers). The bigger the circulation, the more you pay.

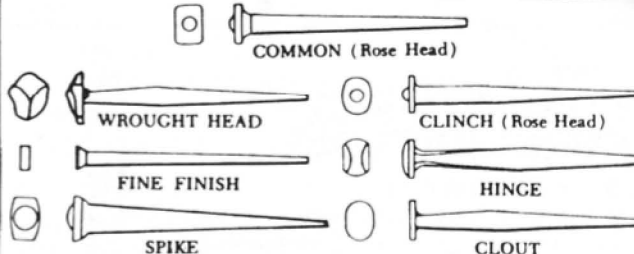
Let's say you're ad measures two columns wide by 3 in. high (that's called a six column inch ad) and you are going to place it in a magazine with a circulation of 300,000. A rate of \$240 per column inch is a good average for a magazine of that size so we'll use that figure. At that rate your ad will cost \$240 x 6 in. or \$1440. That's for a one time insertion. Magazines with circulation of around one million may cost \$400 per column inch, or \$2400 for a 6 inch ad. For specific ad rate information, write to the magazine's advertising department and ask for a media kit.

Unfortunately there is no way to know just how well an ad will do, and few of us can afford to risk several hundred bucks on an unknown venture. If you're convinced you have a terrific product and a great ad, it's best to test the ad in a magazine with a small circulation and a correspondingly low ad rate. If it does well in a 50,000 circulation magazine, it stands to do well in a 500,000 circulation magazine that has a similar readership.

Before running an ad though, you can sometimes get a feel for how you might do by studying the ads for handcrafted wooden items in the various magazines that generally feature such ads. Note the ads that are repeated month after month—that's an indication that they are making money. If an ad runs only once, you can assume it did not do well.

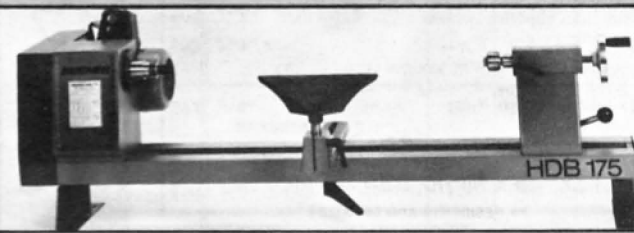
In a short column like this, we've only been able to cover the highlights of mail-order selling. If you want to seriously consider this marketing approach, we suggest you make a point to read more about it. Your library will probably have at least one book on the subject. A particularly good one is titled *More Than You Ever Wanted To Know About Mail Order Advertising* by Herschell Gordon Lewis, Prentice-Hall, Inc.

W&J



Old Fashioned Cut Nails. The Tremont Nail Co. makes 20 varieties of cut nails using the old patterns, including rosehead, oval bung, and wrought-head. Sample kit containing one of each of the 20 patterns, a history of nails in America, and a price list is \$3.75 ppd. Tremont Nail Co., Dept. WJ54, Box 111, Wareham, MA 02571.

NEW HEGNER HDB 175 Lathe



36" bench-mounted lathe with outboard capacity—under \$1000.00! Also ask for our free brochures on **HEGNER** duplicators, and on **HEGNER Universal Precision Saws**, the world's best precision scroll saws.

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Incl. Case, Batteries, and Pins for 3/16" and 7/16" Measuring Depth. Size: 1" x 2 1/4" x 5 1/2"

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Exceptional Wear Resistance.**

Cobalt alloys are a new advancement for the woodworking industry. Tremendous heat dissipation and high temperature stability (in excess of 1000°F — well beyond the range of temperatures encountered in woodworking applications) insures extended life to the sharpened edge which requires less frequent grinding and honing.

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Square nose roughing gouges come factory ground and honed, ready for use, and are available in two sizes:

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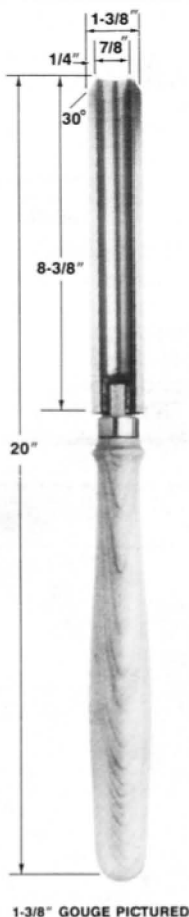
1-3/8" OD X 7/8" ID \$34.50 PPD.

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- Detailed instructions, photos and exploded views.
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— The Woodworker's Journal —

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Enclosed is \$2.50. Please send me your Sept/Oct 1983 issue which contains the Modelmaker's Workbench plans.

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Restoring Antiques

by John W. Olson

Stripping Old Finishes

Faced with the choice of stripping four coats of paint from an old chair, or simply adding a new coat to spruce it up, a surprising number of normally ambitious individuals will opt for the easy way out and slap on the paint. For most of us, stripping furniture just isn't much fun so, as the years go by, old furniture accumulates finishes like a tree adds growth rings. Paint, varnish, shellac and an assortment of other finishes are regularly added until it seems that the finish outweighs the wood.

However, sooner or later the day of reckoning will come. And on that day you'll have to face up to the fact that all those old coats of finish must be removed if the piece is to ever look good again. Although it may not be a day you'll look forward to, it is my hope that some of the information I'm offering here will make the job a little easier. Maybe even a little enjoyable.

The first thing you'll want to do is remove anything that's easily removable. Take off doors, drawers, and hardware. If the top or legs are bolted in place, take them off, too. All these parts can be stripped separately, making the overall job easier.

The next thing you'll want to do is choose your job site carefully. It must be well-ventilated and have no open flame of any kind nearby. Don't work near a gas water heater or a stove with a gas pilot light and, of course, don't smoke. Most paint removers have a high percentage of very volatile, highly flammable ingredients which give off fumes that burst into flame with the greatest of ease. For your own protection use long-sleeved clothing, a respirator designed to remove hydrocarbon fumes, rubber gloves and a face mask. Paint removers are all highly caustic and can easily burn you.

There are two basic methods of removing paint and varnish: chemical and mechanical. Sanding, heating, and scraping—which fall into the category of mechanical methods—are not suitable for use in stripping furniture. Sandpaper removes and destroys the patina of age along with the finish. It also removes a thin layer of wood no matter how carefully you sand. This action changes the color of the top layer of wood, leaving a blotchy appearance that leads to more sanding until only bare wood is showing.

There are several varieties of mechanical removers that use heat to soften the finish which is then scraped off. Some use a hot platen that is a combination scraper and heater. Others use super-heated air to soften the finish which is then removed with a scraper. However, none seem to do a satisfactory job. Generally, the wood surface is not adequately cleaned, and to do a good job you need a clean surface. In addition, several of these devices are actually dangerous as they can set fire to flammable finishes if the heat is applied for too long. This is especially true of those that use open flame, such as the old-fashioned alcohol and

gasoline torches and the modern propane torches. I would not recommend their use on furniture at all. Some manufacturers claim their tools are safe for use on wooden buildings, but it appears the safety factor is dependent on the operator.

The chemical removers attack the old finish and turn it into a thick, viscous, gooey mess that can be used to color all surfaces evenly as it is scraped and wiped off. They come in a wide range of types and prices. Some manufacturers designate their products as "clean up" or "no clean up". The former are generally a lot less expensive but require more care and work. They contain highly volatile hydrocarbons which give off toxic fumes. These chemicals, along with wax, are the basis for most of the formulas. The wax increases the viscosity so that the remover will adhere to vertical surfaces but, as the finish softens, it becomes more liquid and tends to sag and run. These types require clean up with turpentine, mineral spirits or lacquer thinner. One of the best clean up solutions is a mixture of alcohol and lacquer thinner. About half-and-half, but a little heavy on the lacquer thinner will make the solution work better. This mixture also makes a very efficient paint remover when used on certain types of finishes.

Read the manufacturer's instructions carefully and follow them closely for a successful job. Most manufacturers recommend applying the paint remover with a brush and just slopping it on, the more the better. At this point you must be prepared for a really messy, sloppy, gooey job. I cover the floor with a plastic sheet and then use several layers of newspaper over the plastic. When you're finished, you can roll up the newspaper and throw the whole mess in the garbage. The first rule is to apply plenty of remover. The second is to leave it on long enough—generally, twenty minutes to a half hour. At the end of this time, you can test with a stick or with your finger inside a rubber glove. Apply gentle pressure. If your finger goes through to bare wood, you are ready to scrape; if not, apply more remover to any dry looking spots and leave for another twenty minutes. If you feel the need to do something at the end of the first twenty minutes, you can scrape off the softened finish and apply another coat of remover. Either approach works, but the latter is easier from my point of view. When the finish has been scraped, hosed and rubbed down with steel wool, you should be down to bare wood.

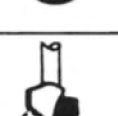
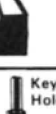
There are always some spots remaining that didn't come clean, as well as the old finish that is still in the cracks and crevices of decorative moldings and carvings and inside corners and cracks. The mixture of alcohol and lacquer thinner mentioned above is an excellent clean up solution and can be applied with rags or steel wool.

Small delicate carvings and the like can be cleaned using a sharpened pine stick. I don't advise using a metal prick for this work as it is all too easy to scratch and otherwise disfigure a delicate molding or carving. Corners, cracks and crevices can be cleaned with stiff-bristled brushes. However, do not use a brush that has a plastic bristle or back. The solution of alcohol and lacquer thinner along with the paint remover will "melt" the plastic down into an unrecognizable mess. Try to locate brass bristle brushes with wooden backs. They aren't easy to find anymore, but a patient search may reveal a source. One mail order source is the Brookstone Co., 127 Vose Farm Rd., Peterborough, NH 03548.

Next issue, I'll tell you how to make your own paint remover. I'll also give you some finishing hints.

Wwj

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	#03	1/2" R	1/2"	1 1/2"	5/8"	15.00
	#04	ROUND OVER 1/4" R	1/4"	1"	1/2"	15.00
	#05	3/8" R	3/8"	1 1/4"	5/8"	16.00
	#06	1/2" R	1/2"	1 1/2"	3/4"	19.00
	#07	ROMAN OGEE 5/32" R	5/32"	1 1/4"	15/32"	18.00
	#08	1/4" R	1/4"	1 1/2"	3/4"	20.00
	#11	3/8" RABBETING	Deep 3/8"	1 1/4"	1/2"	14.00
	#09	1/8" (KERF) SLOT CUTTER		1 1/4"	1/8"	14.00
	#10	1/4" (KERF) SLOT CUTTER		1 1/4"	1/4"	14.00
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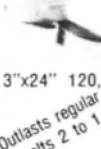
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3"x24"	120,100	1.20 ea
	80	1.22 ea
	60	1.26 ea
	50	1.31 ea
	40	1.34 ea
4"x24"	120,100	1.68 ea
	80	1.73 ea
	60	1.78 ea
	50	1.85 ea
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The Beginning Woodworker

How to Lay Out and Make Circular and Curved Cuts

While a good deal of woodworking involves straight lines and right angles, there are still plenty of projects that require the layout and cutting of circles and other curved shapes. Down through the centuries, certain hand tools have been developed to efficiently handle such work and the novice woodworker will do well to become acquainted with these tools and the various operations necessary to produce curved work.

The layout of circles or arcs is done, as any school child knows, with dividers or a compass. Dividers have two legs, each ending in sharp points. One leg is stabbed into the wood and the other is used to score the required circle or arc. They are a worthwhile addition to the tool kit for they are used not only for scribing circles but also for stepping off equal distances such as the spacing of dovetails and pins. The best dividers have a quadrant for rough setting and a thumb screw which provides for fine adjustment.

If you wish to mark a circle but would prefer to avoid marring the workpiece, use a compass which employs a pencil rather than a steel point. Some dividers have a removable leg that can be replaced with a pencil, but most woodworkers find that an ordinary dime store compass with a sharp pencil proves adequate.

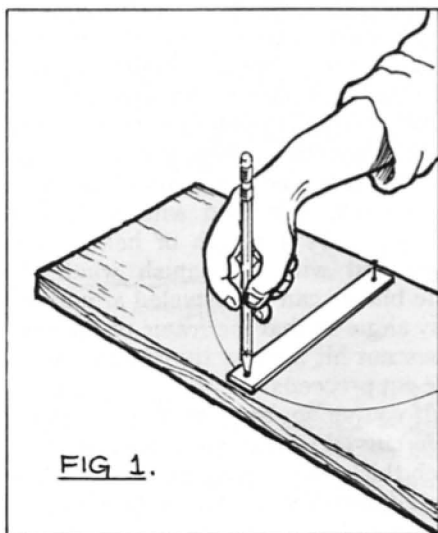


FIG 1.

Circles that are too large for a compass can be laid out with a set of trammel heads mounted on a wood beam. These may be worth buying if you plan

to do a lot of work involving large circular pieces such as table tops, but a simple shop-made device as shown in Fig. 1 is fine for occasional jobs. Just cut a thin wood strip slightly longer than the radius needed and drive a brad into the strip near one end to serve as the circle center and pivot. The radius is then measured from this pivot point and a small hole is bored through the strip, just big enough to slip a sharp pencil point through.

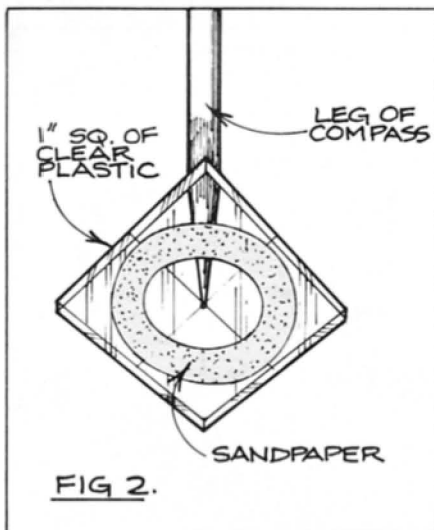
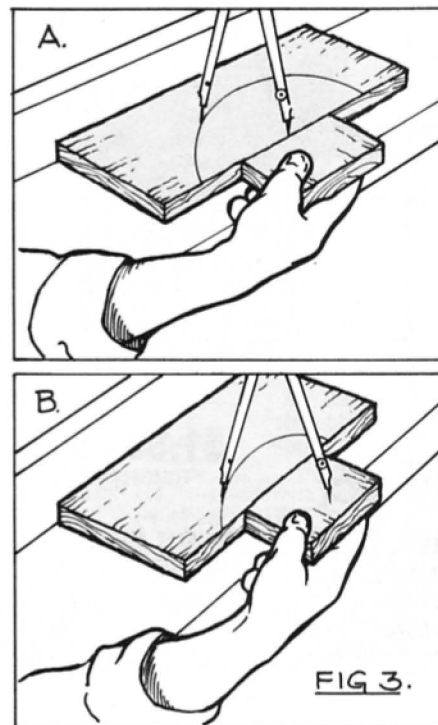


FIG 2.

Sometimes it's important to avoid marring the workpiece with a pivot hole in which case you can support the point on a square of clear plastic set over the center mark. A ring of sandpaper cemented to the bottom of the plastic will keep it from sliding while in use (Fig. 2).

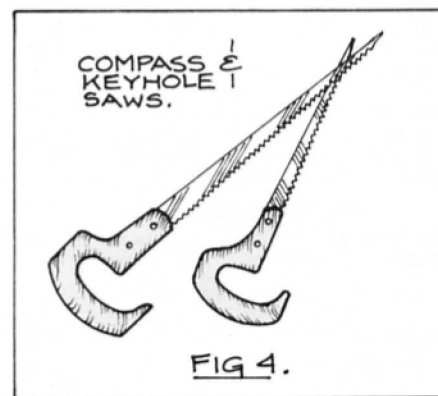
Semicircles can be scribed by locating the compass point between the workpiece and a scrap block as shown in Fig. 3A. Segments of a circle can be scribed by moving the compass point out onto the scrap block as shown in Fig. 3B.

Woodworkers use all sorts of tricks to lay out arcs and curves. In a pinch, a jar lid, large can, or any other suitable circular item found in the home can be used to trace circles or parts of circles. Curved shapes, when critical, can be laid out and drawn on graph paper, then transferred to hardboard or plywood. This is carefully cut and worked to the exact shape and then used as a template to trace the shape on the workpiece. Long gentle curves can be



smoothly traced along a thin strip of clear pine if you have a helper to hold the strip to the desired curve while you trace the line.

Cutting circles or deep curves involves approaching the grain from varying directions and this can cause nasty splintering on many woods. For this reason, it's best to make circular



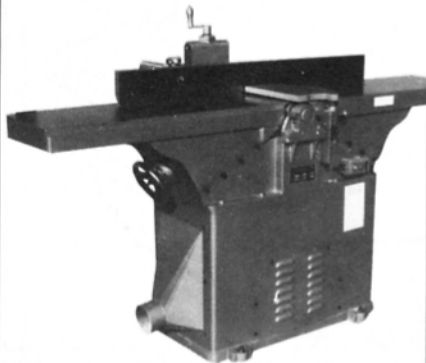
cuts not on the line but a bit into the waste side to allow for later smoothing of the cut down to the line. The hand tool usually used to cut around a circle in stock thicker than 1/2 inch is the compass saw or its smaller cousin the keyhole saw (Fig. 4). Both of these

(continued on next page)

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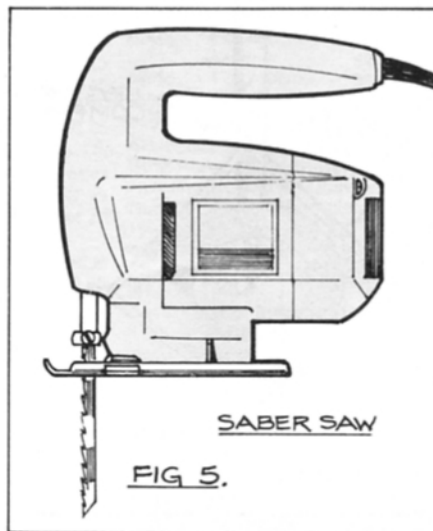
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The Beginning Woodworker, (Cont'd)

small handsaws are inexpensive and useful additions to your tool collection.

To use a compass saw to make any inside cut, an entrance hole of about ½ inch diameter is first drilled in the waste and tangent to the cutting line. The saw is then inserted and the cut is made, keeping about 1/32 inch away from the line. The workpiece should be secured in the bench vise and it's usually helpful to reposition it occasionally as the cutting proceeds.

For some reason, many beginners tend to saw too fast and furiously, and usually end up cutting into or over the line. When cutting circles, the blade is sometimes cutting with or partly with the grain and sometimes against it so the resistance is constantly changing. Remember this and take your time.



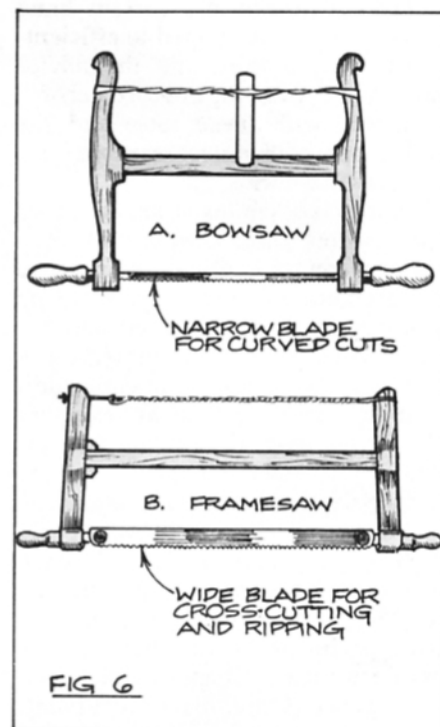
The power tool counterpart of the compass saw is the saber saw (Fig. 5). The typical "handyman" model sells for about \$20.00. These are fine for use in soft woods up to 1½ inch thickness but they don't hold up too well if used extensively with hardwoods. As with most portable power tools, it's usually cheaper in the long run to buy a "professional" or "commercial" grade.

The better saber saws have a variable speed adjustment which is very useful when you've got to carefully follow a curved line and don't want to cut too fast. Also, most of the better saws have a trammel accessory which allows the saw to cut a perfect circle around a pivot point.

Whether or not you are inclined to prefer power tools over hand tools, buy a compass saw first and use it. It's a valuable learning experience to get the feel of controlling hand tools and becoming proficient in keeping them in good condition. Besides, there will always be situations where only a small

handsaw will do the job.

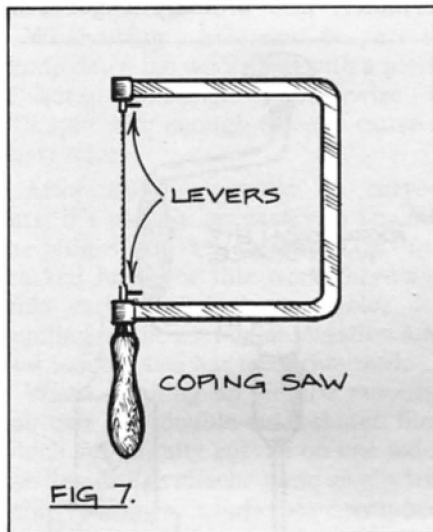
The bow or frame saw (Fig. 6 A&B), is a versatile tool for cutting large curves, particularly in thick stock. Its power counterpart is the stationary band saw. Few hardware stores stock bow saws, which accounts for the fact that they are not often found in American home shops. However, they can be obtained from most mail-order firms that specialize in woodworking tools and are quite reasonable in cost.



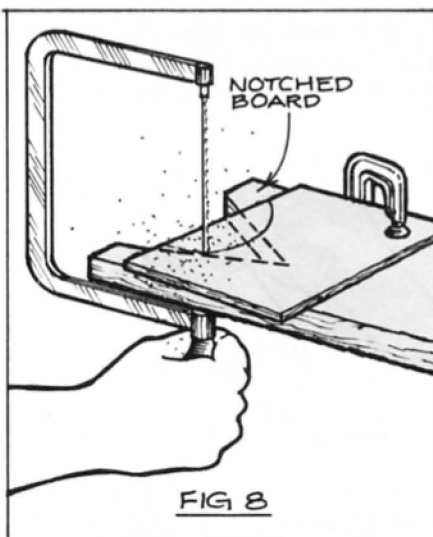
Blades for these saws come in various widths and the narrower ones are used to cut curves with small radii. The wider blades, up to 1½ inches, make these saws excellent for general crosscutting and ripping. When you become accustomed to their use, you will find that they cut a clean kerf at a greater rate of speed than the ordinary panel saw. The blades are quite thin and are held under tension by either a steel cable tightened with a thumb-screw, or by a length of heavy cord tightened with a Spanish windlass. The blades can be swiveled around at any angle so that the frame of the saw does not hit against the workpiece as the cut proceeds.

If you've got to make tight or intricate curved cuts in stock less than ½ inch thick, the coping saw is the preferred tool (Fig. 7). This little saw has a removable blade held by loops or pins which engage slots in the saw frame. A wide range of blades is available; from 10 to 32 teeth per inch. The general rule is, the smaller the radius

to be cut, the narrower the blade to be used. Like the bow saw, the blade can be tilted to any angle by moving small levers at the ends of the frame. The little blades break easily but they are inexpensive and easy to replace. When putting on a new blade, make sure that the teeth slant downward or toward the handle.



If the workpiece is small, and it usually is, the best way to use a coping saw is in conjunction with a notched board clamped to the bench top (Fig. 8). This board supports the workpiece and allows you to rotate it with the free hand while the cutting proceeds.



Closely related to the coping saw is the fret saw, which is smaller and is used for intricate cuts in delicate materials such as veneers used in marquetry work. With the proper blades, fret saws are used for cutting soft metals, ivory and other such materials used for inlays.

(continued on next page)



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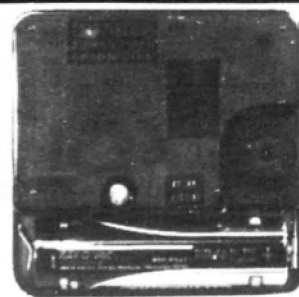
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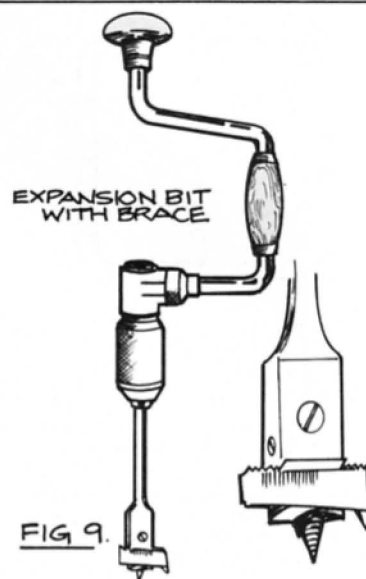
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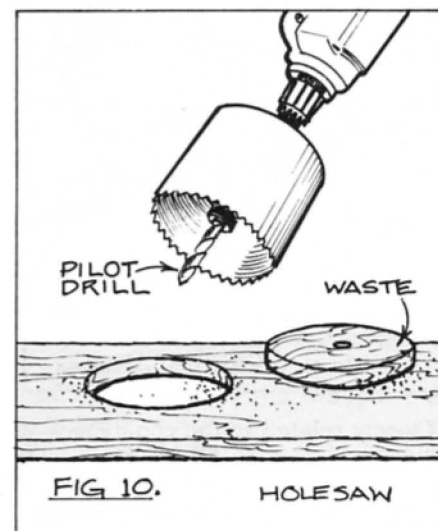
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Beginning Woodworker (cont'd)

When you've got a lot of relatively small circular holes to cut, the best approach is to use something other than a compass saw to guarantee that all the holes will end up exactly alike. For holes up to 3 in. in diameter, an expansion bit chucked in a brace will do a good job (Fig. 9). These bits are adjustable to cut holes from 1/8 to 3 in. diameter. Like ordinary auger bits,

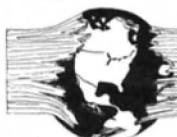


they have a screw tip so boring completely through from one side will result in bad splintering. When using an expansion bit, or any auger with a screw tip, bore only until the screw starts to emerge from the opposite side; then remove the auger and complete the hole by boring from the other side.



Another solution to the problem of making a lot of perfectly circular cut-outs up to 4 in. diameter is to use a hole saw (Fig. 10). These must be used with an electric hand drill or better

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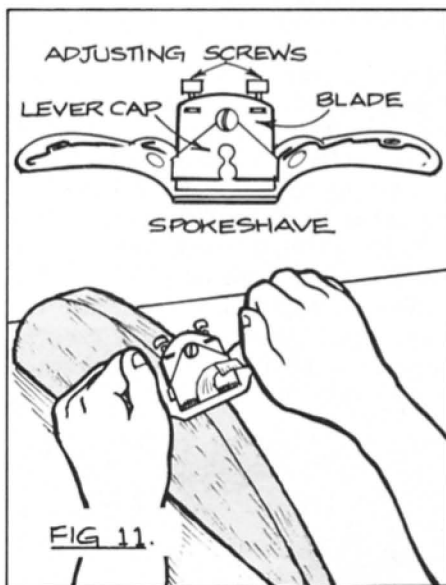
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yet, a drill press, as they require a lot of torque to cut, especially in hardwoods. They consist of two main parts: a central arbor with a 1/4 in. pilot twist drill around which a steel cup with saw teeth is mounted. The twist drill locates the center and the cup saw revolves into the wood removing a disc of waste with a hole in the center where the drill entered.

When using a hole saw, be sure to clamp down the workpiece with a piece of scrap underneath, otherwise it will spin with enough force to cause a nasty injury.

After making circular or curved cuts, it's usually necessary to smooth the edges of the cut down to the marked line. For this work there's a wide variety of tools available, depending on the particular situation and how much waste has to be removed.

When cleaning up circular cutouts, you can use double-cut cabinet files which are slightly curved on one side, sanding drums chucked into an electric drill, or just sandpaper wrapped around a suitable dowel. Your aim is to smooth the edges of the cut right to the line without splintering or making the curve unfair.



Long outside curves cut with a bow or saber saw can be smoothed down with a spokeshave (Fig. 11). This tool cuts much like a plane with a depth of cut that can be regulated. The blade (which is sharpened like a plane blade or chisel), is usually held by a lever cap which has adjusting screws to raise or lower the blade depending on how thick a shaving you want to take. The tool can be pulled or pushed according to the situation, but more control is achieved by pulling it toward you. W&J



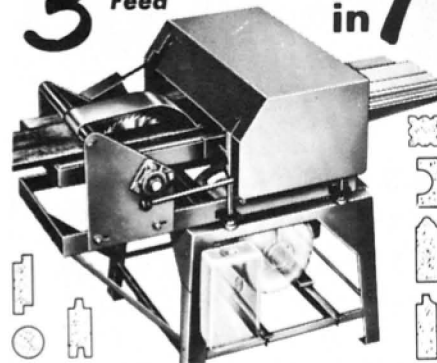
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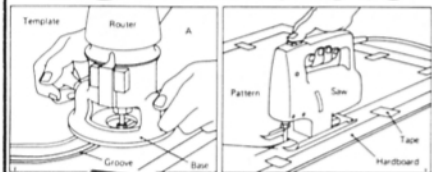
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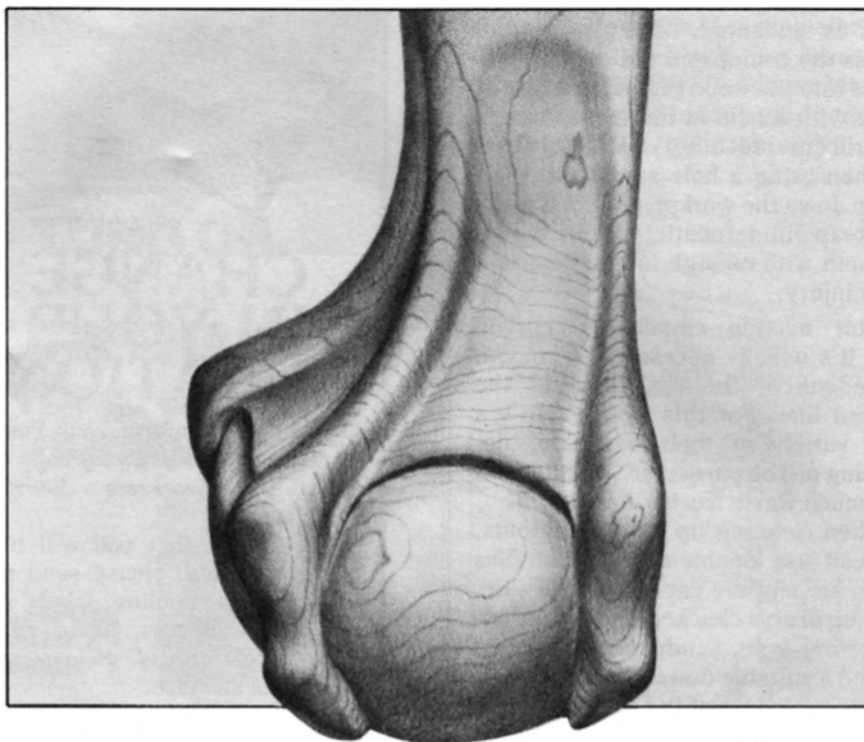
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Special Techniques

by Roger Schroeder

Carving the Ball-and-Claw Foot



Editor's Note: Last issue in this column, we discussed the various steps involved in making a cabriole leg. This issue, Roger Schroeder takes us one step further and explains how to add a ball-and-claw foot—a process that's not as mysterious as is often imagined. Roger's text and photos take you from start to finish.

There is no standard ball-and-claw leg. Like furniture itself, styles differ considerably, especially with the foot. The clutched ball may be almost square or completely round. The claws may be heavily or only slightly knuckled, equally separated or far apart, or the claws may even be undercut to reveal the top of the ball.

The ball-and-claw leg I carve reflects a typical style often copied by today's cabinetmakers, with some touches of my own. These include a look of tension in the ankle muscles and a well-rounded ball only slightly flattened on its bottom. Also taken into consideration is the leg design.

An early-on piece of pre-carving advice is to work with sharp tools. An easy test of sharpness is to cut into or gouge the wood on its end grain and look at the surface of the cut. If it feels and looks glassy smooth and shiny, the tool is probably sharp enough.

My approach to carving is to make

tentative or shallow cuts, establishing the shape and details through a slow process of wood removal. I rough out the entire piece, leaving the features somewhat bulky. Then I go back to establish the fine details.

Yet another consideration is clamping. Owing to its shape, the cabriole leg defies simply putting it into a vise or holding it to a bench with clamps. But there are three possibilities. The traditional approach is to secure the leg between bench dogs on a cabinetmaker's workbench (photo 1). A wood scrap will be needed between the foot

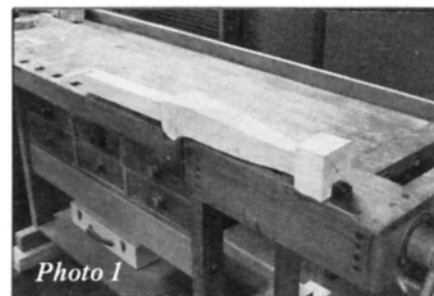


Photo 1

and the steel bench dog because the risk of hitting the dog with a carving tool is great. Another, perhaps unique, possibility is to clamp the leg between lathe centers (photo 2). Many older models have indexing holes in the pulley wheel with an engaging pin in the live center housing. This pin will keep

the pulley stationary. It was incorporated into lathe designs to allow for fluting and carving turned legs. Still another approach requires a sturdy bench vise and a bar clamp with sizable jaw depth. The leg is secured, end to end, in the clamp, then the bar of the clamp is held firmly in the bench vise.

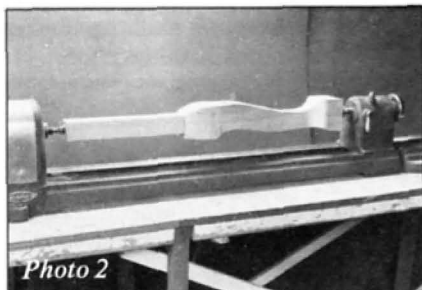
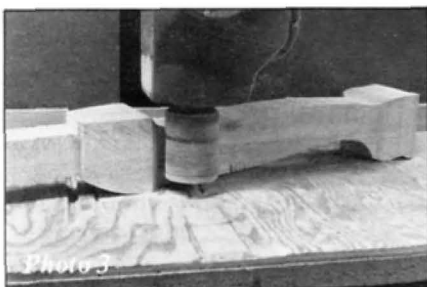
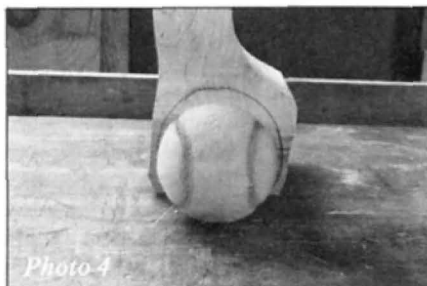


Photo 2

Before I clamp the bandsawed-to-shape leg, I first smooth its sides with a sanding drum mounted on a drill press or radial-arm saw (photo 3). It is easier to do this while the leg is still basically square and a smooth surface allows me to draw pencil lines on the sides that will indicate where I will remove the wood.



Before carving begins, I first want to establish the size and location of the ball and four claws that surround it. A tennis ball is almost the right diameter for a leg of this size, so I like to use one as a visual reference (photo 4).



There is that tendency to under-carve, leaving the ball almost box-like, which is the way the first one I ever did looked. One way to avoid this problem is to use a compass and, on one side of the foot, scribe a circle that goes nearly to the vertical faces, but with about one-fifth (or less) of its area below the bottom of the foot (photo 5). The thinking here is that the more ball above the bottom of the foot, the more carving you'll have to do to get it round.

At the two points the circle intersects the bottom of the foot, I transfer a pair of parallel lines to the bottom (see A, photo 5). Within these lines, I draw another circle (see B, photo 5). This will be the outline to which I will remove wood as I establish the shape of the ball.

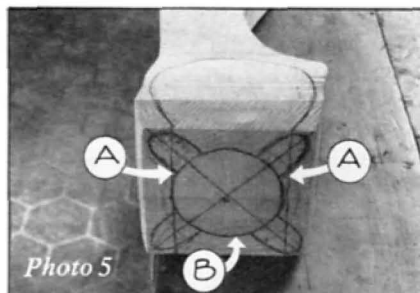


Photo 5

The next step is to draw the cross-sectional profiles of the claws on the bottom (see A, photo 6). Though some period furniture has legs done so the claws are angled toward the back of the leg to reveal more of the ball from the front, mine are spaced equally apart with their locations at the corners of the still square foot.

Next, I draw the guidelines that represent the profiles of the claws along the corners of the foot toward the ankle (see B, photo 6). And here is a rewording of earlier advice: it is better to keep these claws wider than you might think necessary. You can always reduce their width if too big.

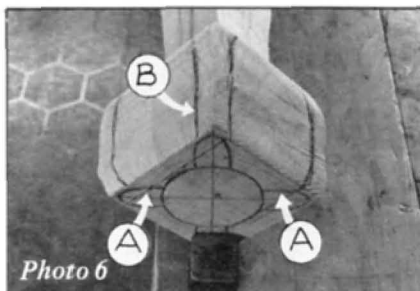


Photo 6

Still more lines need to be drawn before carving begins. These will indicate where to take off wood on the leg corners. It is necessary, I should point out, only to round off the corners, not the entire leg. On the leg front, I draw lines in from the edge but bring them to the center when I reach the narrowest part at the ankle (see photo 7). I do the same for the backside of the leg.

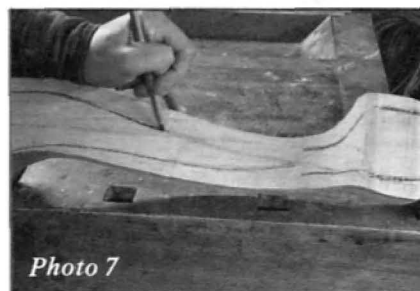


Photo 7



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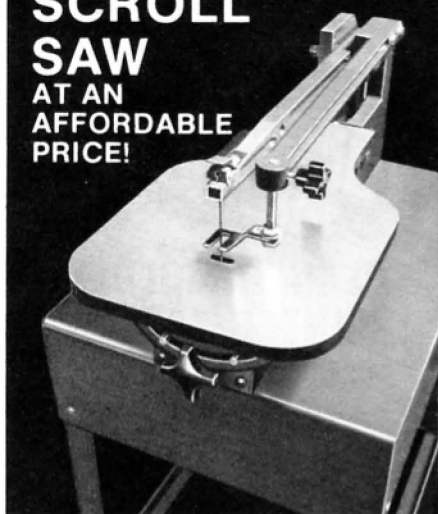
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Special Techniques, (Cont'd)

There are several traditional tools available to eliminate these sharp corners. One is the spokeshave. Another is the drawknife. But the tool I use, which is in keeping with the carving, is a large fishtail gouge. A number 2 or 3 sweep, about 1½ in. wide, will effectively do the work owing to its size and weight (photo 8).



Photo 8

You will discover what grain direction is all about when you reach the ankle. Here, if you try to go "uphill" instead of down, the grain will tear. You must reverse direction when that happens and go down the leg from the other direction (photo 9). This will also

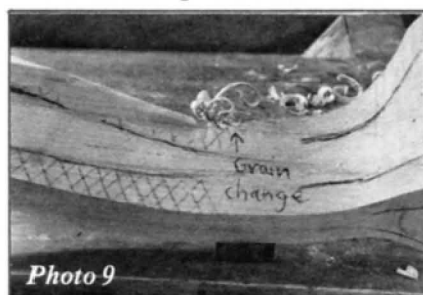


Photo 9

be the case at the outermost point of the knee.

After nearly all the wood has been "beveled" away with the fishtail, the tool can be reversed to help round out the gouge marks (photo 10). This is really a finishing cut practiced by old-



Photo 10

time carvers, but keep in mind that the tool should be exceptionally sharp before it is done.

The claw profiles are carved next. Here again, a grain change is going to take place as the claw follows the shape of the ball. For this reason, I find it helpful to draw a horizontal line across each face of the foot to indicate

the center of the ball. This line tells me that I will be carving down either side of the line as I establish the claws and ball.

The best tool for defining the claws is a number 14 V-parting tool that has a slightly rounded bottom. The one I use is about ½ in. wide. When carving, make sure you are not cutting underneath the claw and thereby removing too much wood (photo 11).

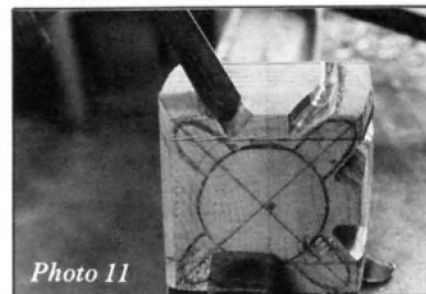


Photo 11

Also, you may discover, after your cuts are made, that the claw goes to one side. But if the claw is left bulky or thicker than necessary, it can be "straightened out" in the final stages by carving away wood on one side or the other.

I also want to start rounding the ball. For this I utilize a carver's chisel, about 1 in. wide, that has long bevels on both its sides. This leaves flat rather than concave cuts. Again, work away from the ball's centerline (photo 12). Note that the horizontal line (see arrow) indicates the center of the ball.

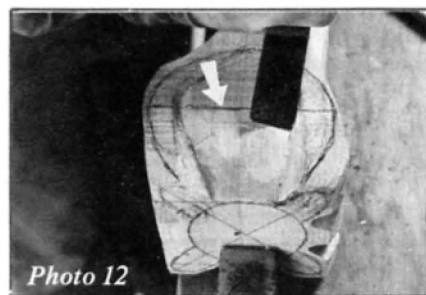


Photo 12

The claws of the leg will gradually change into muscles in the ankle and then disappear altogether. That area and the location of the webs on the ball have to be dealt with next. Since the V-parting tool would leave too sharp a line in the muscle-ankle area, I switch to a number 11 veiner, about ¼ in. wide. With this tool giving me a "soft" cut, I continue the claw lines left by the V-parting tool up into the ankle. However, I decrease the depth of the cut the farther up I go (photo 13).

An interesting consideration arises: how far up the ankle does one go? What I have discovered on period furniture is that the farther up the ankle one carves, the more definition is given to the muscles and the more

feeling of a clutching tension is given to the claws. The dotted lines (photo 12) indicate possibilities, though you can conceivably go halfway up the leg without the effect being exaggerated.

Now I make the web profiles (see arrow, photo 13). It is probably safest to draw them on the front sides about where the claws are crooked. On the rear sides, draw the webs the same distance from the foot's bottom. These profiles can always be carved back, as I end up doing later on, to reveal more of the ball.

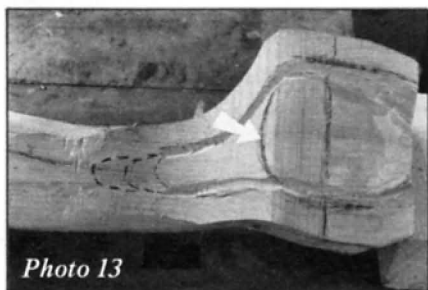


Photo 13

Next I carve wood away between the ankle muscles with a number 7 gouge about $\frac{3}{4}$ in. wide. I do this so the claw muscle profiles will stand out as they go up the leg and disappear. I also flare out my gouge cuts, made lightly and overlapping, into the channel left by the number 11 veiner used in the previous step. A grain change will have to be dealt with in the narrowest portion of the ankle, so carving in both directions will be required (photo 14).

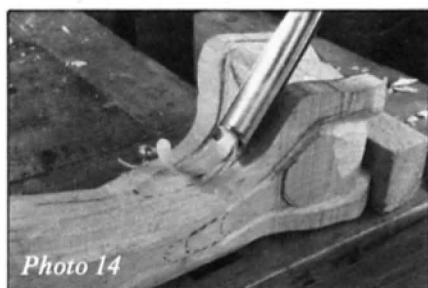


Photo 14

Some writers suggest using a gouge that has the same sweep or profile as the web to relieve or raise the area. I do not recommend this, however, since there is a real danger of causing the wood to split away on the web. Chisels and gouges, with their bevels acting as a wedge, force wood away. If the wood adjacent to the cut has not been removed, the wedging action will cause a split or stress crack along a grain line.

What I use to outline the web is a number 12 V-parting tool about $\frac{1}{4}$ in. wide. With it, I start at the middle of the web and work away from the center point, moving down into the claw areas. At the same time, I undercut the web slightly. This will leave a slight shadow that will accent the web (photo 15).

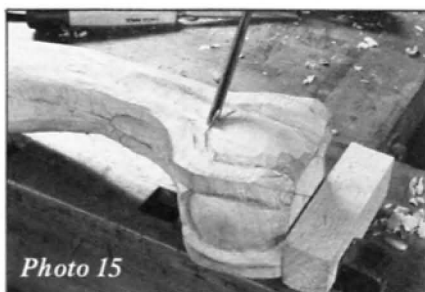


Photo 15

I now start removing the wood from the ball centerline to the web. A number 2 or 3 gouge about $\frac{1}{2}$ in. wide will be useful here (photo 16). Too wide a gouge will conflict with the curve of the web.

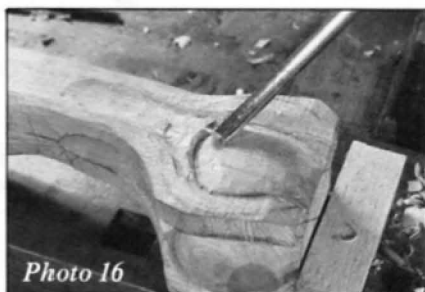


Photo 16

At this point, the basic profile of the ball and claw has been established. I now go back to the beginning and basically start the process over, striving for more refined detail. The first thing I must do is bring the claws to points at the base of the ball. For this I

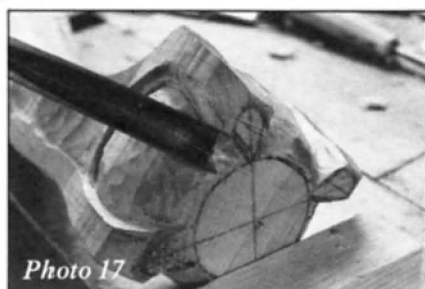


Photo 17

again use the number 14 V-parting tool (photo 17). With the number 2 or 3 gouge or with a straight chisel I can round over each claw as it comes to a point.



Photo 18

I then come back with the number 12 V-parting tool and undercut slightly the area where the claws overlay the ball (photo 18). This, too, will accent their features by adding a slight shadow. I will also continue to undercut the web and carve back the ball.

Since this step will make the web thicker, I will have to lower it with that number 2 or 3 gouge.

Knuckles are also a feature of the claws, and for this I use that small number 2 or 3 gouge and scoop out depressions in the middle of the claws below the webs (photo 19).

Another thing I do is remove a slight amount of wood at the points of the claws, making them above the base of the ball. This will give some more definition to the ball (photo 19).



Photo 19

I also want to round over the claws and muscles as much as possible with the small gouge and work on removing wood in tight areas such as under the webs and at the edges of the claws. For this a number 2 or 3 fishtail about $\frac{3}{8}$ in. wide is ideal (photo 20).

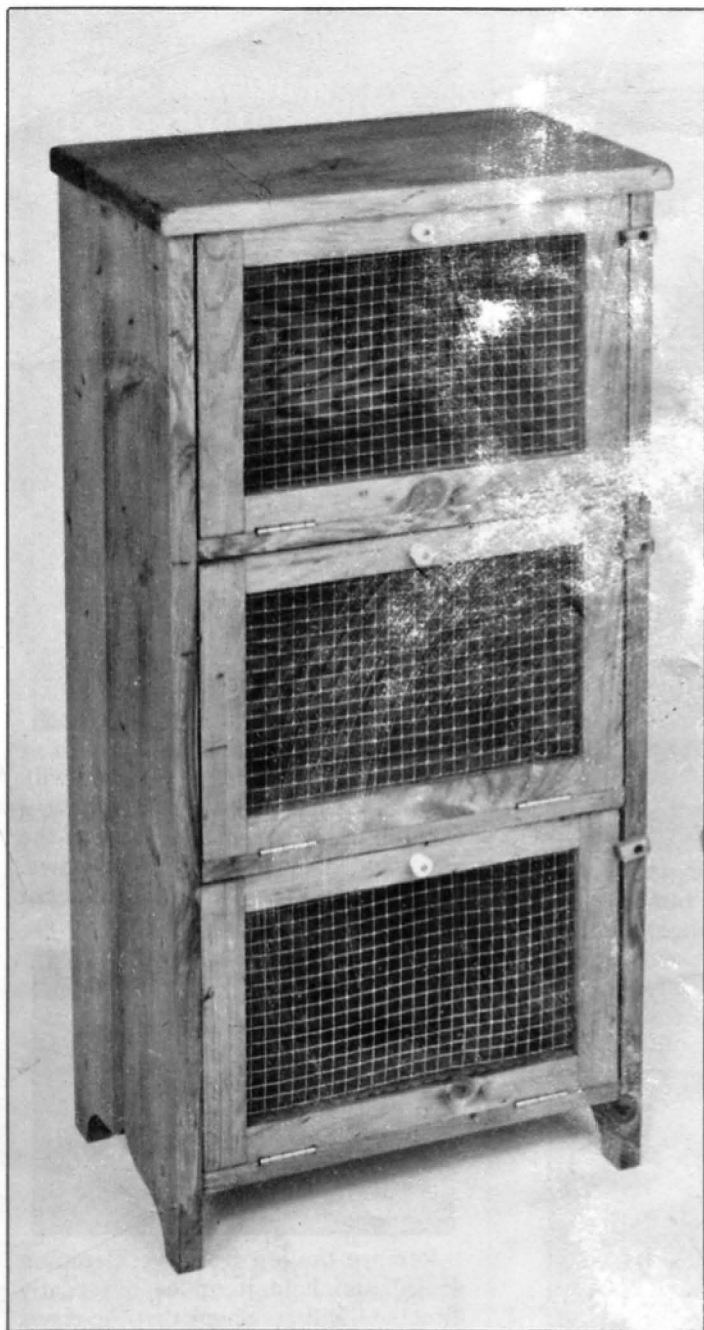


Photo 20

Remove the leg from the clamping device and hold it under differently directed lighting. Check that the claws do not "twist" from side to side; also check that the ball is round and that you haven't carved four semi-spheres because you cut back too much with the V-parting tools.

Since you will most likely be carving four legs instead of one, chances are the fourth will be better carved than the first. Be prepared to go back and do some re-carving on the earlier legs.

The final step involves an introduction of modern technology. Over 75 percent of the final sanding can be achieved with a careful use of a palm-sized finishing sander. Nothing else will remove the facets or planes left by carving tools as fast, even on much of the claw's and especially the ball's surface. Where it will not get at is in the ankle area, which will have to be sanded by hand or some other device. A final sanding of the entire piece will complete the leg.



Country Vegetable Bin

Here's a charming reproduction of an old-time country vegetable bin, an item that is as practical in today's kitchen as it was years ago. It also makes a useful general storage cabinet that can be put to use in just about any room in the house. We suspect that many readers will find it serves

Bill of Materials (All Dimensions Actual)

Part	Description	Size	No. Req'd.
A	Side	$\frac{3}{4}$ x 11 x 35 $\frac{3}{4}$	2
B	Shelf	$\frac{3}{4}$ x 10 $\frac{3}{4}$ x 16 $\frac{3}{4}$	3
C	Top	$\frac{3}{4}$ x 11 $\frac{1}{2}$ x 18 $\frac{1}{2}$	1
D	Door Stop	$\frac{3}{4}$ x $\frac{3}{4}$ x 16	3
E	Back	$\frac{1}{4}$ x 16 $\frac{3}{4}$ x 33 $\frac{3}{8}$	1
F	Stile	$\frac{3}{4}$ x 1 $\frac{1}{4}$ x 10 $\frac{1}{4}$	6
G	Rail	$\frac{3}{4}$ x 1 $\frac{1}{4}$ x 16	6
H	Screen	As Req'd	3
I	Molding	As Req'd	

especially well as a place to keep linens.

Ours is made from pine, a wood commonly used by country cabinetmakers. Oak would be another good choice.

Begin construction by making the two sides (parts A). If you can't locate 1 x 12 stock (which measures 11 $\frac{1}{2}$ in. wide), it will be necessary to edge-glue two or three narrower boards to get enough width. Apply a thin coat of glue to the mating surfaces, then clamp firmly with several bar or pipe clamps. When edge-gluing, it's a good idea to allow a little extra length and width of stock. Later, after the clamps have been removed, it can be trimmed to final length and width on the table or radial-arm saw.

Next, lay out the location of the $\frac{3}{4}$ in. wide by $\frac{3}{8}$ in. deep stopped dados that are cut to accept the shelves (parts B). A router equipped with a straight bit provides the easiest way to make this cut; simply clamp a straightedge guide to the side stock, offsetting the guide an amount that will properly locate the router bit. If a $\frac{3}{8}$ in. diameter router bit is used, you'll need to relocate the straightedge to get the $\frac{3}{4}$ in. width that's needed.

Note that each dado on part A is stopped at a point $\frac{3}{4}$ in. from the front edge. The router will leave rounded corners, so a chisel is used to square them off.

In order to accept the back (part E), a $\frac{1}{4}$ in. deep by $\frac{3}{8}$ in. wide rabbet is then cut on the back edge of each part A. This is best done on the table saw in conjunction with a dado-head cutter, although repeated passes with a regular saw blade will also do the job.

Next, transfer the profile of the bottom curve from the drawing to the stock. Use a saber saw or band saw to cut to shape. Cut slightly on the waste side of the stock, then sand to the marked line.

The three shelves (parts B) can be made next. If stock must be edge-glued, follow the same procedure as was used earlier. Once dry, trim to final length and width, then cut the $\frac{3}{8}$ in. by $\frac{3}{4}$ in. notches on each of the front corners as shown.

After the top (part C) has been cut to size, parts A, B, and C can be given a thorough sanding, finishing with 220 grit paper. Apply glue to the mating surfaces of parts A and B, then clamp with bar or pipe clamps. Note that the front of parts B are flush with the front of parts A. Check for squareness; if all looks o.k., set aside to dry. Once dry, bore holes for $\frac{1}{4}$ in. diameter by 1 in. long dowel pins. Cut each dowel pin slightly over length, then add glue and drive into place. Trim the excess with a dovetail saw before sanding smooth. Part C is added in the same manner.

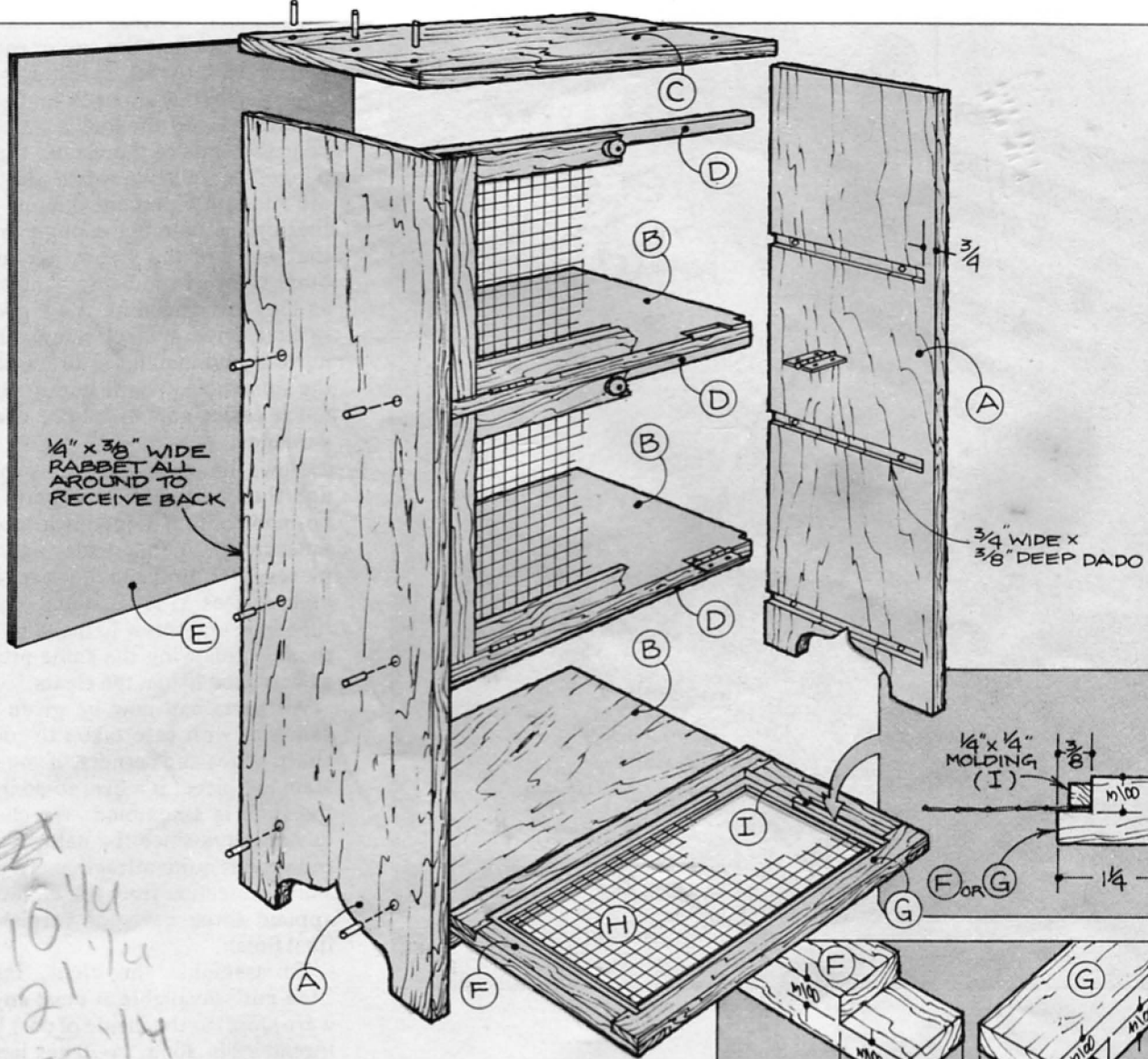
With part C in place, a router equipped with a piloted $\frac{3}{8}$ in. rabbet bit can be used to cut the $\frac{1}{4}$ in. deep by $\frac{3}{8}$ in. wide rabbet along the back of part C. Note that the rabbet is stopped at each end. A sharp chisel can be used to square the rounded router bit cut. The back (part E) is then cut to size and glued in place. A few small finishing nails will hold the back in place as the glue dries.

The door stiles (parts F) and rails (parts G) can be made next. Cut to length and width from $\frac{3}{4}$ in. stock, then use the dado-head cutter to cut the half-lap joints on each end. Apply glue to each joint and clamp securely. Once dry, a router with a $\frac{3}{8}$ in. piloted rabbet bit is used to cut the $\frac{3}{8}$ in. deep by $\frac{3}{8}$ in. wide rabbet that accepts the screen (part H) and the molding (part I).

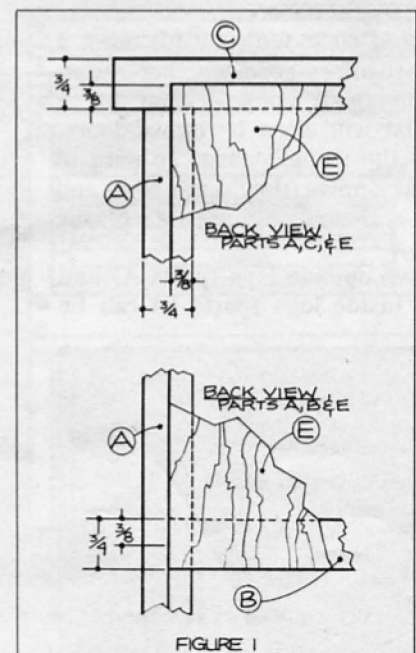
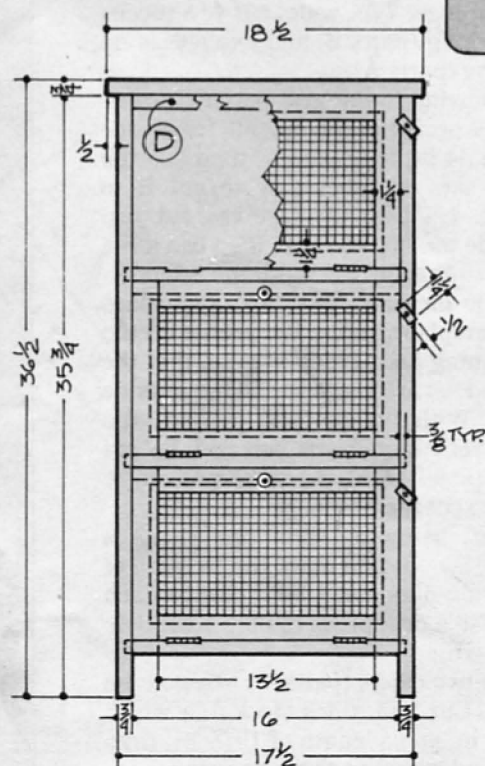
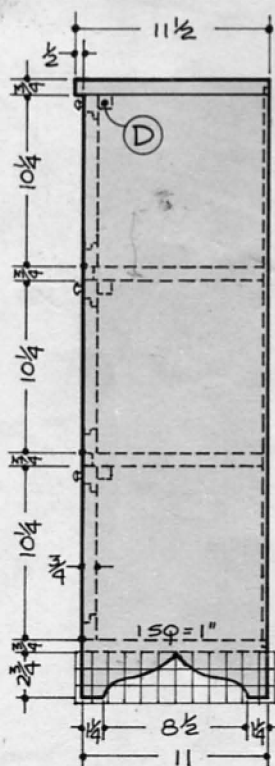
We used $\frac{1}{2}$ in. mesh galvanized steel screen (available at just about any hardware store) for part H. Four strips of $\frac{1}{4}$ in. by $\frac{1}{4}$ in. molding, each secured with two or three finishing nails, will hold the screen in place.

Final sand all surfaces, then finish to suit. We used two coats of Minwax's Golden Oak Finish followed by two coats of their Antique Oil Finish. The addition of brass hinges and porcelain knobs completes the project.

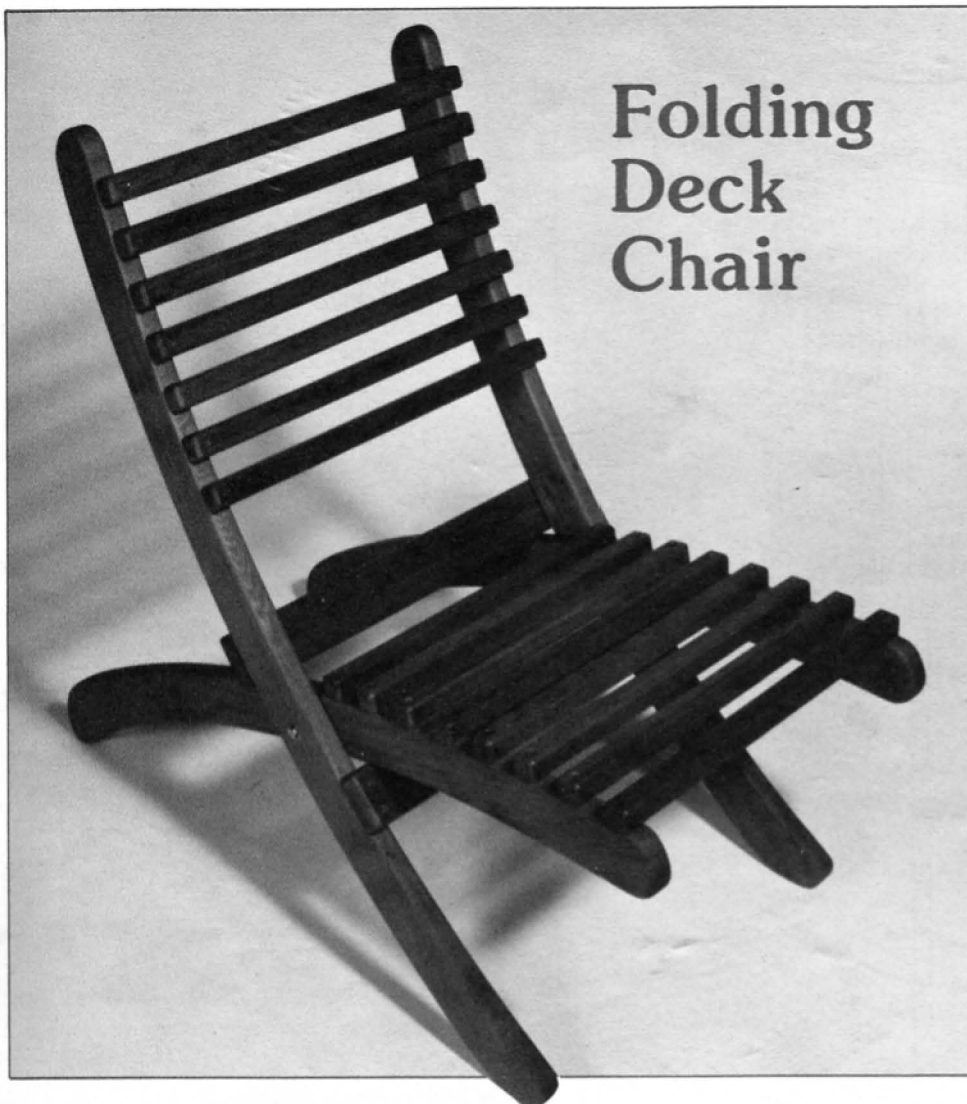
W&J



2x
10 1/4
21 1/4
32 1/4



3750



With that long awaited summer weather soon to be here, we're sure that you'll find many ways to put this sturdy outdoor chair to good use. It folds nearly flat, a feature we particularly like since it makes the chair easy to carry and store.

We used clear redwood for ours, a wood that offers good weather resistance, no small consideration for a piece that will often be out-of-doors. And for the same reason, be sure to use brass screws (they don't rust) and a water-resistant glue such as plastic resin.

The two outside legs (parts A) and the two inside legs (parts B) can be

made first. Readers will note that, except for length, both parts are identical. From 1 in. thick stock that measures at least 7 in. wide, cut two pieces 40 in. long (parts B) and two pieces 44 in. long (parts A).

Referring to the grid pattern, transfer the profile of the outside leg to one of the 44 in. long pieces, then use the band saw or saber saw to cut it to shape. It's best to make the cut just outside the marked line, then use a file and sandpaper to smooth the edge exactly to the line. Now, with this piece as a template, scribe the profile on the remaining parts (keep in mind that the inside legs are shorter than the outside legs). With the profiles scribed, the three remaining parts can now be cut to shape following the same procedure used to cut the first part.

Next, using the grid pattern as a guide, lay out and mark the location of the $\frac{1}{4}$ in. diameter pivot holes on each leg. Use a drill press to bore each hole as shown.

The two cleats (parts C) can now be made. Cut 1 in. thick stock to a width of $2\frac{1}{2}$ in. and a length of 19-7/16, then glue and screw to the legs using 2 in.

by number 8 brass flat head wood screws. Note that the end of each cleat is flush with the leg sides. The screws are countersunk about $\frac{1}{8}$ in. below the surface. Since the holes are located near the ends of the cleats, there is a danger of splitting when the screws are added. To prevent this, be sure to first drill a hole big enough to accept the shank of the screw. To keep the brass screws from being "chewed up" as they are driven in, it's a good idea to first drive a steel screw, then remove it and install the brass screw in the same hole. You'll find it will go in much easier and with little chance of damage.

Now, the seven back slats (parts D) and the eight seat slats (parts E) can be made. From 1 in. thick stock that measures $1\frac{1}{8}$ in. wide, cut seven pieces 19-7/16 in. long (parts D) and eight pieces $17\frac{3}{8}$ in. long (parts E), then glue and screw to the legs. Join to the legs following the same procedure as was used to join the cleats.

All parts can now be given a final sanding, with care taken to round all sharp edges and corners. If you plan to stain the piece, it's best to do it before the chair is assembled. We chose not to stain ours since the natural color of redwood is quite attractive. To provide some protection from the elements we applied three coats of varnish for a final finish.

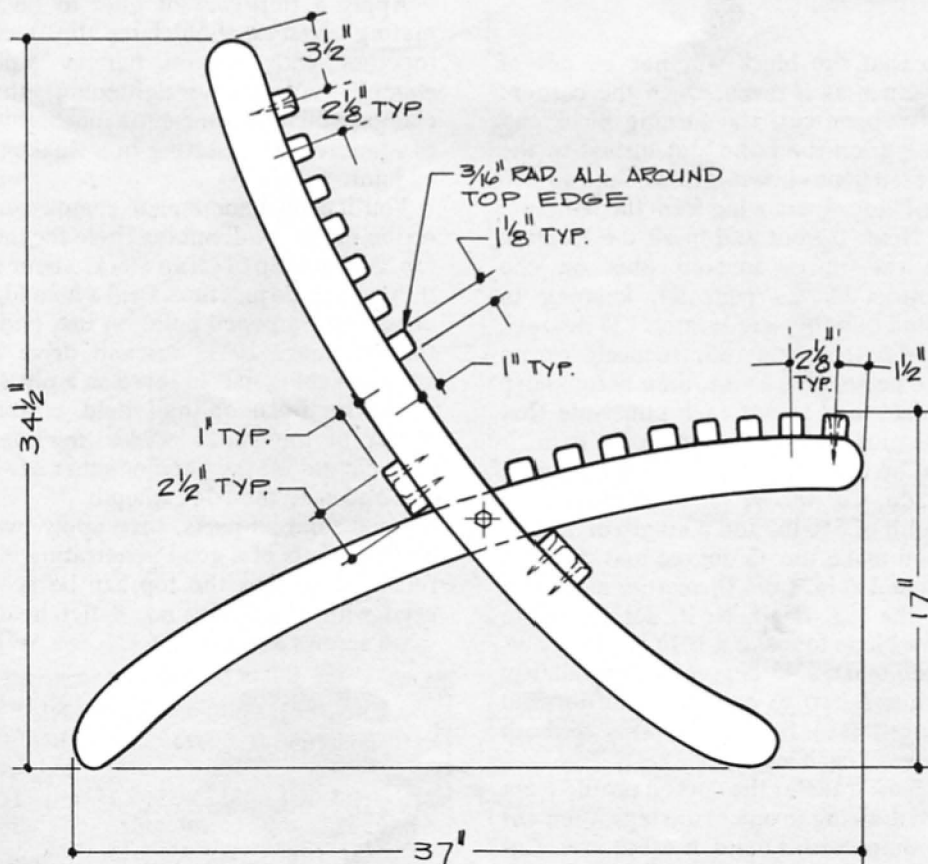
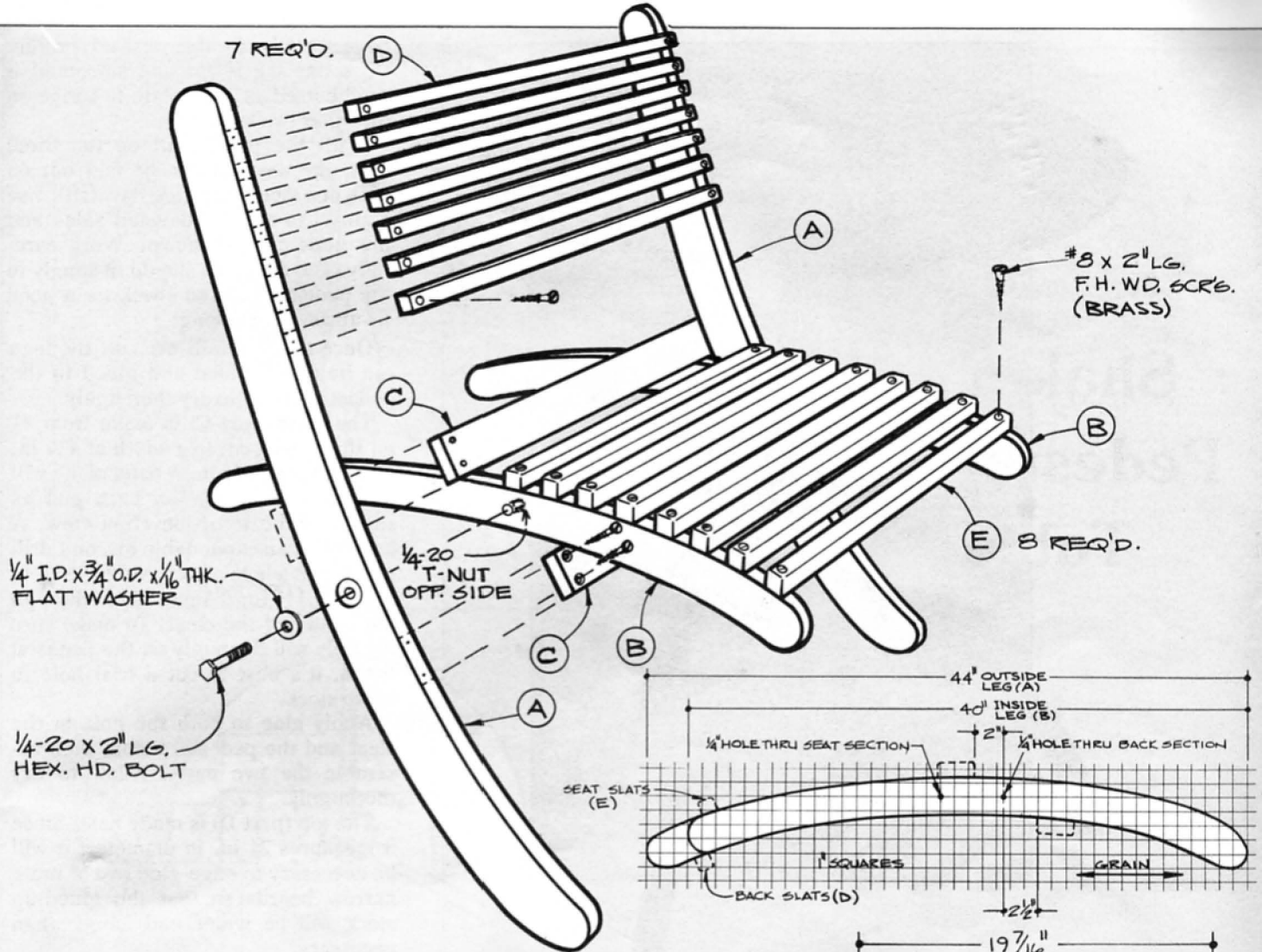
To assemble the chair, install a "tee-nut" (available at most any hardware store) to the inside of part B, then thread a 2 in. long, $\frac{1}{4}$ -20 hex head bolt and washer from the outside as shown.

Wwj

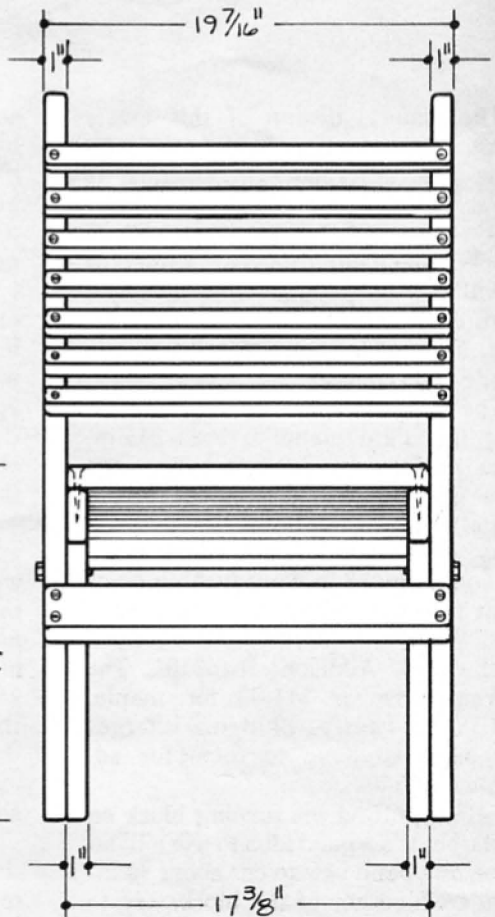


Bill of Materials
(All Dimensions Actual)

Part	Description	Size	No. Req'd
A	Outside Leg	1 x 7 x 44	2
B	Inside Leg	1 x 7 x 40	2
C	Cleat	1 x $2\frac{1}{2}$ x 19-7/16	2
D	Back Slat	1 x $1\frac{1}{8}$ x 19-7/16	7
E	Seat Slat	1 x $1\frac{1}{8}$ x $17\frac{3}{8}$	8

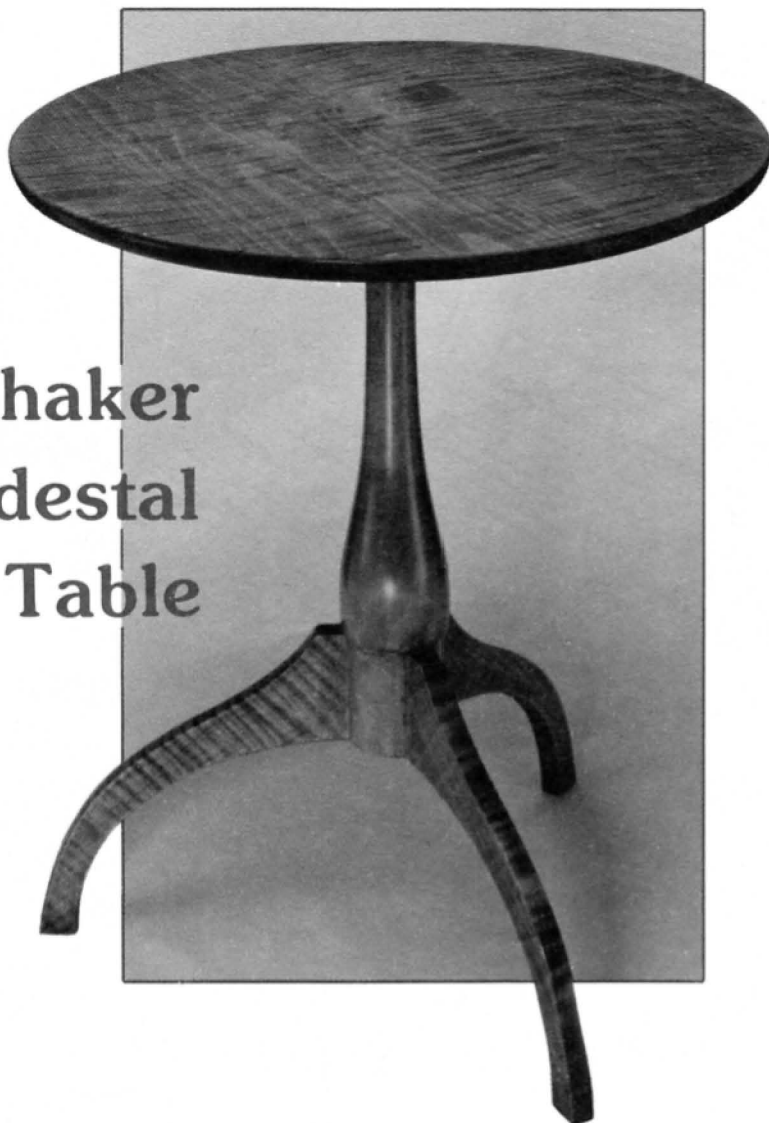


LEFT SIDE ELEVATION



FRONT ELEVATION

Shaker Pedestal Table



The general design of this lovely piece comes from a Shaker pedestal table made in Hancock, Massachusetts around 1840. It's a classic piece, one that's been copied many times, and we suspect that a hundred years from now it will still be popular. Ours is made from curly maple, although the original, like much Shaker furniture, was made from cherry.

The pedestal (part A) can be made first. If you are unable to find a 3½ in. thick piece of turning stock, you can glue up two pieces of 8/4 (1¾ in. actual) lumber to get the 3½ in. thickness. Another option is to purchase a 4 in. square by 18 in. long turning block from the mail order company Craftsman Wood Service, 1735 West Cortland Court, Addison, IL 60101. The current price is \$11.98 for maple, \$12.78 for cherry. Shipping charges are extra so write to them for additional details.

Before putting the turning block on the lathe, it's a good idea to use a hand plane or a band saw to cut about ¾ in. from each corner of the block. Try to remove approximately the same amount of material from each corner

so that the block will not be out of balance as it turns. Once the corners have been cut, the turning block can be put on the lathe and turned to the dimensions shown. Finish sand to 220 grit before removing from the lathe.

Next, lay out and mark the location of the three dovetail pins on the bottom of the pedestal, keeping in mind that they are located 120 degrees apart. Once marked, securely clamp the pedestal in a vise, then use a sharp chisel to chop out each pin. Note that the pins are cut to a depth of 9/16 in.

The three legs (parts B) can now be made. Cut the ¾ in. thick stock to a width of 5½ in. and a length of 15 in., then make the 45 degree end cut at a point 3½ in. from the corner as shown in the leg detail. Next, set the table saw blade to make a 1/16 in. deep cut, then make a 45 degree cut (parallel to the end cut) to establish the dovetail length (see fig. 1). Do this to both sides of each leg.

Now transfer the curved profile from the drawing to one of the legs, then cut to shape with a band or saber saw. Cut just outside the line so that a file and sandpaper can be used to smooth the

edge exactly to the desired profile. Once one leg is cut and smoothed it can be used as a template to scribe on the other two legs.

With the profile cut on the three legs, the dovetail can be laid out on each one (see detail: leg dovetail). Use a chisel to cut the dovetail sides and the undercut as shown. Work carefully. The dovetails should fit snugly in the pedestal pins so check for a good fit-up as you go along.

Once the dovetails are cut, the legs can be final sanded and glued to the pedestal. Allow to dry thoroughly.

The cleat (part C) is made from ¾ in. thick stock cut to a width of 4¾ in. and a length of 15 in. A hand plane will quickly add a taper on each end as shown in the front elevation view. A brace with an expandable bit, or a drill press with a hole cutter, can be used to bore the 1½ in. diameter hole through the center of the cleat. To make sure the hole will fit snugly on the pedestal tenon, it's best to cut a trial hole in scrap stock.

Apply glue to both the hole in the cleat and the pedestal tenon, then assemble the two parts. Allow to dry thoroughly.

The top (part D) is made next. Since it measures 21 in. in diameter, it will be necessary to edge-glue two or more narrow boards so that the glued-up stock will be wider and longer than necessary.

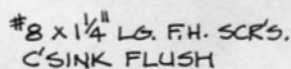
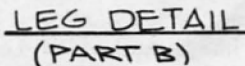
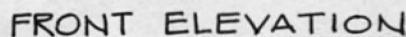
Apply a thin coat of glue to both mating surfaces, then clamp the stock together with several bar or pipe clamps. Avoid overtightening the clamps which can cause too much glue to squeeze out, resulting in a weakened joint.

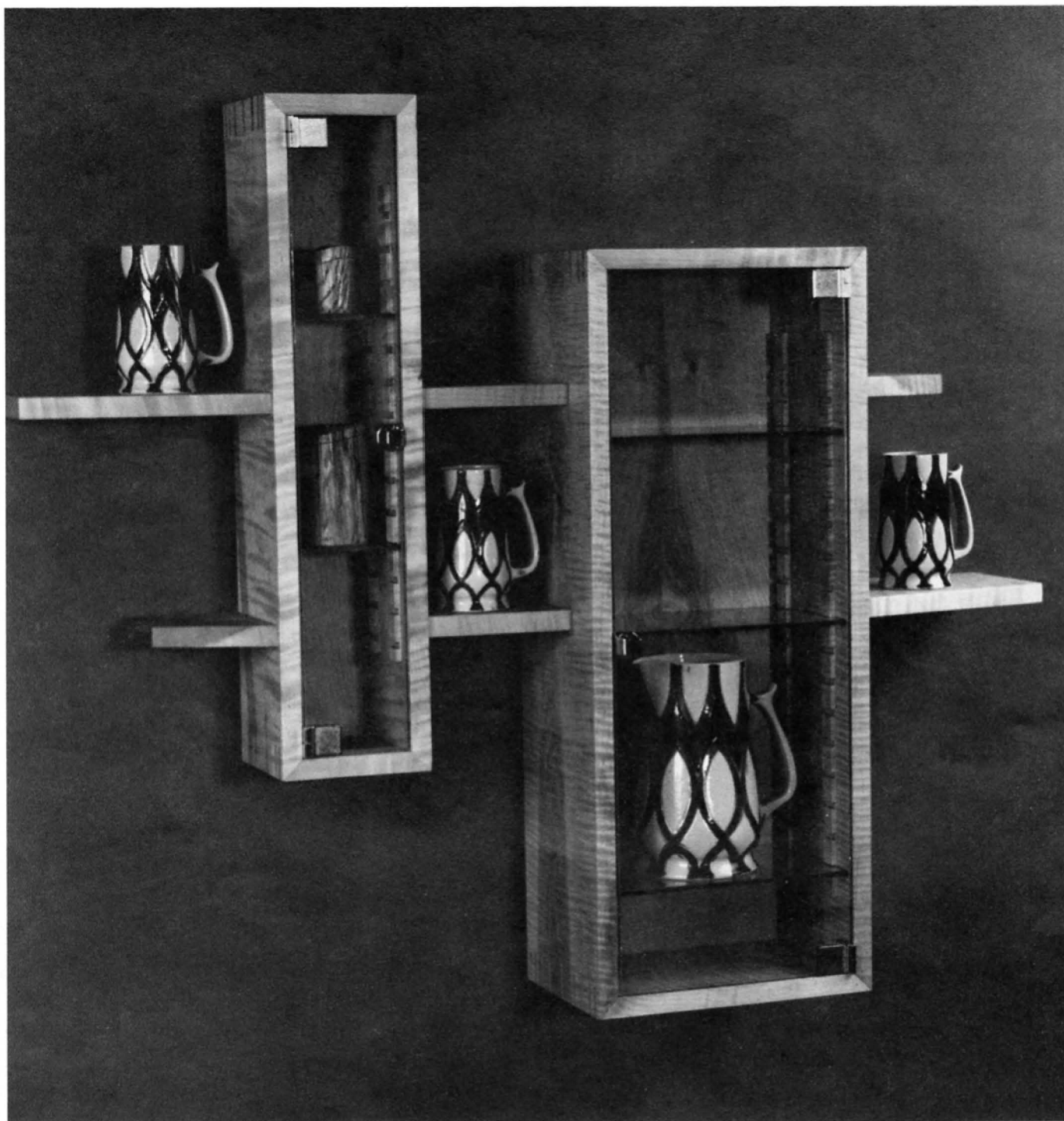
You'll need a homemade compass to scribe the 21 in. diameter circle for the top. A thin strip of scrap stock, about 2 ft. long will do just fine. Drill a hole big enough for a pencil point on one end, then measure 10½ in. and drive a small finishing nail to serve as a pivot. With the finishing nail held at the center of the stock, scribe the line, then cut out on the band or saber saw. File and sand the edge smooth.

Final sand all parts, then apply two or three coats of a good penetrating oil finish. Once dry, the top can be secured with 1¼ in. by no. 8 flat head wood screws as shown. 

Bill of Materials

Part	Description	Size	No. Req'd
A	Pedestal	3½ x 3½ x 17½	1
B	Leg	(see detail)	3
C	Cleat	¾ x 4¾ x 15	1
D	Top	21 dia. by ¾ thick	1





Wall Hung Display Cabinets

Favored curio pieces can be prominently displayed in this lovely wall-hung double cabinet. Ours is made from curly maple with a birch plywood back, but just about any wood can be used. Our plywood had an interesting bookmatched grain pattern, so we made a point to center it in the back of the large cabinet. A small detail, perhaps, but one that adds a great deal of interest to the piece.

Begin by making the large cabinet ends (parts A) and sides (parts B), and the small cabinet ends (parts J) and sides (parts K). If you don't have stock that's wide enough to provide the 6 in. and 8 in. widths that are needed, it will be necessary to edge-glue two or three narrower boards. Try to avoid edge-gluing though. No matter how good the joint is, the abrupt interruption of the grain line at the joint almost

always makes it show; and a piece like this looks best without any unnecessary distractions.

If you must edge-glue, look for straight-grain stock as the grain line break at the glue joint will be less apparent. Also, try to get the color of the wood to reasonably match. And, when cutting the stock, allow a little extra on both length and width. Later, after the clamps are removed, it can be trimmed

to final length and width on the table or radial-arm saw.

Perhaps most important to the success of the edge joint is a clean, smooth surface on both mating parts. This allows close contact between both edges and provides maximum glue strength. When the stock is ripped to width, the edge is usually fairly rough, so it's best to smooth it out with a hand plane or jointer. If you use a hand plane, be sure to cut in the direction of the grain, and do it in several light passes—don't try to do it in one pass. And keep in mind that it's important for the edge to be at right angles to the face of the board, so keep a square handy to check for this.

Apply a thin coat of glue to both mating surfaces, then clamp the stock together with several bar or pipe clamps. Avoid overtightening which can cause too much glue to squeeze out, resulting in a weakened joint.

After the glued-up stock has been ripped to final width, the dovetail grooves can be cut into the four sides (parts B and K). This is best done with a router equipped with a 1/2 in. dovetail bit and a pair of edge guides as shown in figure 1. Carefully lay out and mark the location of each groove, keeping in mind that the grooves stop short of the front edge (see figure 5 for the groove dimensions). Clamp one edge guide in place, located so that the router bit establishes one leg of the groove. Clamp the other edge guide on the opposite side and locate it so that it establishes the second leg and results in the 5/8 in. groove width. Be sure the edge guides are made from straight stock.

Now that the dovetail grooves have been made, the 1/4 in. wide by 3/4 in. deep rabbet can be cut on the back edge of parts A, B, J, and K. This rabbet, which serves to accept the back (parts D or M), is best cut using the dado-head cutter in conjunction with the table saw.

With the back rabbet cut, the miters can be cut on parts A, B, J, and K. Since these miters are exposed, it's important that they fit together tightly. This means that the saw blade must be exactly at 45 degrees—if it isn't, even a slight error will add up to a noticeable gap when the four joints are assembled later on. To check the angle for accuracy, it makes good sense to

first make a test square from scrap stock. Use elastic bands to hold the test square together while checking the fit. The joints should meet perfectly; if not, adjust the blade and try again. Once you are satisfied with the angle, parts A, B, J, and K can be cut to length.

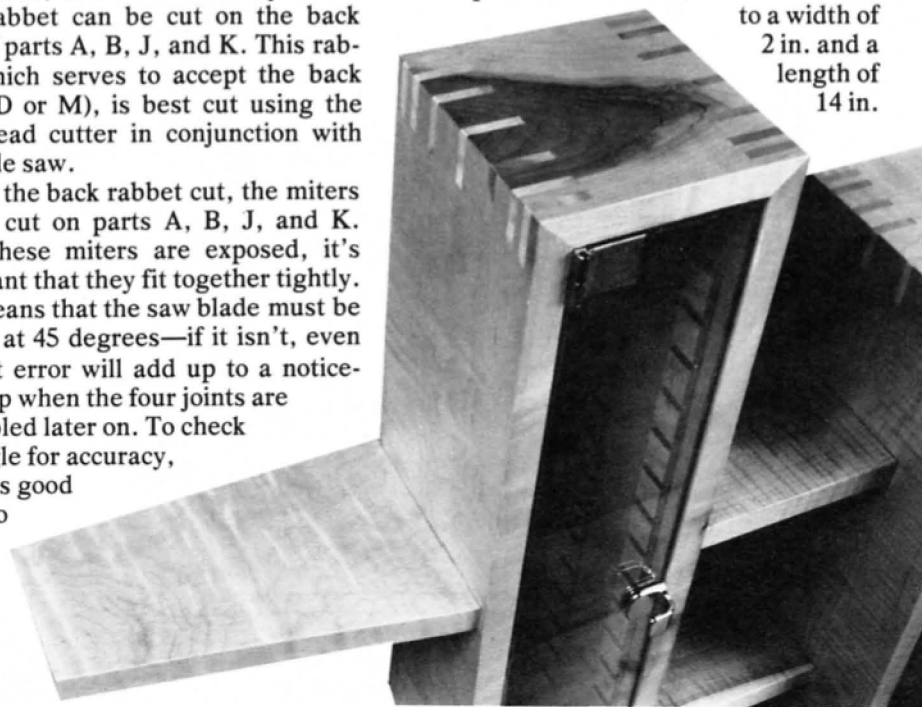
Readers will note that we made shelf supports (parts G or P) from 1/4 in. thick by 3/4 in. wide wood strips. Another commonly used method requires 1/4 in. diameter by 1/2 in. deep holes drilled to take 1/4 in. diameter by 1 in. long dowel pins. A pair of pins under each end of a shelf will hold it in place. Generally, a series of paired holes are drilled, each pair evenly spaced from top to bottom of the cabinet. If you choose this method to support the shelves, the holes must be drilled in parts B and K at this point in the construction.

sides (parts B), and the small cabinet ends (parts J) and sides (parts K) can now be assembled. Starting with the large cabinet, apply glue to the miters, then assemble and clamp with two or three web clamps. Make sure there is good contact at the miter joints. Also, be sure to check for squareness, and make adjustments as necessary. Allow to dry thoroughly. The small cabinet is assembled in the same manner.

With the cabinet sides and ends glued together, the splines can be added. From a strength standpoint, these splines are important since an end grain miter joint has limited strength.

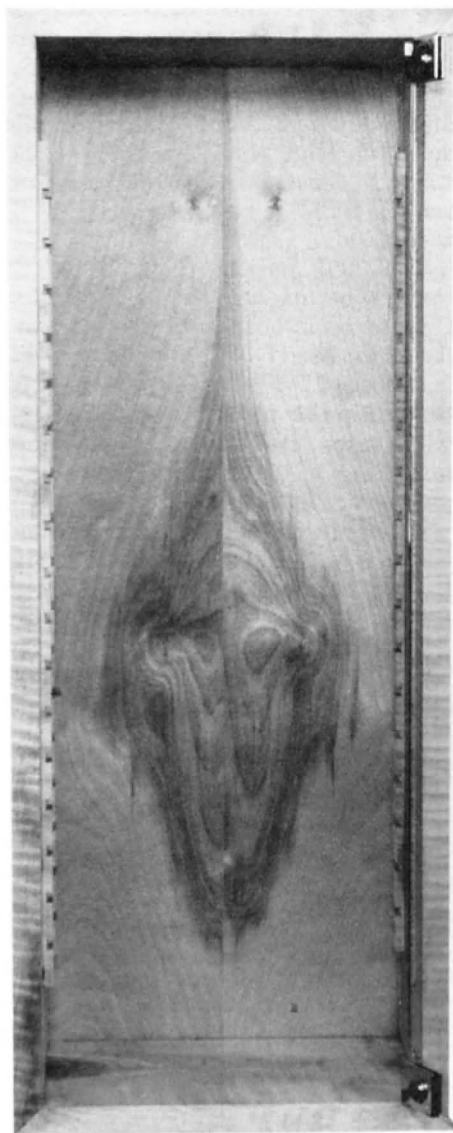
A simple table saw jig makes it easy to add the miters. To make the jig (see figure 2), cut a piece of 3/4 in. particle board to 10 in. by 12 in. Next, cut a piece of 5/4 stock (about 1 in. thick)

to a width of
2 in. and a
length of
14 in.



Miter each end to 45 degrees, then glue to the particle board as shown.

To use the jig, set the dado head to make a 1/4 in. wide by 7/8 in. deep cut, then position the jig against the rip



fence. Referring to figures 3 and 4, locate the fence to make the first miter cut, then with the cabinet held firmly in the jig, and the jig held firmly against the fence, pass the jig through the cutter. Repeat this for all four corners, then turn the cabinet and do the four corners on the opposite side. Now, relocate the fence and repeat the process. Continue until all spline grooves are cut on both cabinets.

Next, cut the 1/4 in. splines to fit snugly in the miters, then glue them in place. Make them slightly oversized so they can be trimmed flush with the surface of the cabinet. And for maximum strength, be sure to have the grain of the splines run at 45 degrees as shown.

The wings (parts E, F, N, and O) and dividers (parts S) are now cut to overall length and width. The dovetail (see figure 5) is cut using a router table

(continued on next page)

or shaper in conjunction with a 1/2 in. dovetail bit. Properly cut, there should be just enough clearance between the dovetail and the groove to allow a sliding fit. Once the dovetail is cut, the 1/2 in. step can be cut on the front corners as shown.

Give the two cabinets, the wings, and the divider a thorough sanding, finishing with 220 grit, then assemble the parts with glue. To insure tight joints, it's best to only assemble one or two joints at a time, adding clamps if necessary.

The shelf supports (parts G and P) can now be made as shown (figure 6). Use the dado-head cutter to crosscut the 1/8 in. deep by 1/4 in. wide grooves in a piece of 7 1/2 in. wide by 24 in. long stock. Rip the piece into eight 3/4 in. wide strips, then cut to length. Glue and clamp to the inside of the cabinet as shown.

After cutting the backs (parts D and M) to size, they can be glued to the back of the cabinets. Plate glass for the

doors and shelves can be purchased at any glass shop. For safety's sake, have the edges polished.

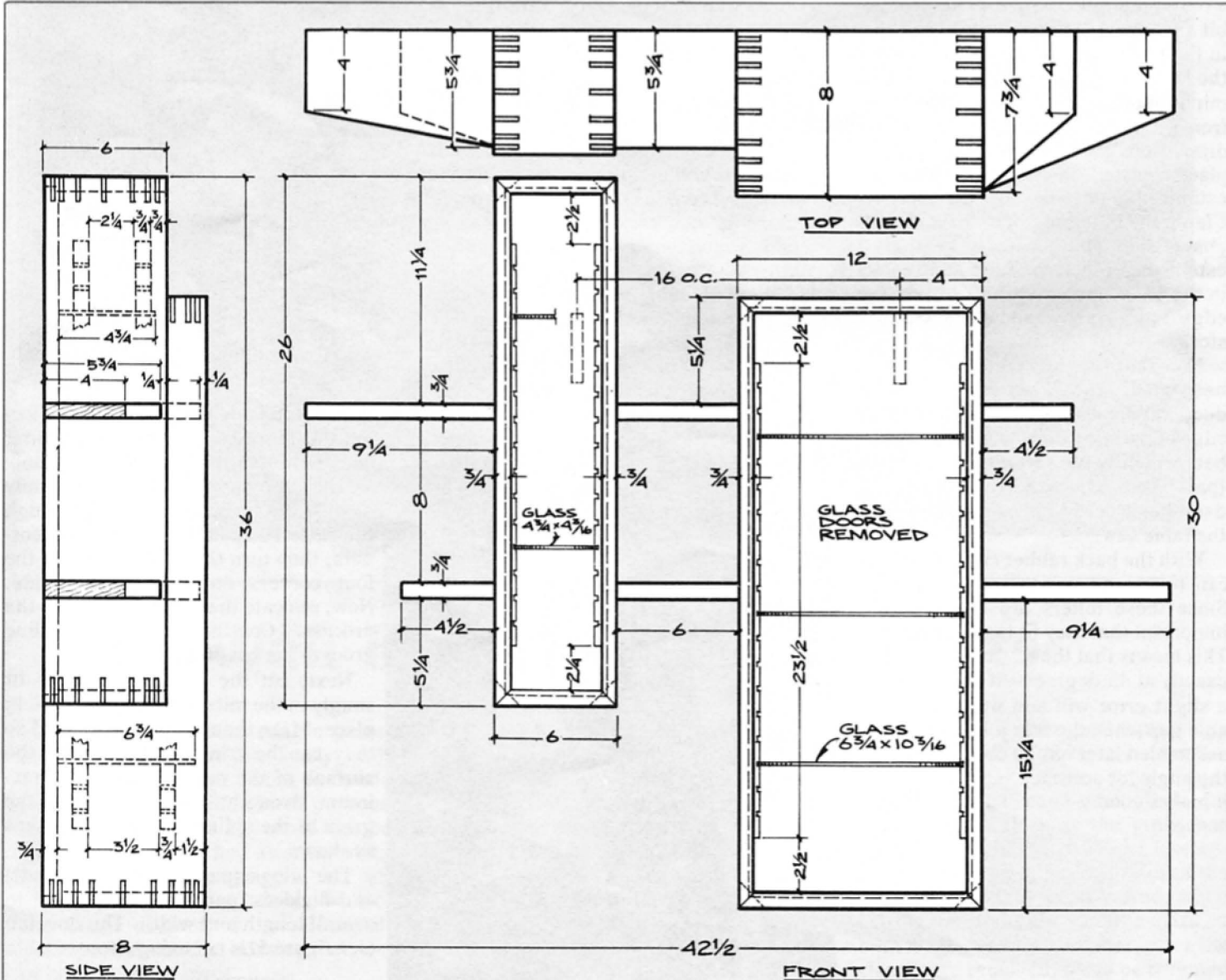
The glass door hinges (parts T) and pulls (parts U) can both be ordered from the mail order company Woodworker's Supply of New Mexico, 5604 Alameda N.E., Albuquerque, NM 87113. For the hinge, order part number 199-004 (\$9.95/pair). For the pull, order part number 191-003 (\$2.75/each). For a complete set of hinges and pulls for this project, add \$3.50 for shipping charges.

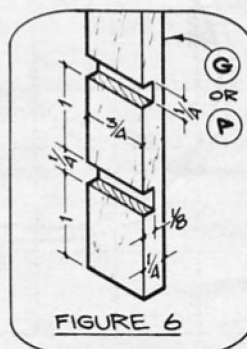
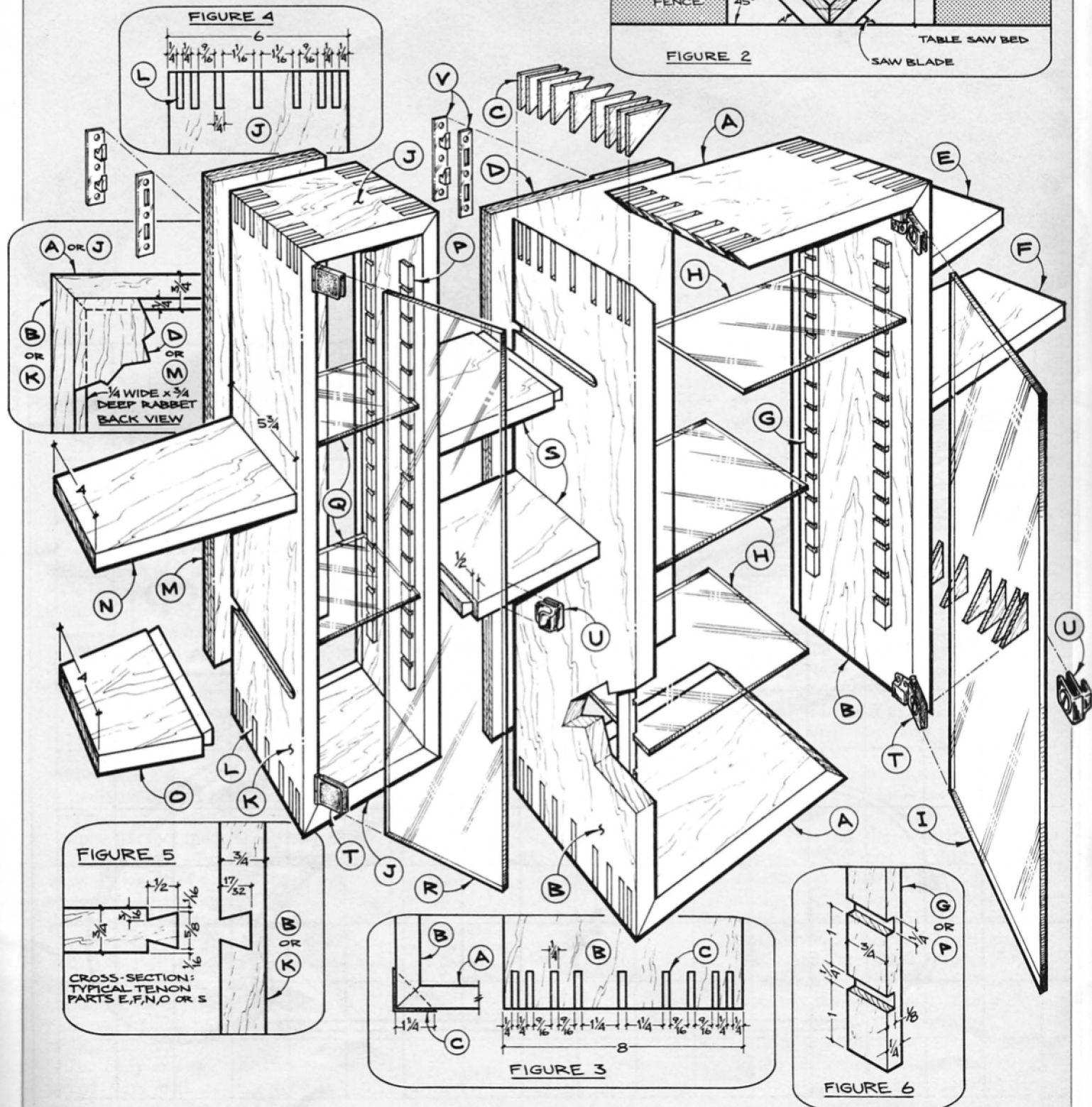
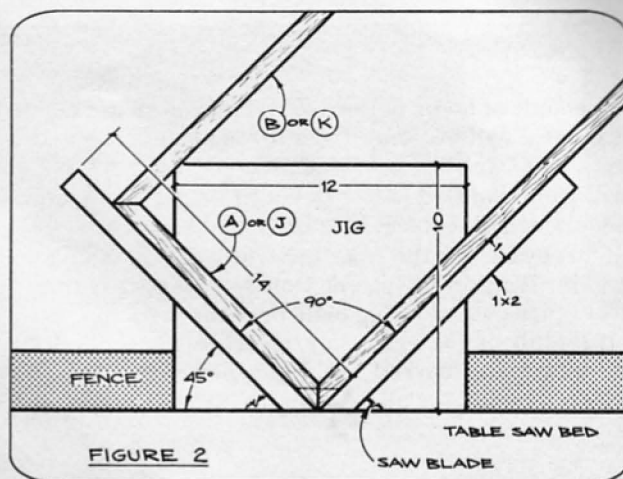
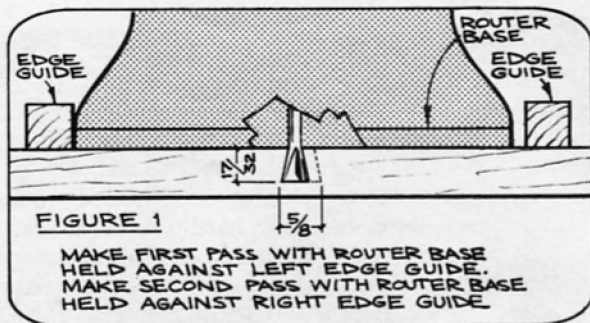
A pair of bed rail fasteners (available from The Wise Company, 6503 St. Claude Ave., Arabi, LA 70032) provides a sturdy way to hang the cabinets. The slotted half is mortised into the back.

Before installing the doors and shelves, give the entire project a thorough sanding, finishing with 220 grit. Round the edges only lightly. Three coats of a penetrating oil provide an attractive finish. The addition

Bill of Materials (All Dimensions Actual)			
Part	Description	Size	No. Req'd.
LARGE CABINET			
A	End	3/4 x 8 x 12	2
B	Side	3/4 x 8 x 30	2
C	Spline	1/4 x 1 1/4 x 1 1/4	36
D	Back	3/4 x 11 x 29	1
E	Top Wing	3/4 x 7 3/4 x 5 *	1
F	Bottom Wing	3/4 x 7 3/4 x 9 3/4 *	1
G	Shelf Support	1/4 x 3/4 x 23 1/2	2
H	Shelf	1/4 x 6 3/4 x 10-3/16	3
I	Door	1/4 x 10-5/16 x 28 3/4	1
SMALL CABINET			
J	End	3/4 x 6 x 6	2
K	Side	3/4 x 6 x 26	2
L	Spline	1/4 x 1 1/4 x 1 1/4	28
M	Back	3/4 x 5 x 25	1
N	Top Wing	3/4 x 5 3/4 x 9 3/4 *	1
O	Bottom Wing	3/4 x 5 3/4 x 5 *	1
P	Shelf Support	1/4 x 3/4 x 19 3/4	2
Q	Shelf	1/4 x 4 3/4 x 4-3/16	2
R	Door	1/4 x 4-5/16 x 24 3/4	1
S	Divider	3/4 x 5 3/4 x 7 *	2
T	Glass Door Hinge		4
U	Glass Door Pull		2
V	Bed Rail Fasteners	3/4 x 5	2 pr.
* Length dimension includes tenon(s).			

of the doors and shelves completes the project. WwJ





A couple of hours in the workshop is all that's needed to turn out a half-dozen of these sturdy hangers—and what household can't use a few more in each closet? We made ours from ¾ in. thick oak, but if made from aromatic cedar, the hangers will help keep moths at bay.

Start by cutting the stock to a width of 6 in. and a length of 17 in. Transfer the profile from the drawing to the stock, then cut out with a band or saber saw. Cut slightly on the waste side, then file and sand to the marked line.

Next, round over all

the edges to a ¼ in. radius. We did ours by hand, using a file and sandpaper, but a router or shaper equipped with a ¼ in. radius bit will save time and effort.

The "hook" can be made from 3/16 in. diameter steel or brass stock. Most hardware stores carry (or can order) this material. It can be bent rather easily using a pair of pliers to work the rod into the curved shape.

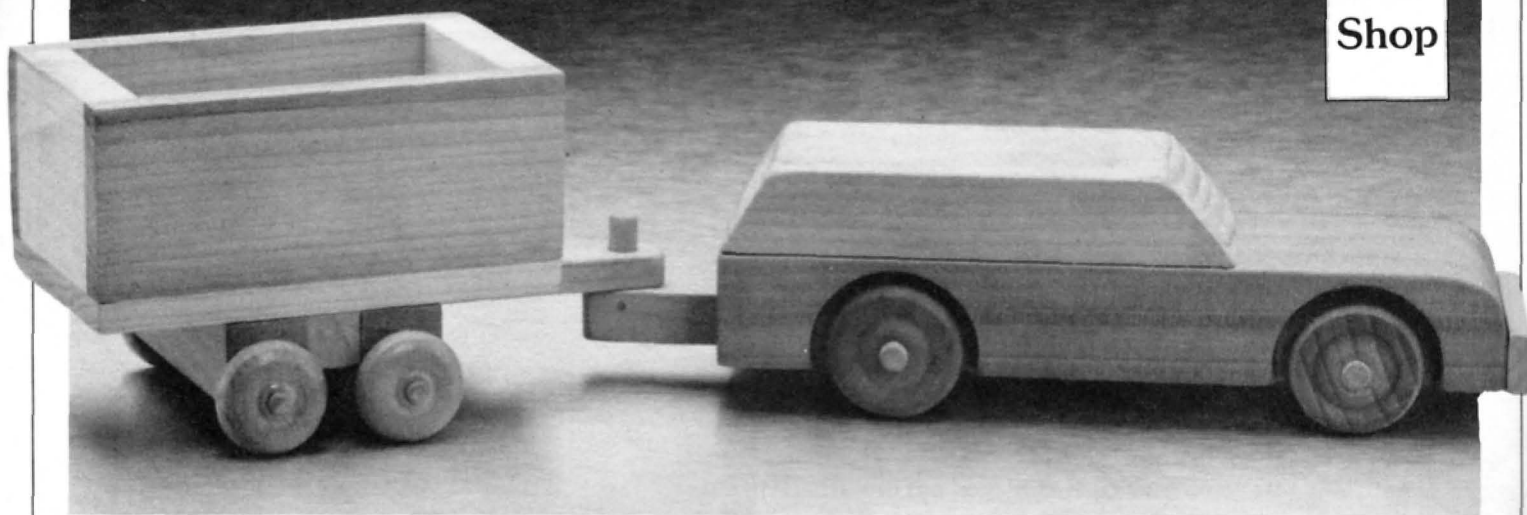
Bore a 3/16 in. diameter hole to a depth of 1½ in., then glue the hook in place using epoxy. Final sand the hanger before applying two coats of Watco Danish Oil.

Wvj

Wooden Coat Hanger

1 SQ = ½"

The
Gift
Shop



Toy Car and Trailer

by C. J. Maginley

A few hours in the workshop is all you'll need to build this nifty combination station wagon and trailer. Just about any wood can be used, even pine, but maple or birch will offer maximum durability.

The body (part A) can be made first. Cut five-quarter stock (which measures $1\frac{1}{2}$ in. thick) to a width of $2\frac{3}{8}$ in. and a length of 7 in. Note that a $\frac{1}{2}$ in. wide by $\frac{1}{2}$ in. deep groove is cut down the middle to accept the car hitch (part C). This groove can be cut using the dado-head cutter, or by making repeated passes with a regular saw blade. Also note the four $\frac{3}{8}$ in. deep by $1\frac{1}{2}$ in. diameter wheel well holes. Lay out and mark the location of these holes, then use a Forstner or spade bit to bore each one. Following this, use a $5/16$ diameter drill bit to bore the two axle holes as shown.

Next, the roof (part B) can be made. Cut $3/4$ in. thick stock to a width of $2\frac{1}{4}$ in. and a length of $4\frac{1}{2}$ in. Set the table saw blade to an angle of 34 degrees, then, holding the stock against the miter gauge, cut the bevel on each end. The side edges of the roof also have a slight taper. Mark the angle of the taper on each end of the stock, then use a sharp hand plane to cut to the marked line.

The body and the roof can now be joined. Give both parts a good sanding, then apply glue to the mating surfaces and clamp firmly. Before adding

the glue though, it's a good idea to drive two or three small brads into the underside of the roof, then clip the heads off so that about $1/16$ in. is exposed. The brads will keep the parts from sliding over each other when clamp pressure is added. When dry, remove the clamps and clean up any excess glue squeeze-out with a sharp chisel.

Now, the car hitch (part C) and the bumper (part D) can be cut to the dimensions shown and glued into place. The car hitch should fit snugly in the groove cut in the body.

The wheels (parts E) can be lathe-turned to the dimensions shown or, if you prefer, they can be purchased from The Toymaker Supply Co., 2907 Lake Forest Road, Tahoe City, CA 95730. A package of 36 wheels costs

\$4.50 (order part no. W1636). Apply a thin coat of glue to the inside of the wheel hole and also to the end of each axle (parts F), then assemble as shown.

Part G, the coupler, is made from $1/4$ in. diameter dowel stock cut to a length of $7/8$ in. It's glued into a $3/8$ in. deep hole drilled in part C. A locking pin (part H) is cut from $1/16$ in. diameter dowel stock and glued into a hole bored through part C and into part G as shown.

Next, the bottom (part I), the two sides (parts J), and the two ends (parts K) are cut to size and sanded smooth. Assemble parts J to K with glue and clamps; when dry, add part I in the same manner.

As shown on the drawing, the trailer wheel assembly consists of the two axle holders (parts M), the spacer (part N), and the two trailer axles (parts P). Cut parts M and N to the dimensions shown, then glue and clamp together. A $1/4$ in. drill bit is used to bore the two axle holes. The trailer wheels (parts O) can also be purchased from The Toymaker Supply Co. A package of 40 wheels costs \$3.50 (order part no. W1540). Use glue to join the wheels to the axles.

Final sand all parts, taking care to round all sharp corners and edges. Make sure all parts are securely fastened. No final finish is necessary. 

(continued on next page)

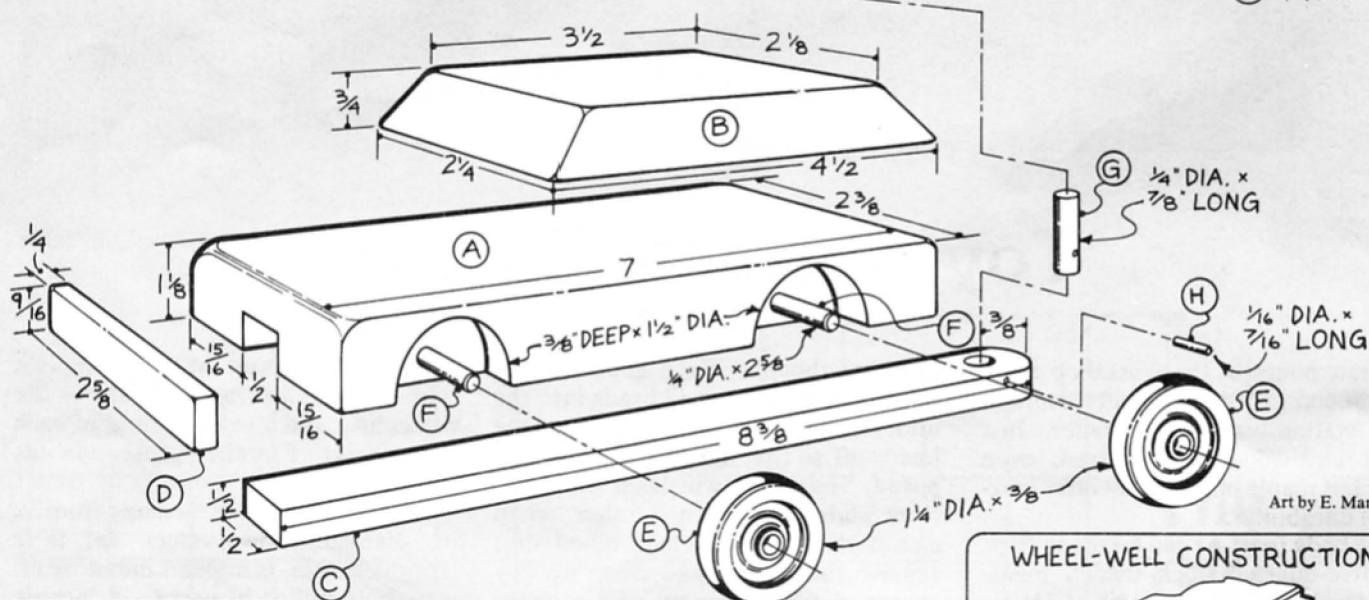
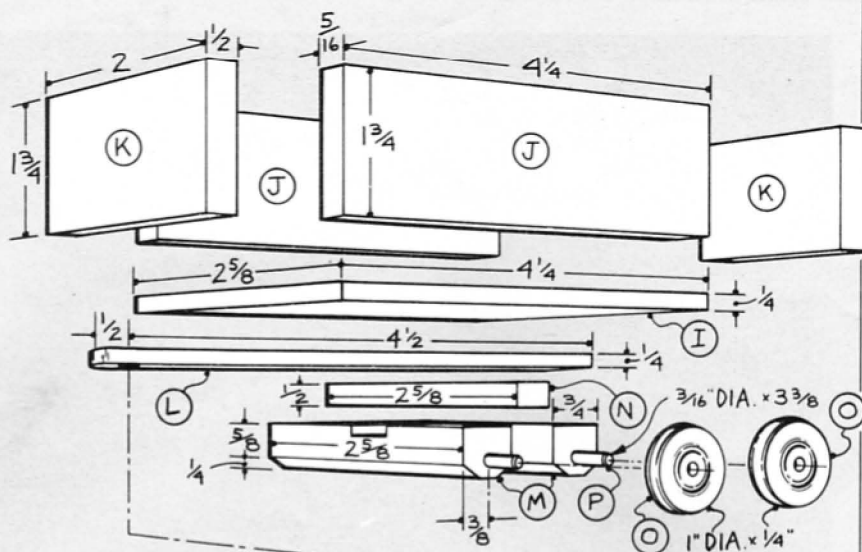
Bill of Materials (All Dimensions Actual)			
Part	Description	Size	No. Req'd.
A	Body	$1\frac{1}{2} \times 2\frac{3}{8} \times 7$	1
B	Roof	$\frac{3}{4} \times 2\frac{1}{4} \times 4\frac{1}{2}$	1
C	Car Hitch	$\frac{1}{2} \times \frac{1}{2} \times 8\frac{3}{4}$	1
D	Bumper	$\frac{1}{4} \times 9/16 \times 2\frac{1}{2}$	1
E	Car Wheel	$1\frac{1}{4}$ dia. x $\frac{3}{8}$ thick	4
F	Car Axle	$\frac{1}{4}$ dia. x $2\frac{1}{2}$ long	2
G	Coupler	$\frac{1}{4}$ dia. x $\frac{7}{8}$ long	1
H	Pin	$1/16$ dia. x $7/16$ long	1
I	Bottom	$\frac{1}{4} \times 2\frac{1}{2} \times 4\frac{1}{4}$	1
J	Side	$5/16 \times 1\frac{3}{4} \times 4\frac{1}{4}$	2
K	End	$\frac{1}{2} \times 1\frac{1}{4} \times 2$	2
L	Trailer Hitch	$\frac{1}{4} \times \frac{1}{2} \times 4\frac{1}{2}$	1
M	Axle Holder	(See Detail)	2
N	Spacer	(See Detail)	1
O	Trailer Wheel	1 dia. x $\frac{1}{4}$ thick	4
P	Trailer Axle	$3/16$ dia. x $3\frac{3}{8}$ long	2

TRAILER WHEEL ASSEMBLY

MORTISE EACH PIECE
 $\frac{1}{4}$ " DEEP $\times$ $\frac{1}{2}$ " WIDE

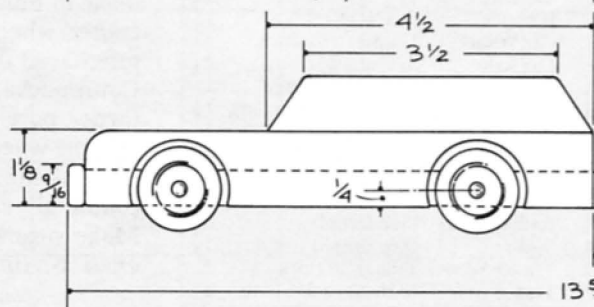
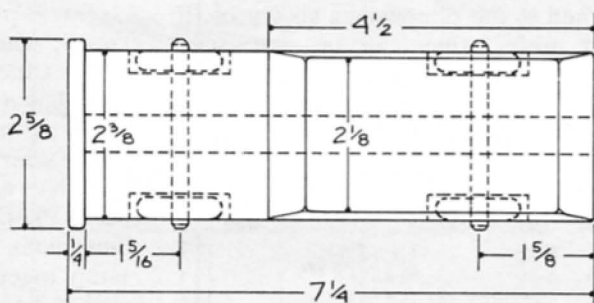
Dimensions:
 - Top piece: $\frac{3}{4}$ " wide, $\frac{1}{2}$ " high
 - Middle piece: $\frac{3}{4}$ " wide, $\frac{1}{2}$ " high
 - Bottom piece: $2\frac{5}{8}$ " long, $\frac{3}{4}$ " high
 - Axle: $\frac{3}{8}$ " diameter, extends $\frac{3}{8}$ "
 - Spacers: $\frac{5}{8}$ " and $\frac{3}{8}$ " thick
 - Mortise: $\frac{1}{4}$ " deep $\times$ $\frac{1}{2}$ " wide
 - Part labels: M, N, P

-AXLE EXTENDS $\frac{3}{8}$ "

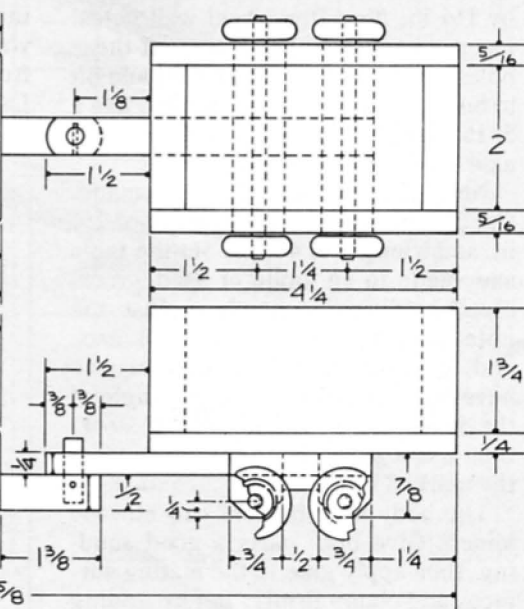


Art by E. Marino III

Diagram of the bottom view of a car body. The overall width is 7. The overall length is 2 $\frac{3}{8}$. There are two vertical grooves, each 1 $\frac{1}{2}$ wide. The distance between the inner edges of the grooves is 1 $\frac{5}{8}$. The distance from the outer edge to the inner edge of the left groove is 1 $\frac{5}{16}$. The distance from the outer edge to the inner edge of the right groove is 1 $\frac{5}{8}$. A curved arrow points to the right groove, which is labeled $\frac{1}{2} \times \frac{1}{2}$ GROOVE. The distance from the right edge to the inner edge of the right groove is 1 $\frac{3}{8}$.



-1 1/2" DIA. x
3/8" DEEP



Paper Towel Holder

by Thomas L. Peters

The Gift Shop



The standard paper towel holder is an uninspired piece of plastic that is normally attached to a wall. It can hardly be considered portable or suitable for use on the dinner table. Tearing off the towels usually turns into a two-handed process as too often the energetic one-handed approach results in the entire roll popping out and ending up in a sink full of dishwater or all over the kitchen floor.

This attractive paper towel holder, in addition to overcoming these problems, will fit in well with both kitchen and dining room decors. I used oak for all parts. If you can't get oak dowel stock locally, it can be ordered from the company Odd Ball Supply, P.O. Box 133, North Attleboro, MA 02761.

Begin construction by edge gluing sufficient $\frac{3}{4}$ in. thick stock so that two $9\frac{3}{4}$ in. diameter circles (parts A and B) and one 7 in. diameter circle (part F) can be obtained. Use a

compass to scribe each circle, then cut out using a band saw or jig saw. Temporarily join parts A and B with double-faced tape and true up the edges using a disc sander.

With parts A and B still joined with tape, draw a concentric 8 in. diameter circle on what will be the bottom of part A, then divide the circle into 6 equal arcs. This can easily be done by setting a pair of dividers to the radius distance (4 in.) and, starting at the diameter line intersection, "walking" the dividers around the circle.

At five of the six points, drill $\frac{1}{2}$ in. diameter holes $1\frac{1}{2}$ in. in depth. A drill press should be used to insure that the holes are all perpendicular to the flat surface of the wood. These holes will extend through part A and $\frac{3}{8}$ in. into part B. At the sixth point put a mark $\frac{1}{4}$ in. to each side of the point on the scribed circle. At these marks, drill $\frac{3}{8}$ in. diameter holes $1\frac{1}{2}$ in. deep.

Parts A and B can now be separated. On part B, draw a concentric $6\frac{3}{8}$ in. diameter circle, then cut out using either a jig saw or a drill press equipped with a circle cutter. In either case, be sure to cut on the inside of the line so that the hole can later be sanded to exactly $6\frac{3}{8}$ in. diameter.

Next, true the edges of part F, then rout out a $\frac{1}{4}$ in. deep by $\frac{3}{8}$ in. wide rabbet around the bottom of the lid so it will fit into the hole in part B. Round over the top edge of parts A, B, and F using a piloted $\frac{1}{4}$ in. rounding bit in a router. Thoroughly sand all edges and surfaces of the three parts.

Attach part E to the center of the base and part G to the center of the lid. Part E can be anchored by means of a woodscrew through the bottom. For the lid, it is best to drill a $\frac{1}{4}$ in. diameter hole through the lid and $\frac{3}{4}$ in. into part G. A $\frac{1}{4}$ in. diameter dowel (part H) through the lid and glued into the top pin provides a strong attachment and allows the addition of a knob (part I) to the lid using the same dowel. The knob can be purchased at your local hardware store or turned on the lathe.

The last step is to cut five $\frac{1}{2}$ in. diameter dowels (part C) and two $\frac{3}{8}$ in. diameter dowels (part D), each $12\frac{1}{2}$ in. long. Glue the dowels into the base disc making sure they are flush with the bottom. Add a drop of glue to the top of each dowel and add part B. At all times, use the glue sparingly so it doesn't drip onto exposed surfaces. If it does, clean it up with a damp cloth immediately or the stain finish will be affected.

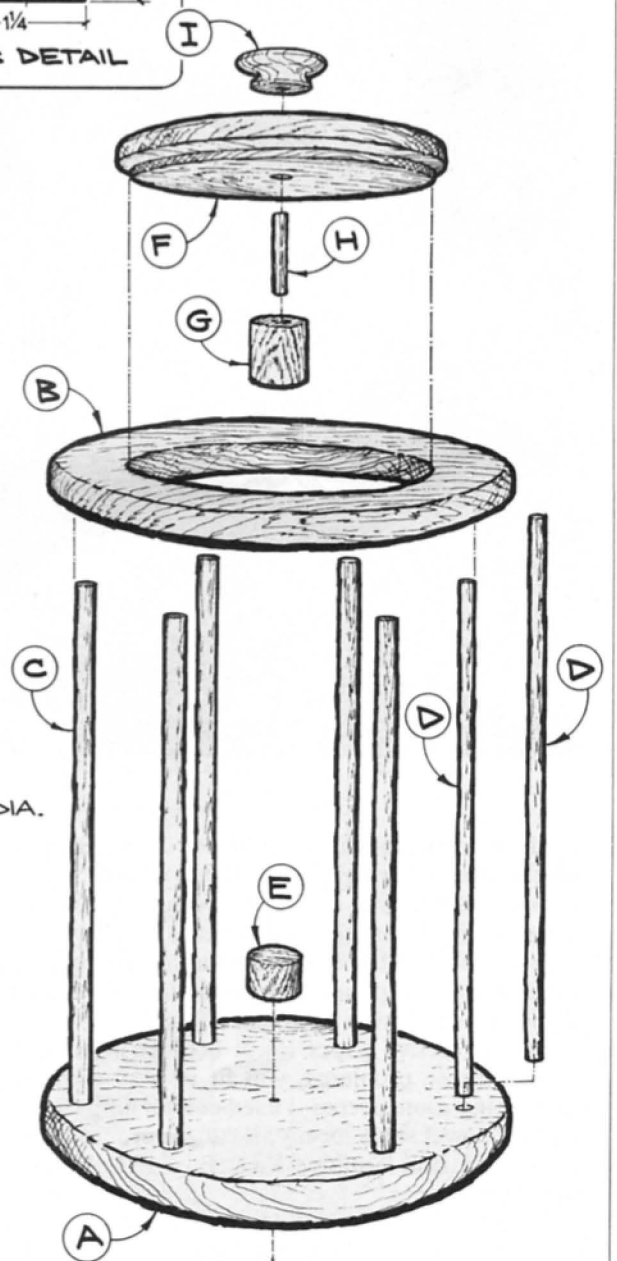
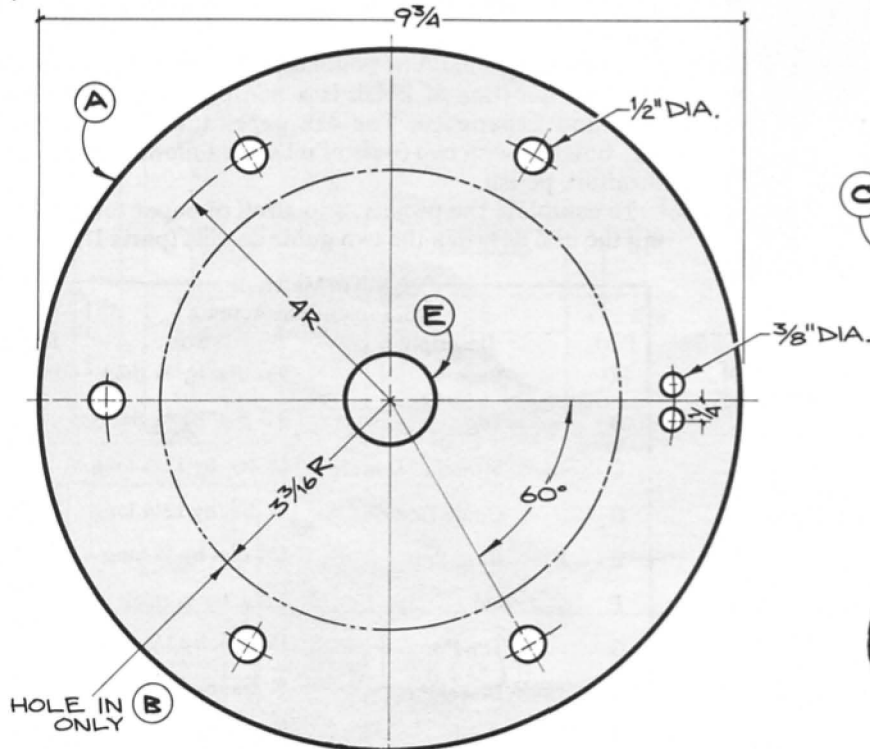
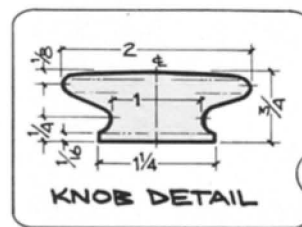
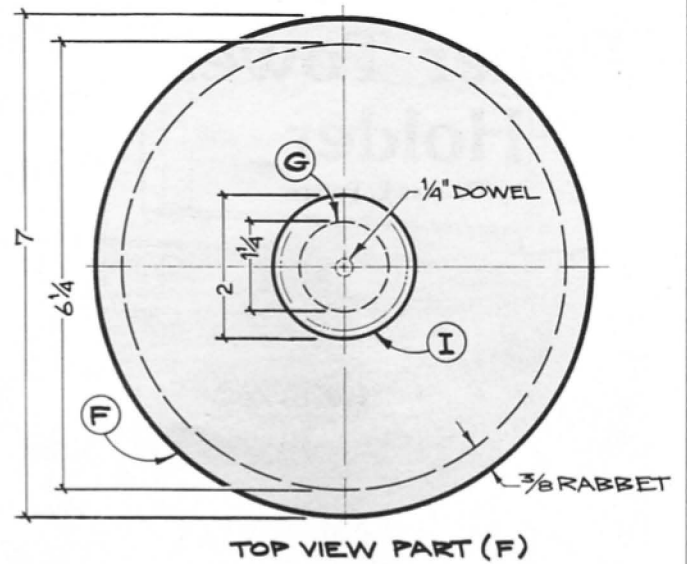
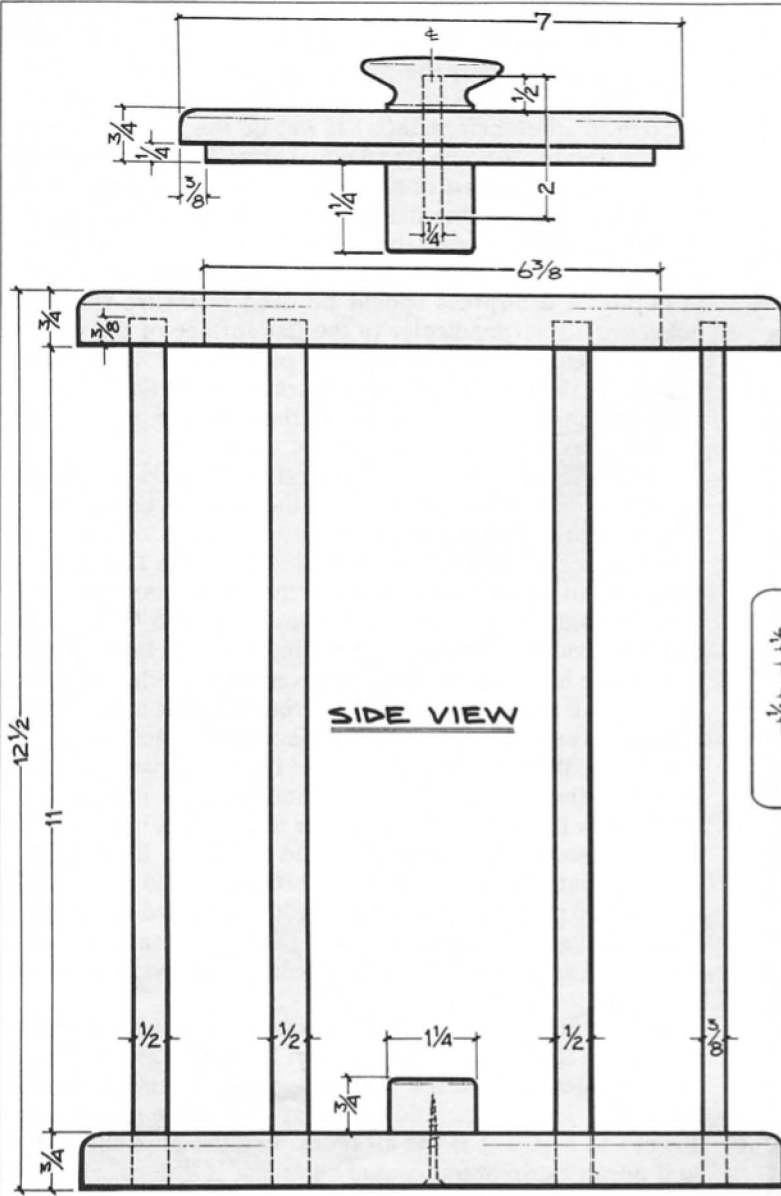
All sanding should be completed before the final assembly. The question of finish is a matter of personal preference and experience. The oak paper towel holder shown was finished with two coats of oil stain followed by a coat of furniture polish.

To complete the project, add a roll of paper towels, feeding the end between the two guide dowels (parts D). W&J

Bill of Materials

(All Dimensions Actual)			
Part	Description	Size	No. Req'd
A	Base	$9\frac{3}{4}$ dia. by $\frac{3}{4}$ thick	1
B	Top	$9\frac{3}{4}$ dia. by $\frac{3}{4}$ thick	1
C	Stretcher Dowels	$\frac{1}{2}$ dia. by $12\frac{1}{2}$ long	5
D	Guide Dowels	$\frac{3}{8}$ dia. by $12\frac{1}{2}$ long	2
E	Base Pin	$1\frac{1}{4}$ dia. by $\frac{3}{4}$ long	1
F	Lid	7 dia. by $\frac{3}{4}$ thick	1
G	Top Pin	$1\frac{1}{4}$ dia. by $1\frac{1}{4}$ long	1
H	Dowel Pin	$\frac{1}{4}$ dia. by 2 long	1
I	Knob	See Detail	1

(continued on next page)



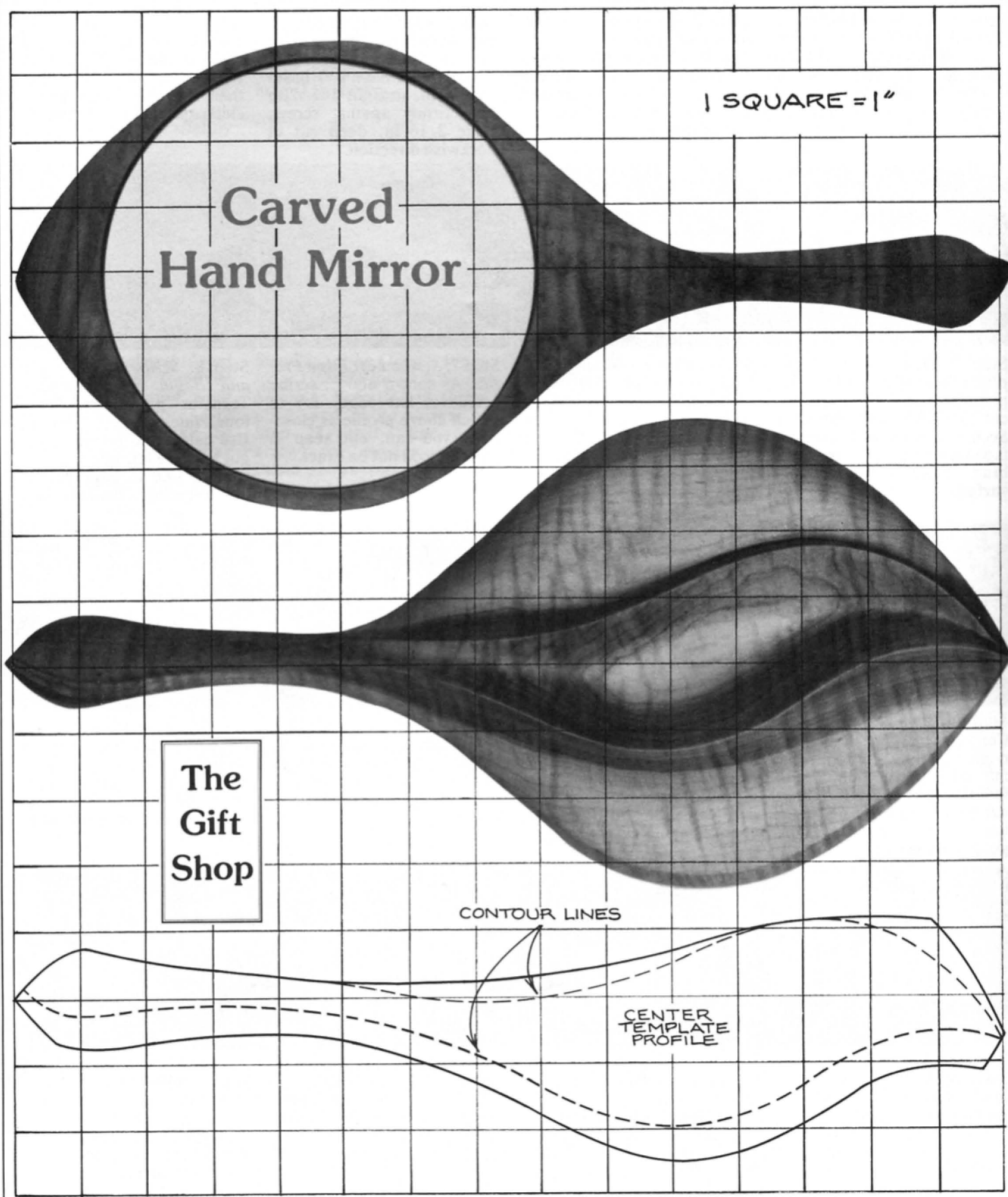
Graceful curves and crisp undulating lines are combined to create this especially attractive hand mirror—one that will make a much appreciated gift for someone special. It's surprisingly easy to make, in fact, we think even beginning carvers will find it an enjoyable undertaking. And to save time and energy, we've worked out a method that uses the router to remove a considerable amount of waste stock.

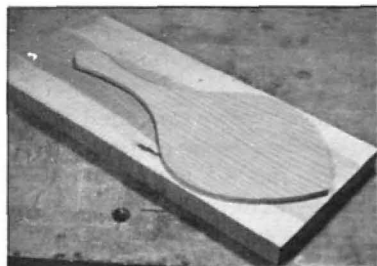
For stock we selected 1 in. thick curly maple, a close-

grained wood that carves well. Mahogany and cherry are other good choices. Oak can also be used, although it has a tendency to splinter.

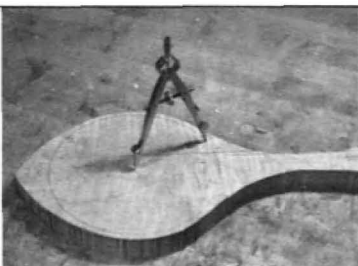
To detail the construction process, we've included 32 step-by-step photographs that take you from cutting the stock to applying the final finish. We made a total of three mirrors, with the last one taking only about six hours from start to finish.

(continued on next page)

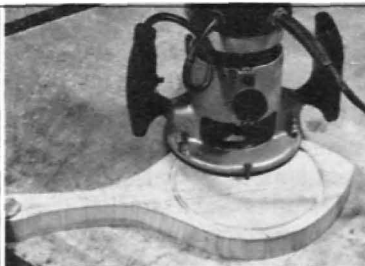




Step 1: Cut Stock To Shape: Transfer profile to $\frac{1}{4}$ in. plywood, then cut out and sand smooth. Lay template on $1 \times 8 \times 16$ stock, then scribe profile. Cut out with saber saw.



Step 2: Locate Mirror Cut-out: Use compass to scribe $6\frac{1}{2}$ in. circle. Circle should be centered along width and its center should be located at a point $4\frac{1}{2}$ in. from top end of mirror.



Step 3: Rout Outside of Cut-out: At the center of circle, set #10 screw, then equip router (must have $6\frac{1}{2}$ base) with $\frac{1}{4}$ in. straight bit. With base firmly against screw, make $\frac{3}{16}$ in. deep cut in clockwise direction.



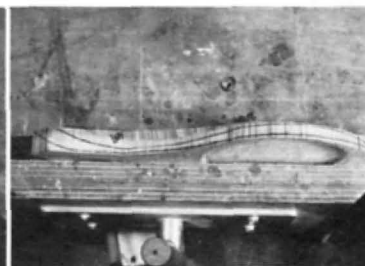
Step 4: Remove Waste: Replace $\frac{1}{4}$ bit with $\frac{1}{2}$ or $\frac{3}{4}$ bit. Keep depth of cut at $\frac{3}{16}$. Remove screw from center, then use router freehand to clean up remaining waste.



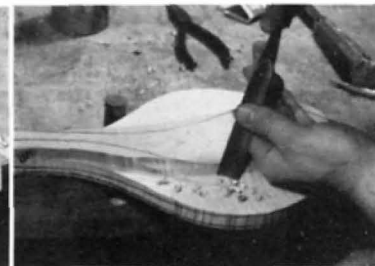
Step 5: Make Center Template: Transfer center template profile to $\frac{1}{4}$ plywood, cut out and sand smooth. Secure to stock with double-face tape or by driving three brads flush with template surface.



Step 6: Remove Waste Stock: Equip router with $\frac{7}{16}$ template guide bushing and $\frac{1}{4}$ straight bit set for $\frac{5}{8}$ deep cut. Make initial cut with bushing held firmly against template, then clean up remaining stock freehand.



Step 7: Scribe Left Edge Profile: As shown above, scribe profile of left edge. Try to match above profile as closely as you can, but keep in mind it need not be exact.



Step 8: Scribe Back Profile and Begin Edge Carving: Transfer profile of "contour" lines (pg. 39) to stock. Use half-round gouge to begin to carve left edge. Shape contour line to edge profile line, creating a concave surface in the process.



Step 9: Shape Left Edge: Continue working along left edge, shaping contour line into edge profile line. Don't feel it's mandatory to follow our profile exactly. Let your hands, eyes, and the wood guide your gouge.



Step 10: Shape Left Edge Handle: Concave profile is continued to about $1\frac{1}{4}$ in. from end of handle. Note radius of concave profile is not constant but that it changes along mirror's edge.



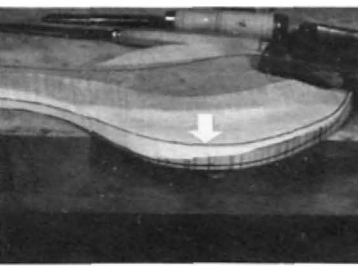
Step 11: Switch to Smaller Gouge: As the radius of the concave profile becomes smaller, switch to a smaller gouge (we used a no. 5 x 10 mm).



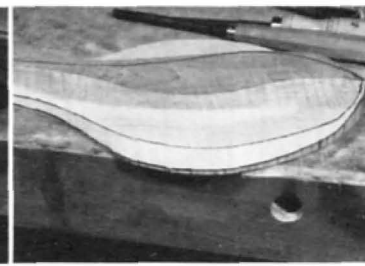
Step 12: Round Over Handle End: At handle end, stock is rounded with a cabinet-maker's file, forming a convex profile that joins the contour line and the left edge profile line.



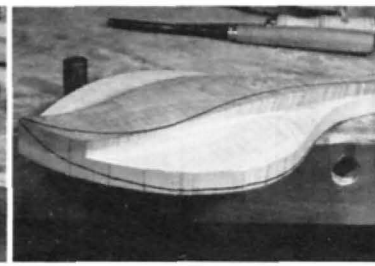
Step 13: Rounding Over Completed: Left edge of handle has been completely rounded over.



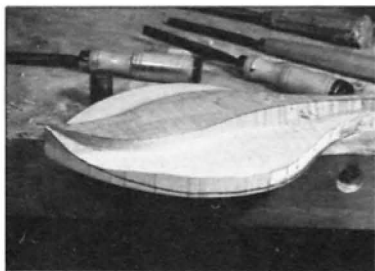
Step 14: Scribe Line for Left Edge Outside Bevel & Begin Shaping: Referring to above photo and photo shown in Step 15, scribe line (see arrow) for outside bevel. Photo shows the bevel partially shaped.



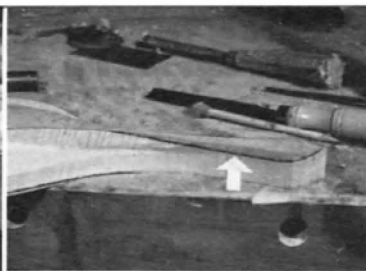
Step 15: Bevel Shaping Completed: Continue shaping outside bevel by connecting two profile lines as shown. Bevel looks best if it has a slight convex profile.



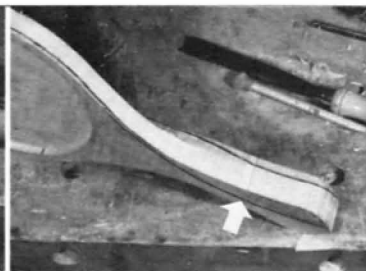
Step 16: Scribe Right Edge Profile: Referring to above photo and photos shown in Steps 17 & 18, scribe right edge profile as shown. Keep in mind that the profile need not match ours exactly.



Step 17: Shape Right Edge of Top End (Tip): Using large (no. 7 x 18 mm) gouge, begin to shape top end on right side. For a distance of about 2 in. (measured from tip), contour line is slightly undercut.



Step 18: Scribe Right Edge Handle Profile: Referring to above photo, scribe right edge handle profile (see arrow) as shown.



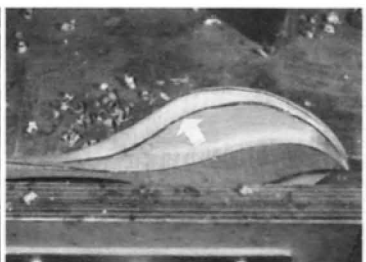
Step 19: Scribe Front Handle Profile: Referring to above photo, scribe handle profile (see arrow) on front of mirror as shown.



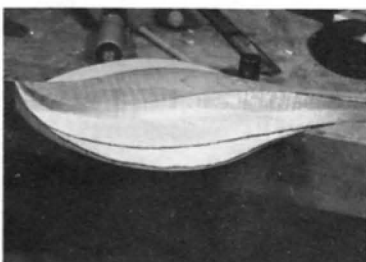
Step 20: Begin Carving Front Handle Profile: Starting at point where right edge handle profile intersects back, begin to shape front of handle. Use large gouge and file to shape stock.



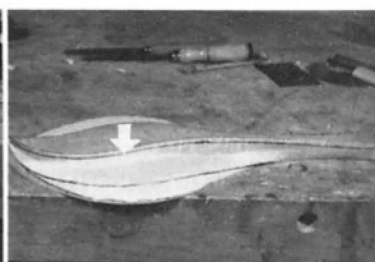
Step 21: Completed Front Handle Profile: Continue carving from starting point shown in Step 20 to end of handle. Profile should be slightly convex at starting point, then gradually change to slightly concave at handle end.



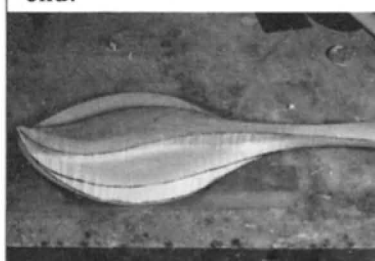
Step 22: Scribe Line for Right Edge Outside Bevel & Begin Shaping: Referring to above photo and photo shown in Step 23, scribe line (see arrow) for outside bevel. Photo shows some of bevel starting to be shaped with straight chisel.



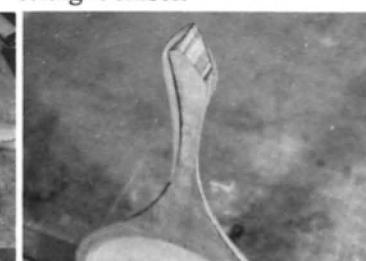
Step 23: Bevel Shaping Completed: Continue shaping outside bevel by connecting the two profile lines as shown. Bevel should have a slight convex profile.



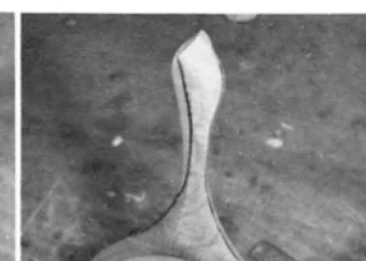
Step 24: Scribe Right Edge Contour Line: Referring to above photo, scribe line (see arrow) for right edge contour.



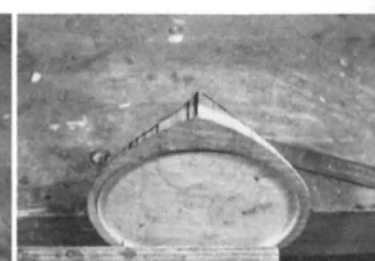
Step 25: Shape Contour Lines: Using large gouge and a file, shape area between contour line added in Step 24, and contour line added in Step 8.



Step 26: Front of Handle Ready for Shaping: Clamp mirror in vise so that front of handle can be shaped.



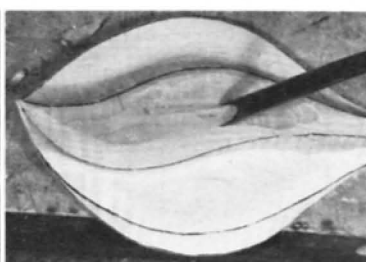
Step 27: Shape Handle: Use file to round over front of handle as shown.



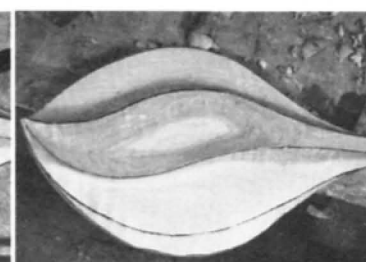
Step 28: Shape Tip: Use block plane to remove most of the stock from mirror tip. Once general shape is roughed out, use file to smooth out.



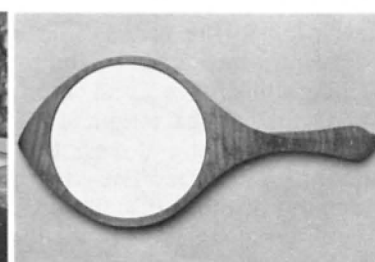
Step 29: Completed Tip: After planing and filing, tip tapers nicely from front to back.



Step 30: Hollow Out Back: Area between contour lines on back is hollowed out with gouge to form a cove. Ours measures about $\frac{1}{2}$ in. below line at deepest point. Slope cove so that it forms a crisp edge at contour line.



Step 31: Completed Cove: The cove carving is completed. Note that cove becomes a slightly convex surface as it approaches area of the handle.



Step 32: Finish and Install Mirror: Scrape and sand entire mirror. Final sand to 220 grit, then apply several coats of good penetrating oil. Have glass shop cut mirror to fit, then glue in place with silicone sealant.



Writing Desk

by R. B. Rennaker

This writing desk will make a handsome addition to just about any room in the house. The one shown is made of cherry, a logical choice for a piece like this, but mahogany or walnut would also look good.

The four legs (parts A) can be made first. Cut the 1 3/4 in. square stock to a length of about 30 in., then lathe-turn each leg to the profile shown on the drawing. Once turned, sand to 220 grit while still on the lathe, then remove and trim to a final length of 28 1/4 in.

Next, lay out and mark the location of the various mortises in each leg, keeping in mind that all mortises are centered along the 1 3/4 in. leg width. Note that the top mortises measure 1/2 in. wide by 4 3/8 in. long by 1 in. deep while the bottom mortises measure 1/2 in. wide by 1 1/4 in. long by 1 in. deep. When making the mortises, you'll find that most of the waste stock can be removed by making a series of holes using a 1/2 in. diameter drill bit. When

drilling, though, be sure to keep the bit square to the edge so that later, when the desk is assembled, the tenons will fit snugly in the mortises. After the holes are drilled, the remaining waste stock can be cleaned up with a sharp chisel.

The two side aprons (parts B) and the back apron (part C) can be made

next. The tenons can best be cut using the table saw equipped with a dado-head cutter, although repeated passes with a regular saw blade will also do the job. Carefully lay out and mark each tenon, then raise the dado-head cutter or saw blade to a height of 1/8 in. Now, using the miter gauge, pass the stock (5 in. wide side down) over the cutter to establish the 1 in. tenon length. You'll need a second pass to clean up the remaining material; several more passes will be needed if a regular saw blade is used.

Next, flip the stock over and repeat the process on the other side, then check for a good fit-up in the leg mortise. Keep in mind that the tenon thickness is regulated by the height of cutter or saw blade. Following this, the 1/8 in. step is cut on the bottom edge, then the cutter height is raised to 1/2 in. to cut the 1/2 in. step on the top edge.

The lower drawer opening, consisting of parts D, E, and F, is made next. Begin by cutting stock to size. From 3/4 in. thick stock, cut parts D to 1 in. wide by 35 in. long; cut parts E to 3 in. wide by 3 1/2 in. long; and cut part F to 3 in. wide by 2 in. long. Next, edge-glue part F at the centerpoint (measured along the length) of part D. When dry, measure 13 in. in each direction (see drawing), then edge-glue parts E in place. Allow to dry, then trim each part E to 3 in. long, resulting in an overall length of 34 in. for parts D. Following this, cut the tenon on each end following the same procedure used to cut parts B and C.

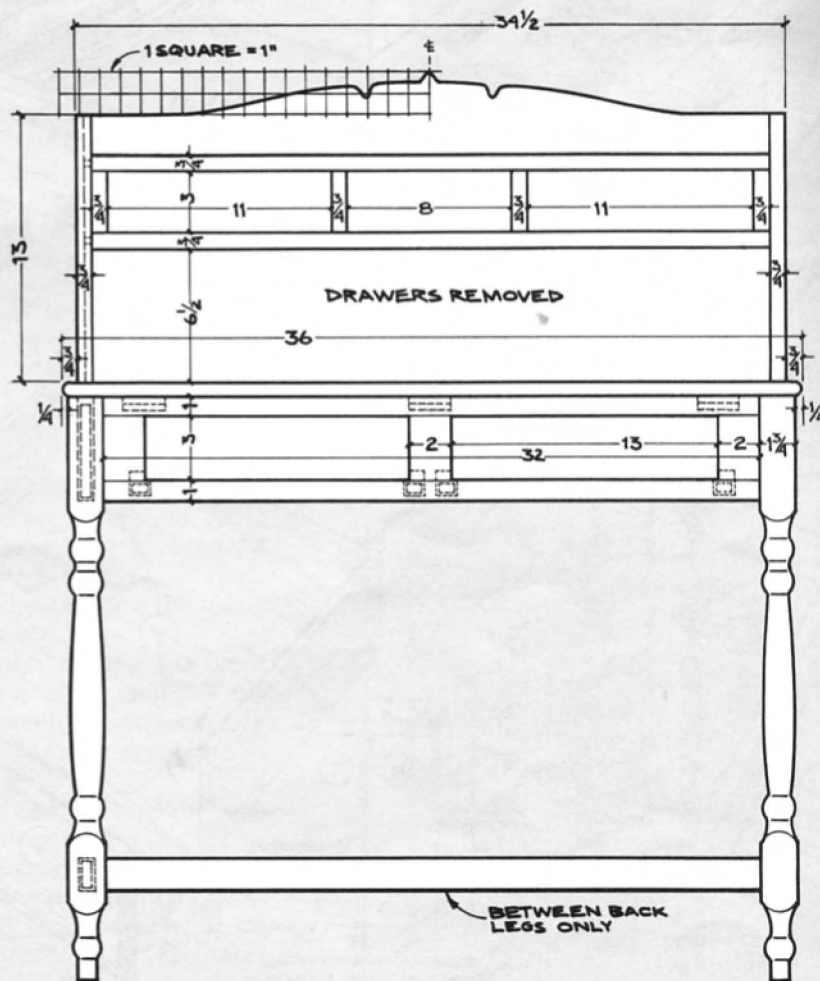
Parts J, the two side stretchers, and part K, the back stretcher, are made next. From 3/4 in. thick by 1 1/2 in. wide stock, cut part J to 16 3/4 in. and part K to 34 in. Once again, the dado-head cutter is used to cut the tenons, only this time the cutter height is set to 1/4 in. for all cuts.

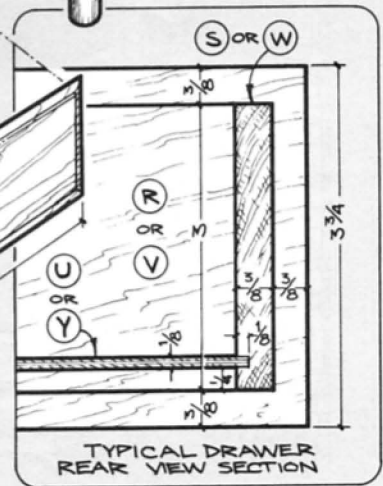
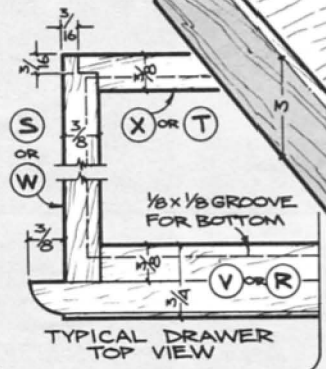
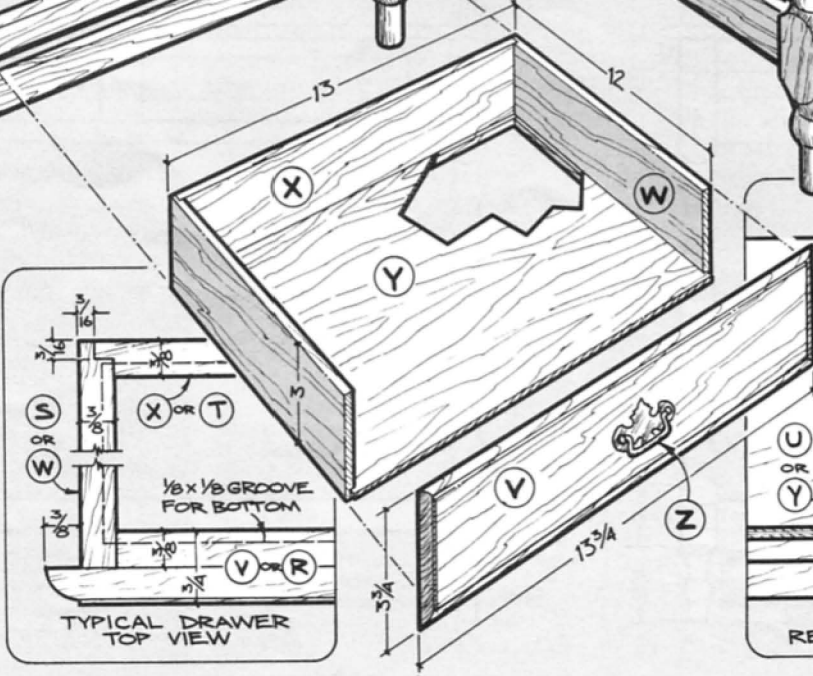
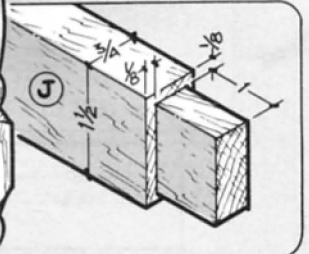
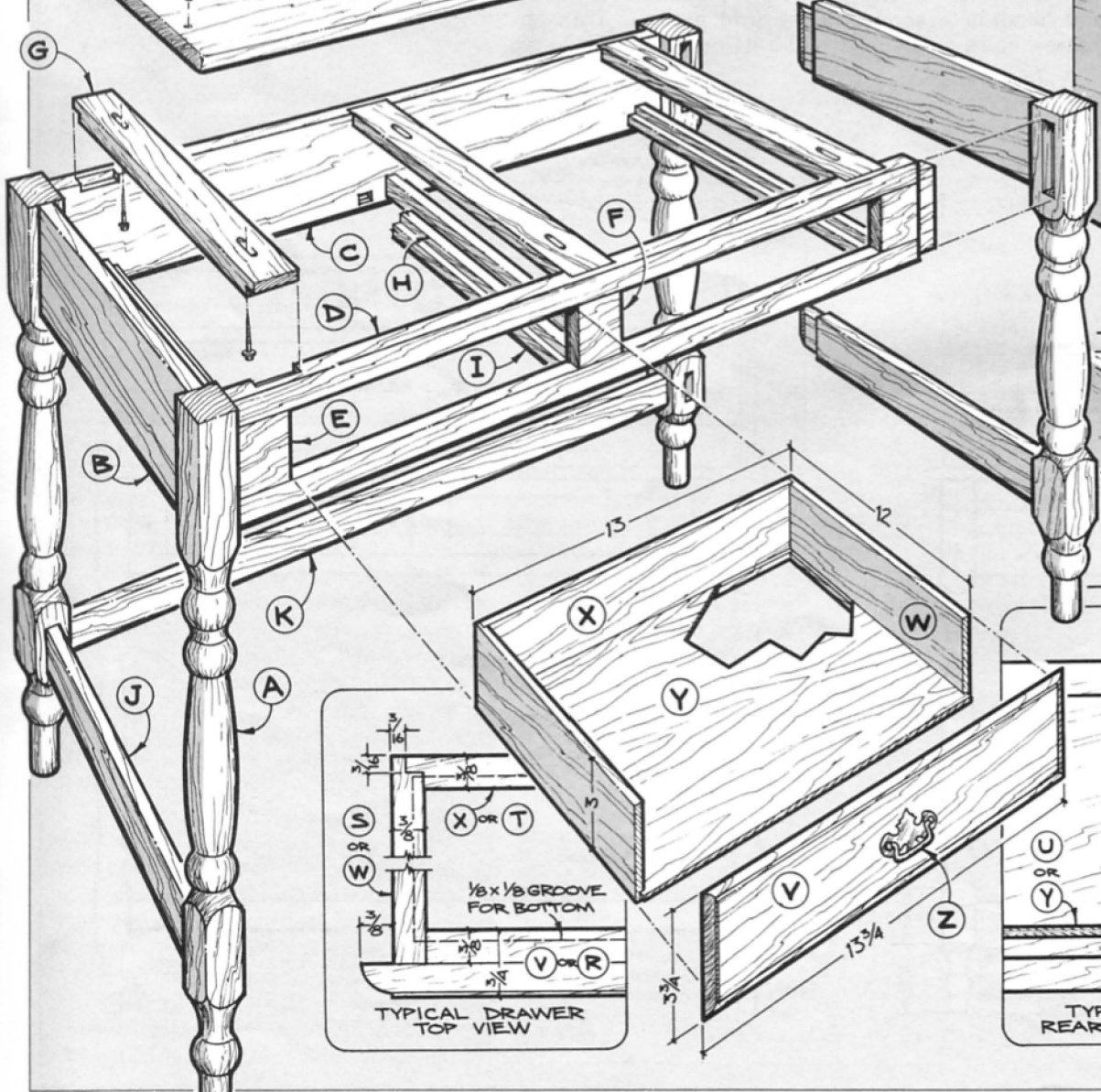
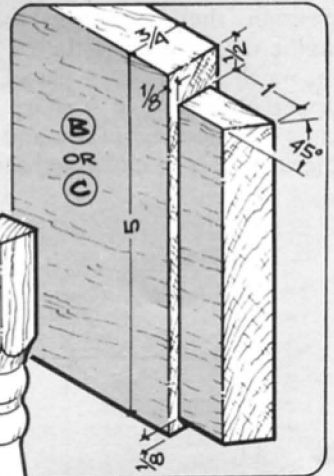
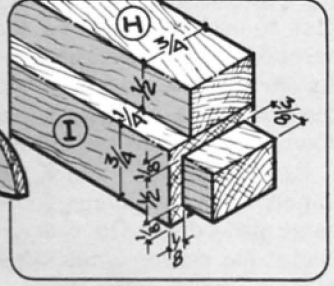
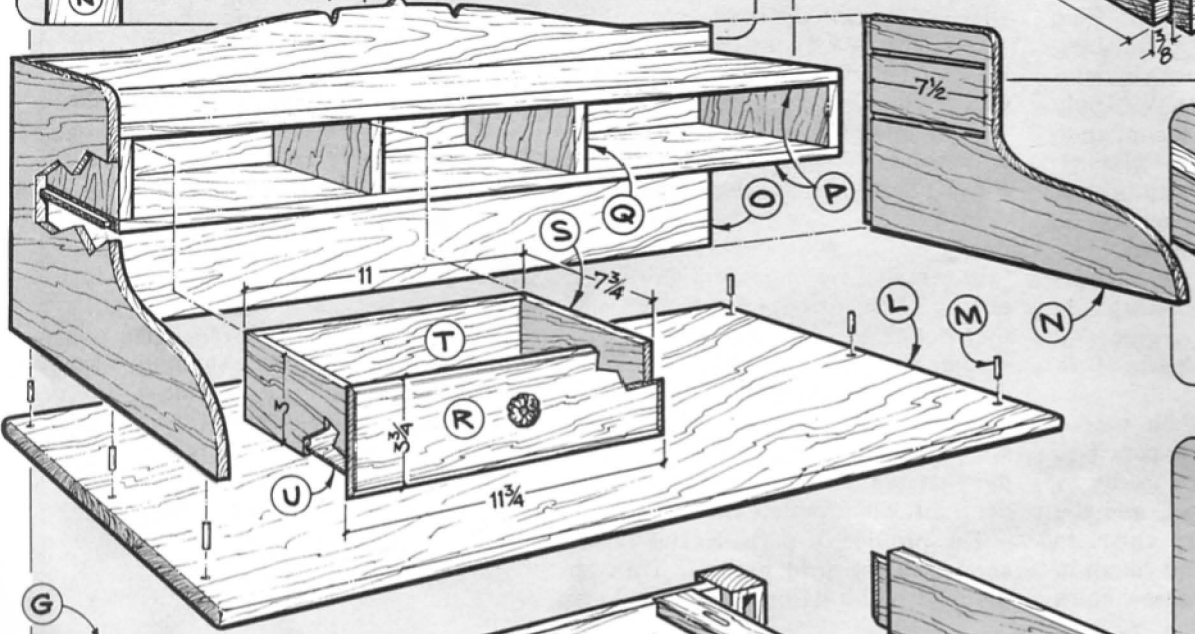
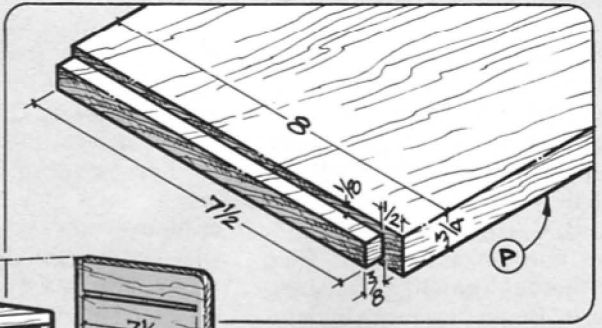
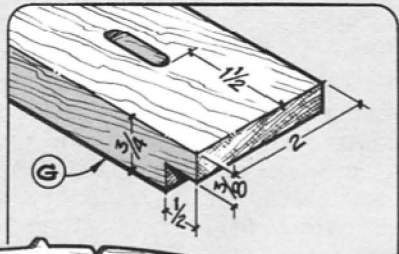
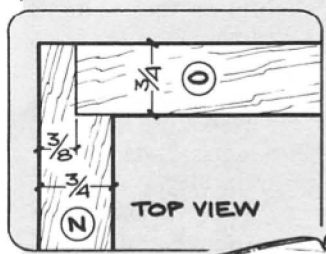
Next, use a sharp chisel to cut the mortises for the drawer runners (parts I) in part C and the lower part D. Note

Bill of Materials (All Dimensions Actual)

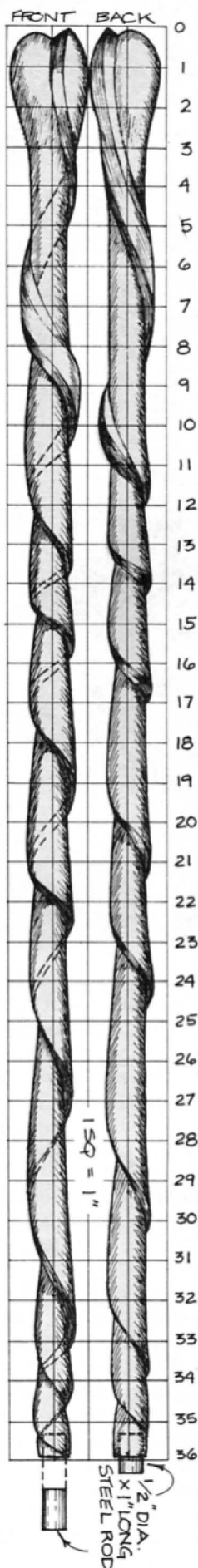
Part	Description	Size	No. Req'd	Part	Description	Size	No. Req'd
A	Leg	1 3/4 x 1 3/4 x 28 1/4	4	N	End	3/4 x 13 x 19	2
B	Side Apron	3/4 x 5 x 16 3/4 *	2	O	Back	3/4 x 15 x 33 3/4	1
C	Back Apron	3/4 x 5 x 34 *	1	P	Shelf	3/4 x 8 x 33 3/4 *	2
D	Drawer Frame	3/4 x 1 x 34 *	2	Q	Divider	3/4 x 8 x 3	4
E	Outside Spacer	3/4 x 3 x 3 *	2	R	Top Drawer Front	3/4 x 3 3/4 x 11 3/4	2
F	Inside Spacer	3/4 x 3 x 2	1	S	Top Drawer Side	3/4 x 3 x 7 3/4	4
G	Cleats	3/4 x 2 x 16 3/4	3	T	Top Drawer Back	3/4 x 3 x 10 3/4	2
H	Drawer Guide	1/2 x 3/4 x 15 3/4	4	U	Top Drawer Bottom	1/4 x 7 1/4 x 10 1/2	2
I	Drawer Runner	3/4 x 1 x 16 3/4 *	4	V	Bottom Drawer Front	3/4 x 3 3/4 x 13 3/4	2
J	Side Stretcher	3/4 x 1 1/2 x 16 3/4 *	2	W	Bottom Drawer Side	3/4 x 3 x 12	4
K	Back Stretcher	3/4 x 1 1/2 x 34 *	1	X	Bottom Drawer Back	3/4 x 3 x 12 3/4	2
L	Top	3/4 x 20 x 36	1	Y	Bottom Drawer Bottom	1/4 x 11 1/2 x 12 1/2	2
M	Pins	3/8 dia. by 1 1/2 long	6	Z	Bottom Drawer Pull		2

* including tenon(s)





Carved Walking Stick



We think this is a good project for those readers who have never done any carving, but have often had the urge to give it a try. It can be carved in just a few hours, and you don't need an expensive set of carving tools, just a $\frac{1}{2}$ in. wide well-sharpened chisel.

Our drawing shows the finished profile of our walking stick, but it should serve only as a general guide. Don't feel your carving must match it perfectly. Let your chisel be guided by the grain of the wood, and by your hands, and your eyes. Chances are your final carving will look considerably different from ours, and that's not surprising when you consider that no two individuals are alike.

To save time, we used the lathe to remove much of the waste stock. Start with 2 in. square stock cut to a length of $36\frac{3}{4}$ in., then turn it to a diameter of $1\frac{1}{8}$ in. from one end to the other. At a point about 5 in. from the top end, use the parting tool to reduce the diameter to $1\frac{1}{8}$ in. Starting at this point, and working toward the bottom end, gradually taper the piece to $\frac{3}{4}$ in. diameter at the bottom. As the stock becomes thinner it may be necessary to set up a steady rest or switch to a rasp or Surform tool to complete the taper.

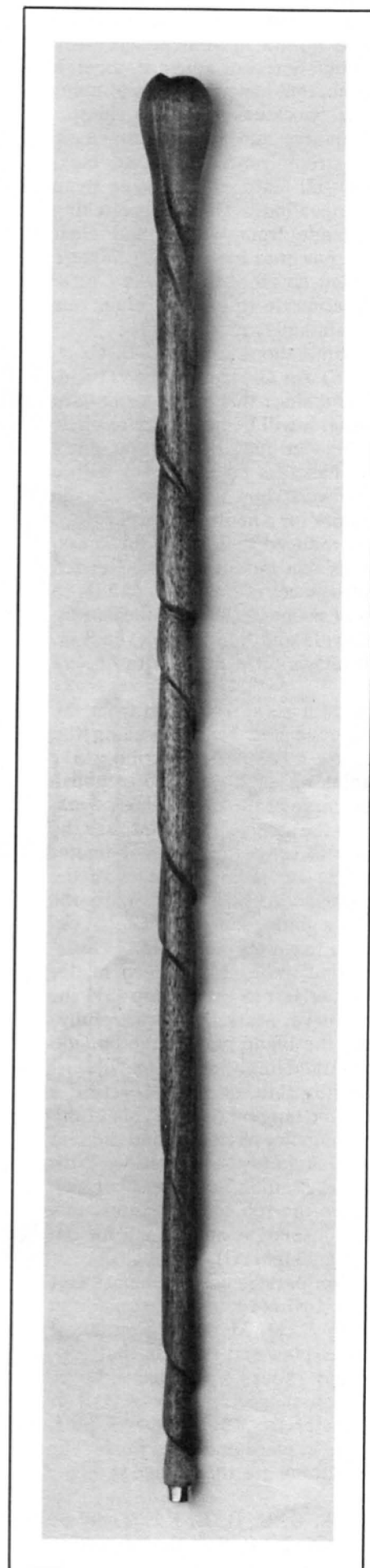
Now, at a point $\frac{3}{4}$ in. from the top end, begin to turn the "bulb", gradually reducing its diameter so that it blends into the $1\frac{1}{8}$ in. diameter established by the parting tool.

Next, rough sand (150 grit) the entire piece before drawing the spiral profile from the top to bottom. With the spiral as a guide, begin carving the piece at the top end. Take your time, don't hurry, and make sure the chisel is sharp.

Once the rough carving has been completed, use a cabinetmaker's file to shape and smooth all surfaces. Follow this with a thorough sanding, finishing with 220 grit.

At the bottom end, bore a $\frac{1}{2}$ in. diameter by $\frac{1}{2}$ in. deep hole to take a 1 in. long steel (or brass) rod. Use epoxy glue to hold the rod in place. Two or three coats of a good penetrating oil complete the project.

Wvj



While it's often argued that modern technology creates as many problems as it solves, the advent of the battery operated quartz movement has been one relatively recent advance, albeit a small one, that has made a great many amateur clockmakers quite happy. These quartz movements are small, light, extremely accurate, and inexpensive—all features that make them very appealing. This eye-catching clock, made from walnut and clear pine, is powered by a $2\frac{1}{4}$ in. square movement no more than $\frac{5}{8}$ in. thick, yet it's accurate to plus or minus one minute annually.

The laminations (parts A, B, C, D, E, and F) are all made from $\frac{9}{16}$ in. stock, and since this is not a standard thickness, it will be necessary to plane down heavier material. If you don't have a thickness planer, check with a local millwork shop as they will usually plane stock for a nominal charge.

Once reduced to $\frac{9}{16}$ in. thickness, the stock can be cut to size. Needed are three pieces of clear pine and three pieces of walnut, each one measuring $6\frac{1}{4}$ in. wide and 8 in. long. (The 8 in. length allows for a little extra on one end.)

Now, at a point $4\frac{3}{8}$ in. in from the bottom edge and centered along the width, use a compass to scribe a $3\frac{1}{8}$ in. radius on each piece to establish the top curve of the clock. Next, working from the same centerpoint, use the compass to scribe a $4\frac{3}{4}$ in. diameter circle ($2\frac{3}{8}$ in. radius) on each of the laminations except part B. With the circle as a guide, use an adjustable circle cutter to cut out each hole.

Now that the hole has been made, use a saber saw to cut the top ($3\frac{1}{8}$ in. radius) curve. Mark the cut carefully, keeping the blade just on the outside of the marked line.

Following this, on part E, scribe a vertical line tangent to each side of the $4\frac{3}{4}$ in. diameter circle. Extend the line from the circle to the top curve. With the line as a guide, use the saber saw to remove the top section. Later, this cutout will serve as an opening for the sliding panel (part G).

Now, on part B, use a compass (set to a $1\text{--}\frac{9}{16}$ in. radius) to scribe the time ring circle. Mark the location of the dowel pins and buttons that represent the "hours", then bore $\frac{1}{4}$ in. deep holes to accept each one. Cut $\frac{3}{8}$ in. diameter by $\frac{5}{16}$ in. dowel pins, then glue in place and sand flush. The dowel buttons are then glued in place as shown.

Parts A, B, C, D, E, F can now be glued together. Rather than trying to join all six pieces at once, it's best to join A to B, C to D, and E to F. The three pairs that result are then glued

Laminated Clock

by Scott E. Chapman



together to complete the assembly. When mating the parts together, work carefully to try and get the side and bottom edges to line up flush. And to keep parts from sliding over each other when clamp pressure is applied, it's a good idea to drive two or three small brads into one of the mating parts (before applying the glue), then snip the heads off so that about $\frac{1}{16}$ in. protrudes.

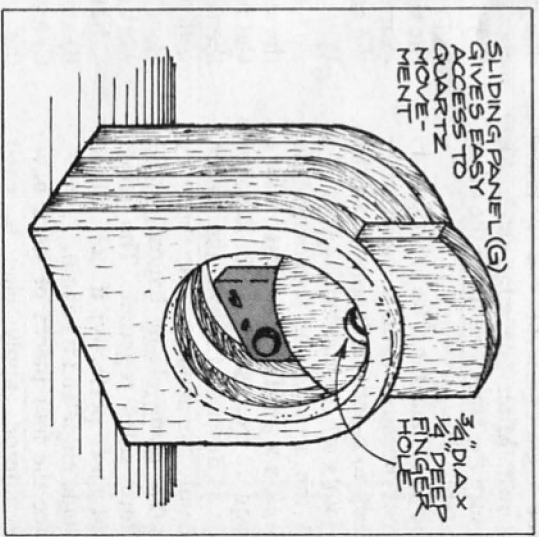
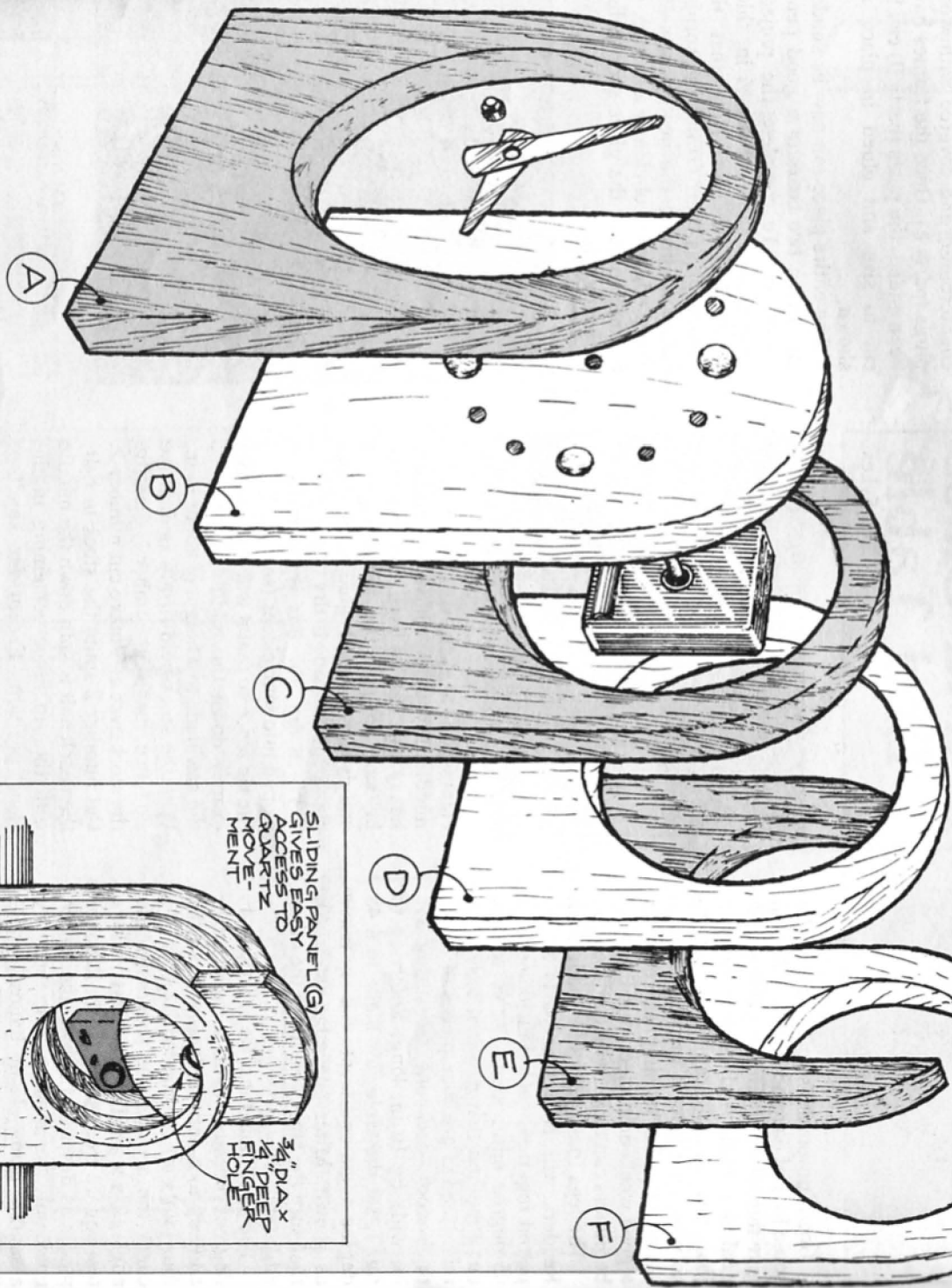
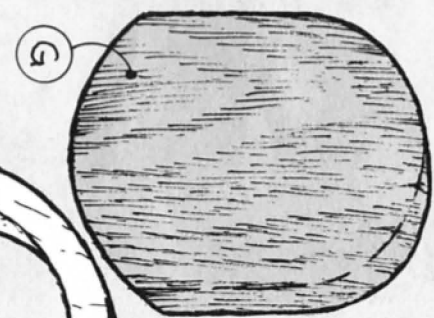
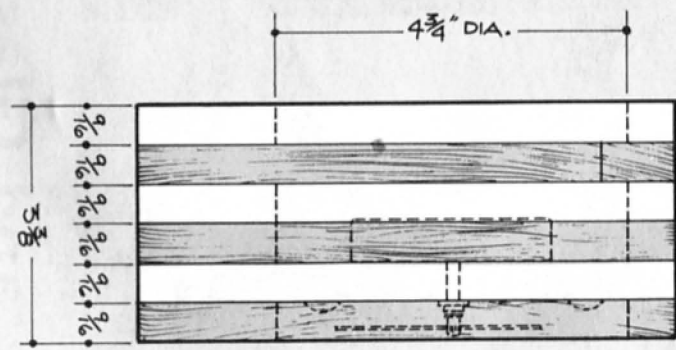
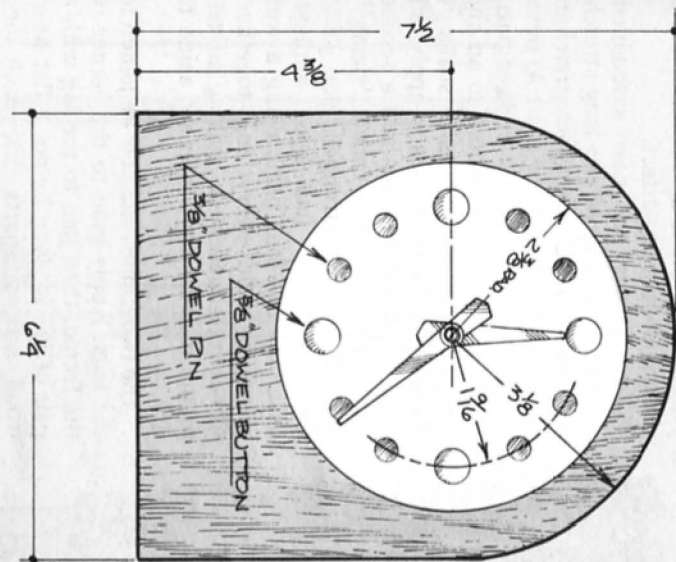
With parts A through F now glued together, the top and side edges can be sanded smooth. Start with coarse sandpaper to remove any unevenness between the laminations, then work through medium and fine grits, using 220 grit for the final sanding. The bottom is best evened out by cross-cutting the stock on the table saw. Make the first crosscut with the blade set to a height that's slightly more than one-half the thickness (about $1\frac{3}{4}$ in.), then flip the piece over and make the same cut from the other side. Make the second cut carefully so that it

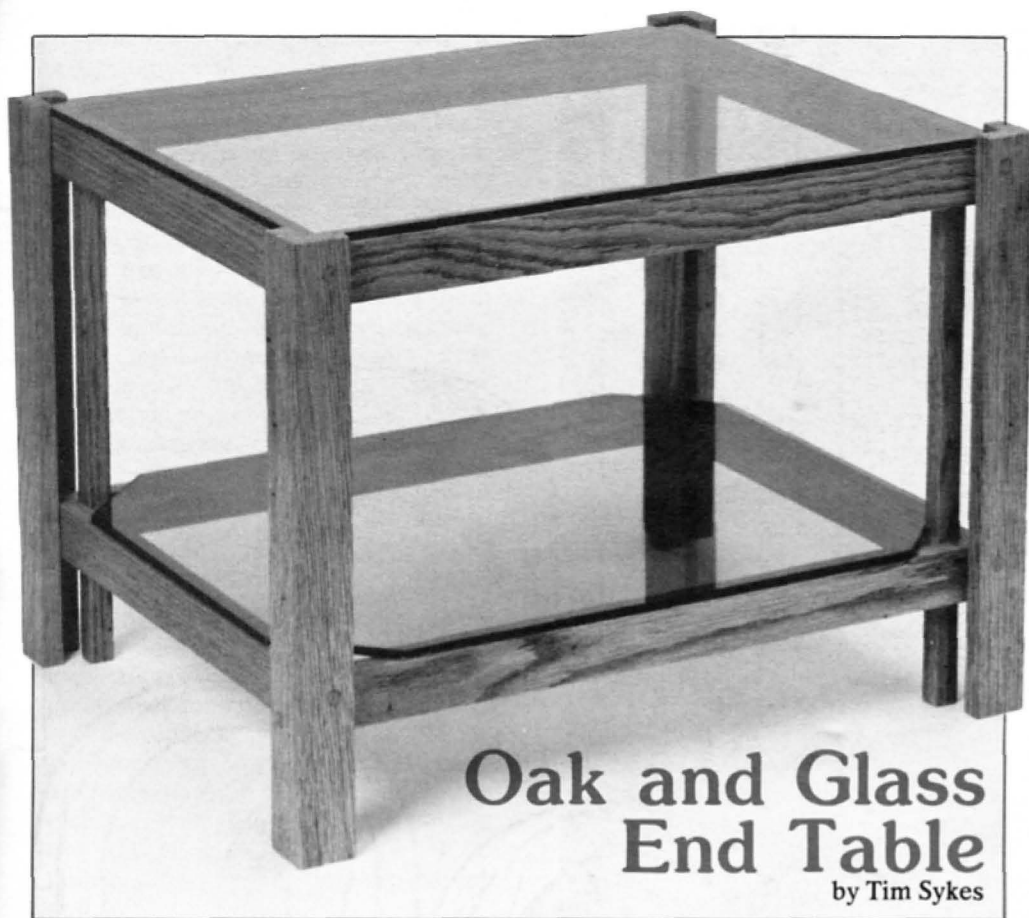
will be flush with the first cut.

The sliding panel (part G) can now be made. Use $\frac{9}{16}$ in. stock but sand it slightly thinner so that it slides easily. Cut it to fit the cutout in part E and smooth the top curve so that it's flush with the other laminations. A finger hole is added to make it easier to raise the panel.

The battery operated quartz movement is available from the mail order company Klockit, P.O. Box 629, Lake Geneva, WI 53147. Order part number 10022 (current cost is \$7.25 each plus \$2.30 handling charge). A pair of hands is included at no charge—order part number 402; specify brass. A $\frac{5}{16}$ in. diameter hole is bored through part B to accept the movement shaft.

Before adding the movement, give the entire piece a final sanding using 220 grit paper. Two coats of Watco Danish Oil provide an attractive finish that's easy to apply. The installation of the movement and hands completes the project.





Oak and Glass End Table

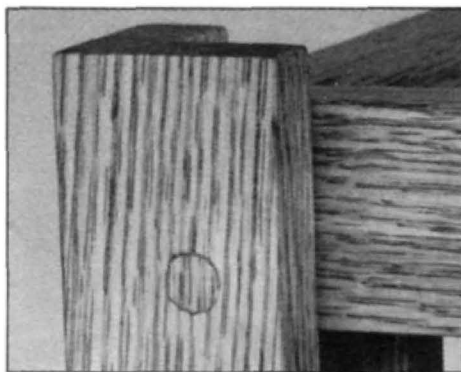
by Tim Sykes

Good proportions plus the handsome look of oak and glass combine to give this relatively simple piece a great deal of appeal. And even though the joinery is basic, the table is very sturdy so you can expect it to provide many years of service. Its simplicity makes it a good weekend project, one that even beginners can tackle with confidence.

The legs (part A) can be made first. Readers will note that parts A are paired together, each pair joined by a 45 degree miter joint. We've worked out a method that makes it easy to do this. Needed are four pieces of $\frac{3}{4}$ in. thick stock, each one measuring $3\frac{1}{2}$ in. wide by 16 in. long. Referring to fig. 1, set the table saw blade to a 45 degree angle and locate the rip fence as shown. Miter one edge (step A), then turn the stock and miter the other edge (step B).

The saw blade must be exactly at 45 degrees because even a small error adds up to a noticeable gap when the four joints are assembled later on. To check the accuracy of your sawblade angle, it's a good idea to first make a test square from scrap stock. Rip four pieces as described above (the length need only be about 6 in.), then dry assemble using elastic bands to hold the four sides together. The joints should meet perfectly; if not, adjust the blade angle and try again.

Once the four pieces of stock have been mitered, apply glue to each mitered surface and apply three web



clamps: one at each end and one in the middle. If you don't have web clamps, heavy tape can be used, but you must be sure to pull the joints together snugly for a good glue joint. Once clamped, set aside to dry thoroughly.

When dry, the box is ready to be ripped into four pieces (see fig. 2). Set the rip fence so that it will cut the stock exactly down the middle, then raise the sawblade to a height of about $\frac{3}{4}$ in. With the stock held firmly against the rip fence, make cut number 1, then flip the stock over and make cut number 2. Cut number 2 splits the stock in half, then each half is split down the middle with the rip fence remaining in the same position. Except for sanding, work on the legs is now complete.

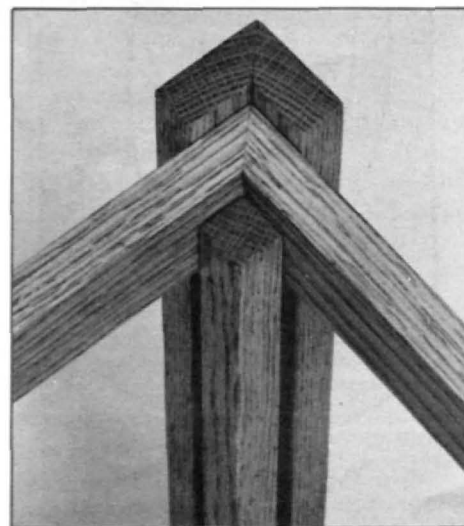
Next, the four long stretchers (parts B) and the four short stretchers (parts C) are cut to the dimensions shown in the bill of materials. Cut each one slightly longer than necessary, then

use the table saw to apply a 45 degree miter on each end while cutting to final length. As with the earlier miter joints, the angle must be perfect.

Two frames are now assembled, each one made up of two long stretchers (parts B) and two short stretchers (parts C). Unlike the leg (part A) miter joints, the miters on the ends of parts B and C are closely related to an end grain joint, so the oak really soaks up the glue. It's a good idea to apply one coat, let it soak in, then add a second coat. This technique, called "sizing", will result in a stronger glue joint. Once the glue has been applied, assemble the four parts using a web clamp to hold everything together. Check for squareness, making adjustments if necessary, then set aside to dry.

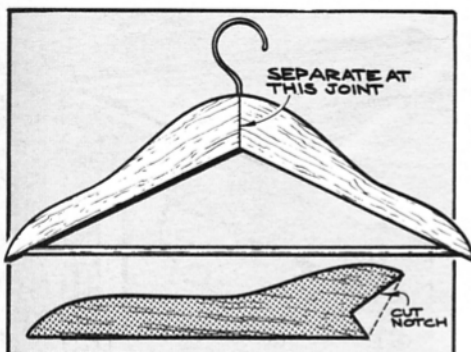
The two frames can now be joined to the legs. Apply glue to the corner of the frame, then join to the leg with a pair of $1\frac{1}{4}$ in. long by no. 8 flat head wood screws (parts E), each one counterbored and covered with wood plugs (parts F). Once the frames have been added, the posts (parts D) can be cut to size and glued in place as shown.

The entire piece can now be sanded and given two coats of a good penetrating oil. To complete the project, have a glass shop cut the $\frac{1}{4}$ in. thick plate glass to size. Note that the bottom glass (part G) has the corners cut to fit inside the posts (parts D). Sharp edges are obviously a hazard, so be sure to have the glass shop polish them smooth.



Bill of Materials (All Dimensions Actual)			
Part	Description	Size	No. Req'd
A	Leg	$\frac{3}{4}$ x $1\frac{1}{2}$ x $15\frac{1}{2}$	8
B	Long Stretcher	$\frac{3}{4}$ x $1\frac{1}{2}$ x $20\frac{1}{4}$	4
C	Short Stretcher	$\frac{3}{4}$ x $1\frac{1}{2}$ x $15\frac{1}{4}$	4
D	Post	$\frac{3}{4}$ x $\frac{3}{4}$ x $14\frac{1}{4}$	4
E	Flat Head Wood Screw	$1\frac{1}{4}$ x #8	16
F	Wood Plug	$\frac{3}{8}$ dia. by $\frac{1}{4}$ long	16
G	Bottom Glass	$\frac{1}{4}$ x $15\frac{1}{4}$ x $20\frac{1}{4}$	1
H	Top Glass	$\frac{1}{4}$ x $15\frac{1}{4}$ x $20\frac{1}{4}$	1

Shop Tips



A wooden coat hanger, separated at the joint, results in two nicely shaped preformed push sticks for your table or radial-arm saw. All they need is a small notch on one end.
Steven Johansen, New Bedford, Mass.

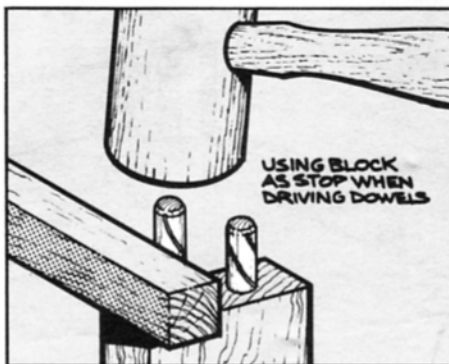
There's nothing worse than sanding one side of a board and turning it over to find a variety of dents and scratches on the previously sanded side—all caused by the rough surface of your workbench. My solution to the problem was to add four or five sheets of newspaper to the bench top before

sanding. It acts as a cushion and provides protection for the board.

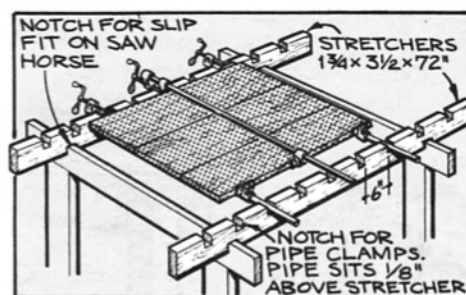
David J. Fessler, Villas, N.J.

A brush used to apply white glue will quickly harden if not washed out right away. To bring it back to life, give it a good soaking in common apple cider vinegar.

Don Kinnaman, Phoenix, Ariz.



Use a piece of scrap stock as a stop when a number of dowel pins must be driven to the same depth. Determine the amount the pin should protrude, then cut the scrap stock to the same thickness. Drive the pins until their tops are flush with the stop.



A pair of notched stretchers along with a couple of sawhorses will make a handy glue-up table that can be easily disassembled. A glue-up table makes edge-joining considerably easier. It holds the bottom pipe clamps in place, evenly spaced, allowing both the top and bottom clamps to be tightened with a minimum of fuss. When you're done gluing, remove the stretchers and store them out of the way.

The Woodworker's Journal pays \$25 for reader submitted shop tips that are published. Send your ideas (including sketch if necessary) to: The Woodworker's Journal, P.O. Box 1629, New Milford, CT 06776. Attention: Shop Tip Editor. We redraw all sketches so they only need be clear and complete.

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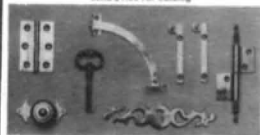
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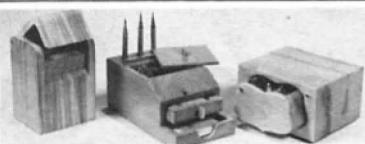
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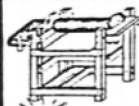
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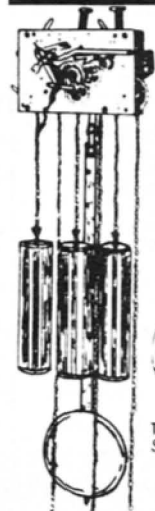
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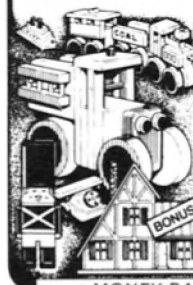
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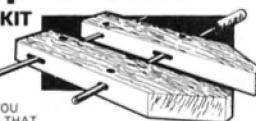
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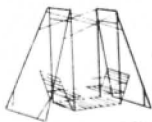
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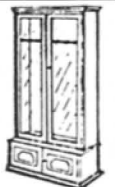
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Woodworkers Make Money when they learn from "The Woodworkers Money Book". Covers how to sell retail and wholesale, pricing, credit, labeling, much more. Money-back guarantee. Mailed first class for \$3.00. Inprint, Box 687, Farmingdale, NJ 07727.

Toy Plans, Books, Tools, Video Tapes, audio tapes, the universal power tool jigs. DeCristoforo Designs 1984 Catalog! Over 80 years of woodworking experience combine with our unrelenting commitment to bring you the most innovative woodworking aids available! We offer full-size action toy plans, full-size plans for the universal table saw jig and the universal drill press jig. R. J. DeCristoforo's video table saw course! Jim Ingall's video sharpening course! R.J. DeCristoforo's woodworking books! The "Snap Stop" instant reference clamp for table saw cross cutting! Send for our catalog today! \$1.00 to DeCristoforo Designs, 27082 Horseshoe Lane, Los Altos Hills, CA 94022.

Eliminate Dowels—Unique Joinery System, completely shop made, fast. Absolutely accurate precision joints. Plans \$8.95. Allan, 8592 Hemlock Way, Buena Park, CA 90620.

Shopsmith Owners: Lathe Duplicator designed especially for you. Also 1/4 in. router bit holder. Brandywine Wood & Tool, Dept. 56WJ, 2413 Driftwood Dr., Wilmington, DE 19810.

Quartz Clock Battery Movements. Catalog \$1.00 (refundable). C. Mett's Specialties, P.O. Box 356, Worthington, OH 43085.

Cutest toy ever, walking waddling wooden duck. Also climbing bear. For plans, send \$4.00 to: Heslop's, P.O. Box 3262C, Ogden, UT 84409.

Poor Man's Catalog—U-Build Power tools, saws, lathes, engraving machine, energy savers, crafts, furniture, toys and much more. \$3.00. Patterson Enterprises, Dept. W, P.O. Box 1390, Apopka, FL 32704-1390.

"Thickwall" Homes Manual. Huge Savings when you build your warm, charming (cordwood) log home or addition. Contains technical data, insulating factors, designs, time saving tips. All the information needed to build. \$8.95 (refundable with purchase of blue prints). Visa, Mastercard accepted. SDS Incorporated, Construction Office, Box 1189, Buena Vista, CO 81211.

Toy Truck Plans. Sixteen and eighteen wheel flat beds plus pickup. All three full-size plans, building instructions and dip finish formula \$8.00. 1 1/2" wheels: \$8.00 per 100. Wood 'n Things, Box 518, Mount Pleasant, NC 28124.

Over 75 Patterns! Enjoy making profitable wooden gifts, toys, household accessories. Plus "Shop Secrets". Only \$5.00. Accents (J-54), Box 262, Danvers, MA 01923.

Flipper-ringer? Yes. An easy-to-make fascination action toy. Tranquilizing effect for all ages. Plans \$2.00 with SASE. L & B Craft Shop, Route 1, Middlebourne, WV 26149.

Unique power table or miter saw. Also lathe, planer-thicknesser, biscuit groover. Catalog \$1.00. Gee Tee Enterprises, Route 2, Box 32 AW, Galva, KS 67443.

Plans for inexpensive way to make picture frame clamps out of scraps \$4.00. S. Turner, Route 1, Box 510, Mt. Jackson, VA 22842.

Shaker or Mug Pegs \$7.95 per 50; Bean Pot or bell shaped candle cups \$4.98 per 25; toy parts—little people \$3.25 per 25; smoke stacks \$5.50 per 25; maple wheels 3/8" \$3.00 per 100, 1" \$3.95 per 100, 1 1/2" \$5.95 per 100, 2" \$12.50 per 100, 2 1/4" \$14.50 per 100, 2 1/2" \$19.50 per 100. Axle pegs for 3/8" to 1 1/2" wheels \$3.00 per 100. Axle pegs for 2" to 2 1/2" wheels \$3.50 per 100. Prices good until August 31st. Add \$3.25 for order to \$35.00. Add \$4.75 if order over \$35.00. Much more in our brochure \$1.00. Free with order. K & K Woodcrafters, RD 4, Box 270A, Scotia, NY 12302.

Unique Chair—Rocks without Rockers. Easily removable cloth seat. Folds in half for storage. Material costs under \$10.00. Detailed plans \$4.00. Bennett Wood Products, Route 8 Box 680-S, Pensacola, FL 32506.

35 Full Size Toy Patterns! Ten Cars, Six trucks, two airplanes, nine hot-rods, six piece train, two earthmovers! Only \$5.00! Franks, 1202-J21 Second, Booneville, MS 38829.

Thin Hardwoods, 1/32" to 1/4" thick, cherry, walnut, butternut, oak, etc. Large SASE. Shaker Miniatures, Dept. WJ, 2913 Huntington Rd., Cleveland, OH 44120. (216) 751-5963.

Original Toy Plans, build sturdy toys with easy-to-follow plans. Trucks, trains, bulldozer, crane, fire truck, rocking horse, doll cradle and more. Catalog of parts and plans \$1.00, refundable with first order. Toykraft, Dept. WJ-5, 601 East Main St., Waynesboro, PA 17268.

Craft Show Veteran, show sales over \$1200.00, plans for my three best-selling Country Style primitive wood items, plus colored photograph of each tells why they sell plus tips on increasing your craft sales. Send \$5.00 to: Darrell Purdy, 6608 North Wayne, Gladstone, MO 64118.

Woodworkers: Send stamped long envelope to learn how you can own a \$1,000 scroll saw for \$299. Yoder's Sales & Service, Box 159, Clark, MO 65243.

Toymaking For Fun, Profit!! Illustrated ideas! Patterns, supplies, wheels! Information free. Morgan, W04B09, 1123 Bardstown, Louisville, KY 40204.

Build Your Own Roll Top Desk at low cost! Complete easy-to-follow plans for raised panel construction. Send \$7.95 to: Bud's Plans, 2960 Egan Ave., Eagan, MN 55121.

Lowest Prices. Craft Furniture and Toy parts. Brochure \$1.00. K & K Woodcrafters, RD 4 Box 270A, Scotia, NY 12302.

Make Wooden Toys—Plans, hardwood wheels, parts, dowels. Catalog \$1.00. Cherry Tree Toys, Belmont, OH 43718.

Money Makers. 6 animal pull toys—full size patterns—trace and cut out. Complete finishing instructions. \$3.00. Weekend Crafts, 24 Sherwood Ave., Franklin Square, NY 11010.

Woodcrafts. Veteran Craftsman has experienced \$1000 Craft Shows, will send plans for 6 best-selling wood items for \$5.00. Bennett Wood Products, Route 8 Box 680-S, Pensacola, FL 32506.

Woodworkers: Make \$100.00 every Saturday with your shop scraps! Complete instructions \$3.00. Cedartree, Box 744E, Oregon City, OR 97045.

Shop Notes