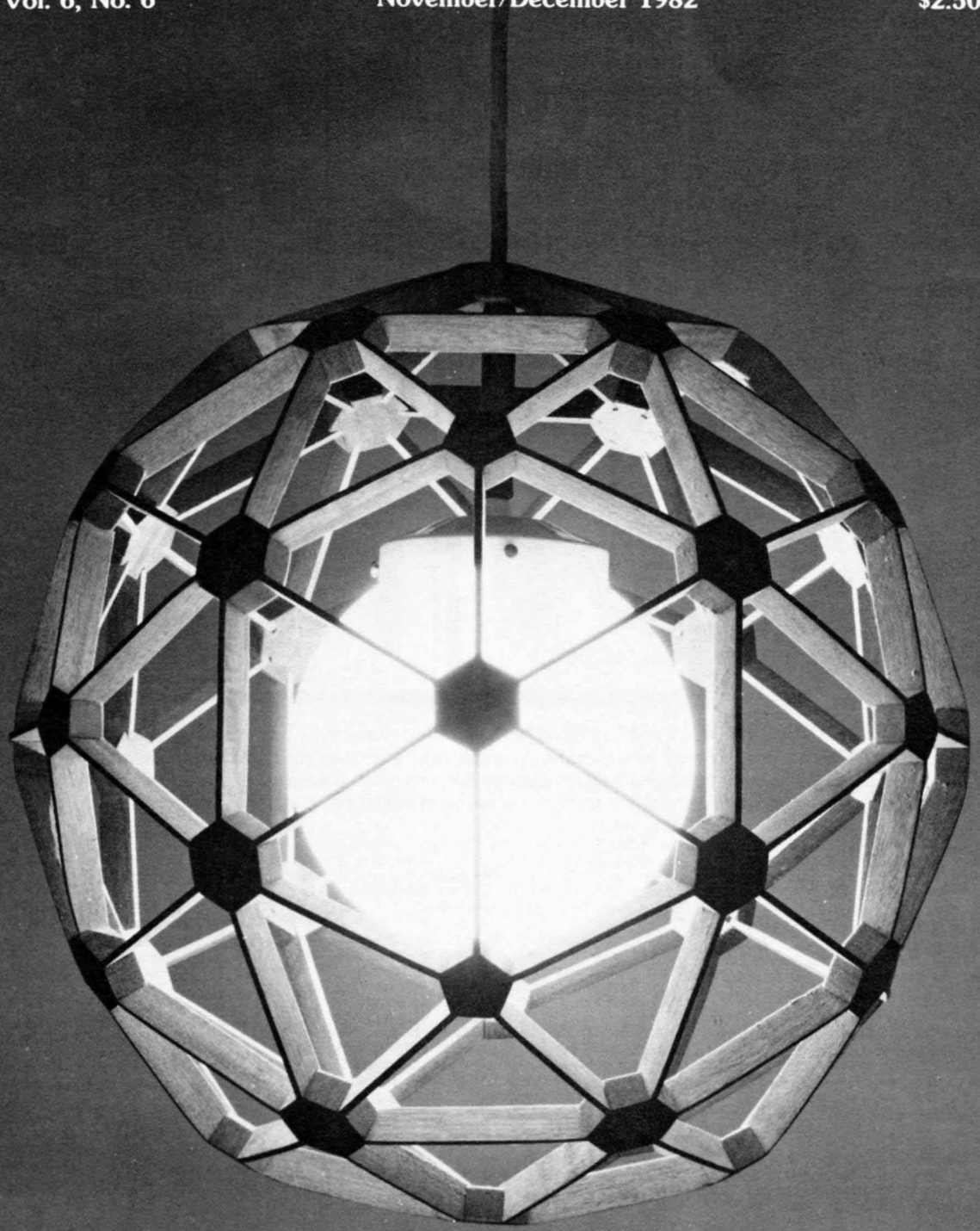
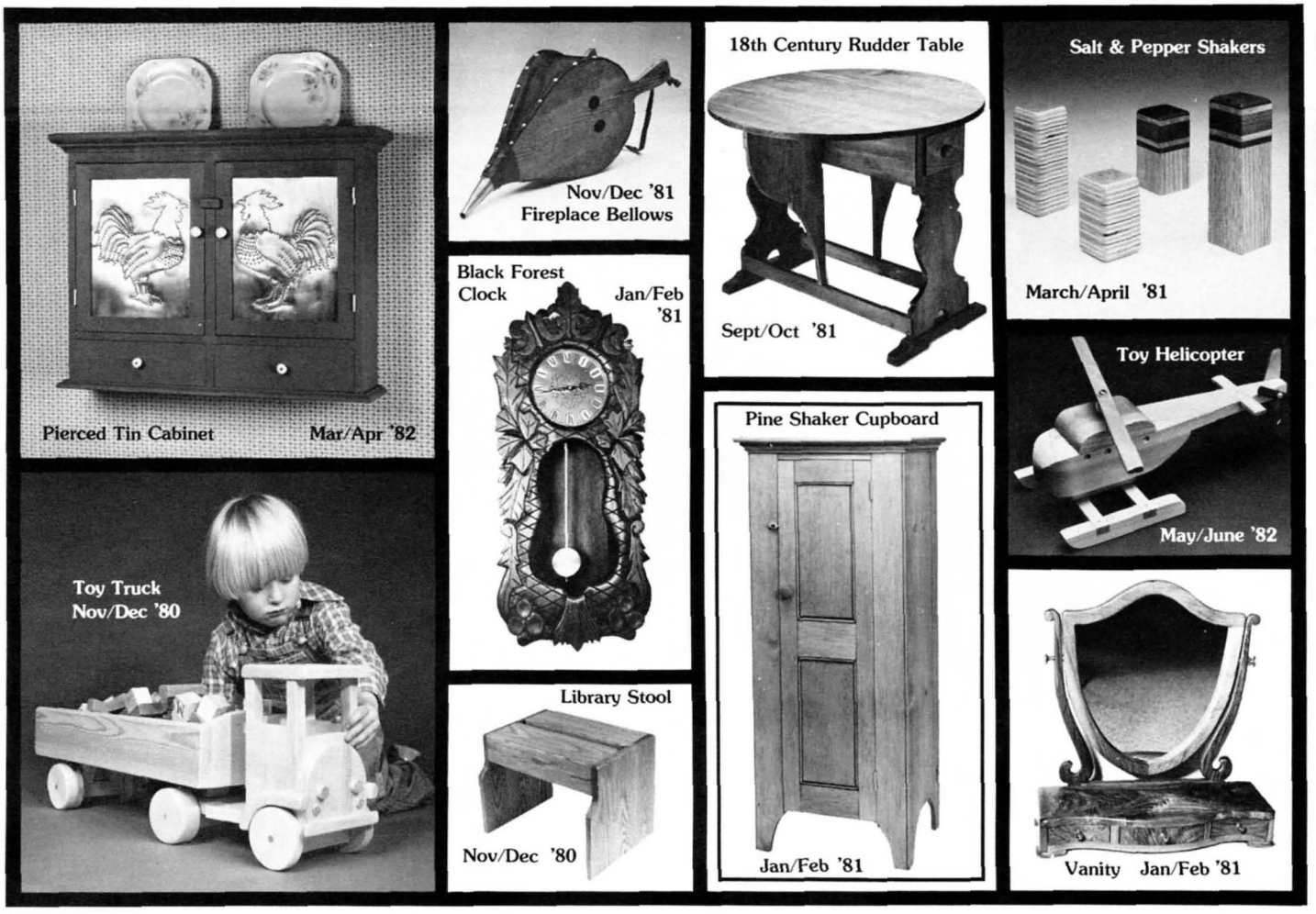
The Woodworker's Journal

Vol. 6, No. 6 November/December 1982 $2.50



Included In This Issue: Tree Ornaments • Sawhorse Dining Table
Cider Press Lamp • Router Jig • Old-Time Radio Case • Lyre Clock
Shaker Wall Shelves • Toy Tool Box • Geodesic Lighting Fixture

BACK ISSUES



Each issue of *THE WOODWORKER'S JOURNAL* is filled with detailed plans for all types of woodworking projects, a few of which are shown above. There are also regular columns on restoring antiques and workshop income plus useful jigs and shop tips, but our main purpose has always been to provide our readers with a variety of *PROJECT PLANS*. Check the contents of available issues below and send your order today...supplies are limited.

Vol. 3 No. 6 Nov-Dec '79: Clothes Tree, Pine Floor Lamp, Harvest Table, 5 Holiday Gifts, 19th Cent. Washstand, Tablesaw Round Tapering Jig, Quilting Frame, Tot's Tricycle, Swedish Door Harp.

Vol. 4 No. 1 Jan-Feb '80: Doughbox End Table, Contemp. Loveseat, Mahogany Chairside Table, Corner Cupboard Part I, Small Pine Corner Cabinet, Knife Rack-Cutting Board, Apple-Shaped Mirror, Pine Tape Dispenser, Auxilliary Cut-Off Table for Tablesaw.

Vol. 4 No. 2 Mar-Apr '80: Firewood Rack & Carrier, Red Baron Triplane Toy, Pine Pie Safe with Pierced Tin Panels, Contemp. Glass Top Coffee Table and Matching End Table, 19th Cent. Pine Commode, Corner Cupboard Part II, Butcher Block Toy Box, Mahogany Corner Shelf, Jig for Wooden Trivets, Radial Arm Crosscut Table.

Vol. 4 No. 3 May-June '80: Miniature Campaign Chest, 19th Cent. Sawbuck Table, Decorative Frog, Violin Sconce, Shaker Cutlery Tray, Swinging Bracket & Planter, Club Chair & Ottoman, Oak Cottage Chair, Wooden Lock.

Vol. 4 No. 4 July-Aug '80: Magazine Rack, Gothic Oak Stool, Whale Cribbage Board, Doll Cradle, Nut & Bolt Toy, Basketweave 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/Lamp, 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, 18 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.

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 Icebox, 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, Latticework Cutting Jig.

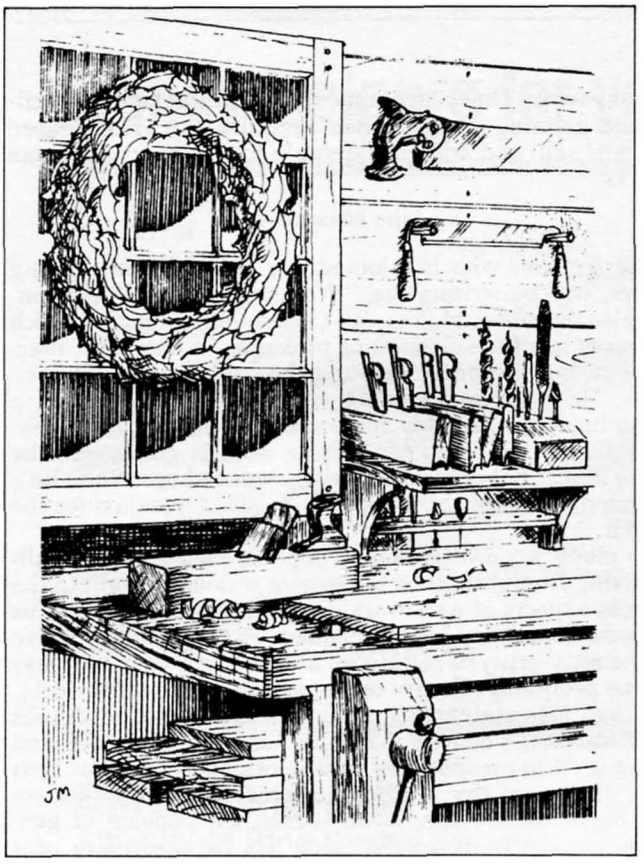
Vol. 6, No. 2 Mar-Apr '82: Early American Blanket Chest, 18th Cent. Corner Shelf, Pine Footstool, Cheese Cutting Board, Napkin Holder, Trivets, Coaster Set, Pierced Tin Cabinet, Hutch Clock, Oak File Cabinet, Mahogany Tripod Table, Wall Hung Plant Bracket.

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.

Please Note Vol. 3, No. 6 through Vol. 4, No. 4 are newsprint issues for $1.50 each. From Vol. 4, No. 5 on, they are magazines for $2.50 each, postpaid. CT residents only please add 7½% sales tax.



The Woodworker's Journal

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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.

Shoptalk

Woodworking Time

The frost is on the pumpkin again...at least in this neck of the woods, and you know what that means. It's time to sweep out the shop, clean the sawdust out of the tablesaw tilt mechanism and sharpen all the chisels and plane blades. In other words, it's time to get down to some serious woodworking.

A Sphere of Influence

This issue is a bit of a departure for us in that the balance of projects falls a bit more on the contemporary side. The Geodesic Lighting Fixture is, in itself, a very out-of-the-ordinary woodworking project. It's fascinating to see how a few small pieces of wood can be cut up and reassembled to form the large, airy sphere. It occurred to us that the sphere could be made with a smaller diameter to take a five inch diameter globe and set on a base to make a very striking table or desk lamp.

Coming Attractions

Early American buffs can rest assured that the January/February 1983 issue will contain some nice traditional projects including a nicely scaled reproduction of an 18th century mahogany butler's tray table. We also hope to introduce some unusual old decorating techniques. The wall cabinet with punched tin door panels, shown in the March/April 1982 issue, proved to be a very popular project, so we've been working on other traditional ways to decorate framed panels. These techniques, including reverse stencilling and painting on glass, don't require any great degree of artistic skill and add considerably to the beauty of some projects.

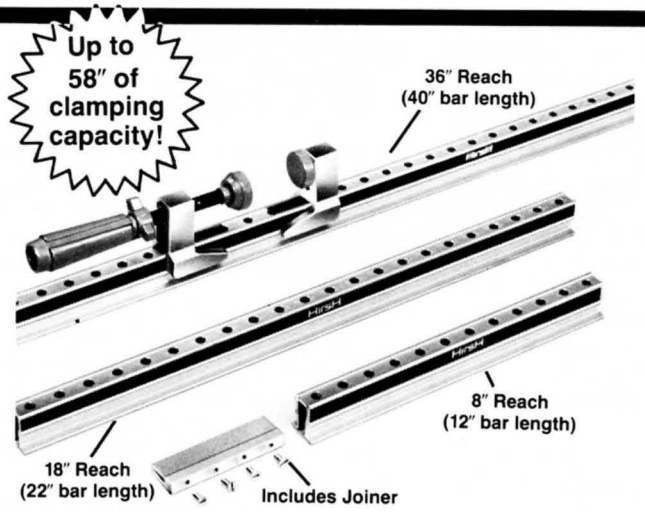
At the Masthead

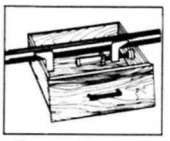
Paul Kellam, who has joined our staff of Contributing Editors, will be writing the "Workshop Income" column. He's also the editor of *Personal Computing* magazine which addresses itself to solutions of problems in business, management and the home through the use of personal computers. He was the founding editor of *Inc.* magazine, a how-to business monthly for owners of small companies. Paul tells us that when his editing work is going well, he likes to build Shaker furniture in his home shop. When he's frustrated, he builds bird houses "by the dozen just for the hell of it."

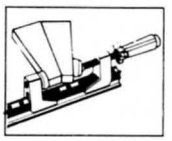
Too many woodworkers who hope to earn a part or full-time living from their craft fail to give serious thought to the business aspects of woodworking. This is usually a serious and sometimes very costly mistake. Paul will really delve into the nitty-gritty of setting up and keeping your business running profitably. Future topics will include cutting costs, profit and loss statements, selling and tax and insurance considerations. I believe that Paul has the experience and writing style to present this vital information in a way that avoids the usual dry textbook approach. Considering today's horrendous unemployment rate, the concept of generating income from woodworking has become more of a reality than a daydream for many. I'm hopeful that *The Woodworker's Journal* can be of some help in this situation.

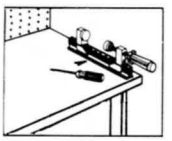
Jim McQuillan

Handy Helpers for your workshop from Hirsh




Reversible jaws


Adjusts for angles


Mounts to workbench

Hirsh ULTRA CLAMP Adjustable Bar Clamp Set

Clamps or spreads with Pressure ranging from very light to over 1,000 pounds.

For the shop or home craftsman. Instantly adjustable sliding jaws clamp or spread for a wide variety of uses. Oversize non-mar pressure pads adjust to angled surfaces. Power grip handle has special finger lugs and ½ in. screw for maximum torque. Includes three rugged anodized, extruded aluminum bars, one joiner and one set of jaws and brackets. Provides up to 58" of clamping capacity.

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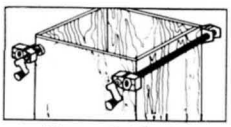
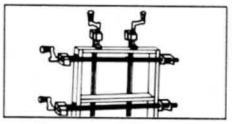
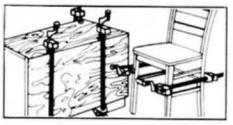

Clamp Cabinets


Construct Frames


Construct and Repair Furniture

½" pipe reducer, screws into head unit, two ½" adapters lock into both openings of tail unit.

Pipe not included

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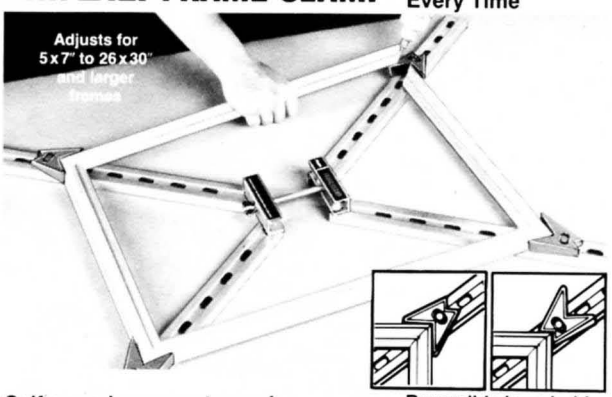


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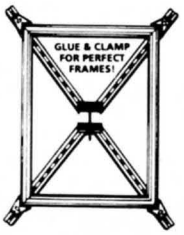

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Letters

Recently I have been receiving inquiries from readers of your September/October 1982 issue (*Editor's Note: See Workshop Income, page 14, of that issue)* about *The 1981 Craftworker's Market*. I certainly appreciate your sharing news about the book, but to avoid confusion I wanted you to know that our new edition has been revised and given a different title: *The 1982/1983 National Directory of Shops/Galleries, Shows/Fairs.*

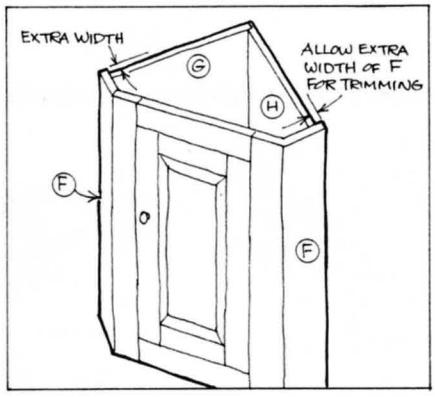
Nancy D. Kersell, Special Markets
Writer's Digest Books

The book can be ordered from your local bookstore or Writer's Digest Books, 9933 Alliance Road, Cincinnati, OH 45242. It lists over 2,300 outlets for showing and selling a variety of freelance work, including pottery, weaving, drawings, painting, and of course woodworking. Price is $12.95, paperbound.

Concerning the attractive hanging corner cupboard on page 25 of your September/October 1982 issue, the drawing shows the rear panels "G" and "H" assembled flush with the side rails "F". However due to the fact that very few corners in homes are exactly at 90 degrees, the craftsman may be in for a bit of disappointment upon installation. His carefully cut and measured cabinet may not fit very well.

Speaking from unsquare room experience, the arrangement shown in the sketch would be much more forgiving. Have parts "F" extend ¾ inch or so beyond back panels "G" and "H". This simple alteration will compensate for any out-of-squareness, as well as leaving some extra stock for a few passes with a plane should a wall be out of plumb as well.

Terry Plata, Pontiac, IL



Where is it possible to purchase glass lamp chimneys of various sizes and shapes?

Edward R. Andrews, Morrisville, NY

The Corning Glass Works, Residential Lighting Department, Corning, NY 14831 manufactures some beautiful traditional chimney shapes. Write Corning for the name of their nearest dealer.

Your March/April 1982 issue had plans for a pierced tin cabinet on page 28. However, there were no instructions on how to make the molding (part J).

F.H. Payne, Knoxville, TN

Although we specified crown and cove molding, and gave a cross-sectional view, we should have mentioned in the article that it is a standard molding available at almost any lumber yard.

We think readers of *The Woodworker's Journal* will be particularly interested in our new brochure on wood-

(Continued on page 8)

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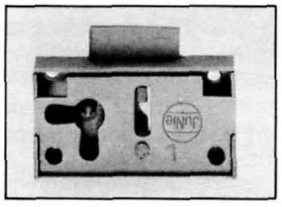

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Suited to drawers and cabinet doors. Case length is 42mm and 9mm wide.

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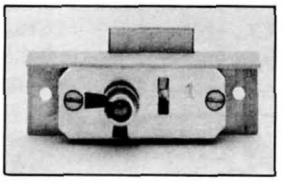
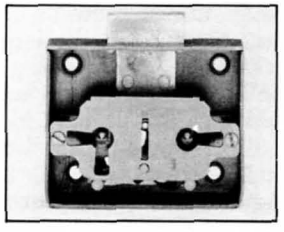
13J12-XI	22.7 mm	3.25 ppd.

SMALL FLUSH MOUNT LOCK

No catch plate required. Lock plate 60mm x 12mm; exposed face 60mm long x 20mm deep.

Catalog No.	Price
13J22-XI	$8.25 ppd.





SCREW-ON TYPE BRASS LOCK

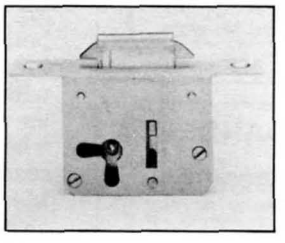
When speed & efficiency are required; three positions for flexibility. Rough-textured case 65.5 mm x 11.8mm.

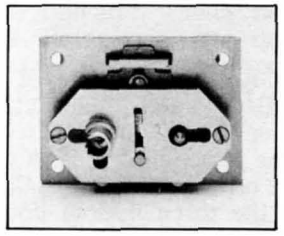
Catalog No.	Case Depth	Price
13X31-XI	52mm	$ 9.95 ppd.
13X32-XI	62mm	10.75 ppd.

FULL-MORTICE CHEST LOCK

For pianos, chests, large lids; wings retract as bolt unlocks. Lock plate 85mm x 15mm; case 50mm x 11mm.

Catalog No.	Case Depth	Price
13J51-XI	40mm	$8.95 ppd.
13J52-XI	45mm	8.95 ppd.





FLUSH-MOUNT LOCK

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Catalog No.	Price
13J32-XI	$3.10 ppd.

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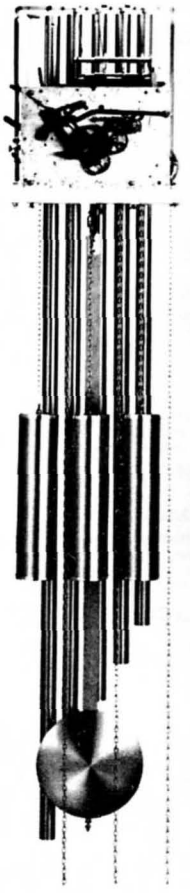

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Letters (Cont'd)

cutting band saw blades. It's full of how-tos for the band saw user. There are four pages of detailed drawings and diagrams covering a variety of topics - from choosing the right size and type of tooth, to safety tips and common problems and solutions. Titled *Wood Cutting Band Saw Blades*, we think it's a handy reference guide.

For a free copy, write to The Olson Saw Company, a Division of Blackstone Industries, Inc., Bethel, CT 06801. Ask for OL-28A.

Ellen K. Farenholz
The Olson Saw Company

Recently I became the owner of a Craftsman 6" thickness planer, Model No. 103.23700. The manufacturer was King-Seeley Corporation. I am in need of an operator's manual as Sears and King-Seeley do not have this information in their files. I would appreciate hearing from a reader who owns the manual or has information on this planer.

James P. Hicks
317 Cherokee Trail
Huntington, WV 25705

I am trying to locate some turning blocks of orange and lemon wood. Living in Florida, you would think that both would be obtainable, but unfortunately this is not the case. Checking with several lumber yards has turned up nothing. And they cannot tell me who to contact. Hopefully one of your readers will have a source.

Marie Thillen
5876 111th Street
Jacksonville, FL 32244

I enjoyed making a couple of the casserole dish holders featured on page 27 of your May/June 1982 issue. However, the pictorial view is in conflict with the orthographic projections. One shows the three bottom dowels going through the ends while the other shows them only 7/16 inch deep.

Ron Naveken, Old Saybrook, CT

The orthographic drawing is the correct one. It shows the bottom dowel holes drilled to a depth of 7/16 inch. Thanks for catching this for us and our readers.

Can you tell me where to purchase plans and materials for building a pool table?

D. Howe, Crystal Lake, IL

Letters (Cont'd)

Pool table plans and parts are available from Armor Products, Box 290, Deer Park, NY 11729. Send $1.00 for a copy of their current catalog. Also, Tiercraft, Dept. E, Box 8151, Erie, PA 16505 has plans available ($9.95) as well as kits.

Editor's Note: Lately we've had a number of readers asking if we know of a source for cabriole legs. We just recently learned that Clifton Cabinet, 10412 Church Hill Road, Myersville, MD 21773, offers a nice selection of these legs in cherry, mahogany, walnut, oak, and maple. Write to them for more information.

I would like some information on caning. Can you direct me to a reference source?

Richard Berry, Lone Pine, CA

The company Cane and Basket Supplies, 1283 South Cochran Ave., Los Angeles, CA 90019 carries several instruction booklets. Titles include Cane Seats for Chairs *(75¢),* Chair and Stool Seating *($1.25),* Repairing Chair Seats with Cane *($1.50), and* Wicker and Cane Furniture Making *($6.95). On orders less than $10.00 add $1.00 handling charge. There's also a delivery charge of 10 per cent of amount ($1.25 minimum).*

Woodworking Club Notes

Kishwaukee Woodworkers (founded in October, 1981) is an organization of over 100 area woodworking enthusiasts. Though most are concentrated in the DeKalb/Sycamore area, the group draws members from all over northern Illinois to participate in various woodworking activities. Skill levels range from beginners to professional and all ages are represented.

The purpose of the organization is: 1) to promote and encourage all phases of woodworking activities in northern Illinois, 2) to facilitate communication and cooperation among area woodworkers, 3) to provide sources of information, materials, equipment, supplies and facilities for area woodworkers, 4) to provide educational opportunities for those desiring to begin or improve skills in various phases of woodworking, and 6) to provide voluntary public services to the community by area woodworkers.

Regular meetings are held and have

(Continued on page 10)

included demonstrations, movies, and speakers. Speakers have included a saw mill operator, a fourth generation cabinetmaker, decoy carver, salesman from a finishing company, professional woodcarver, and an author and professor of wood technology. Also member's projects are regularly on display at each meeting.

Special interest groups meet monthly in the home/shop of one of the members. Current interest groups are refinishers/finishers, carvers, and woodturners. Displays or work have been presented at a Christmas Show and at the DeKalb Chamber of Commerce Spring Show.

A monthly newsletter keeps members informed about woodworking activities and events. Club t-shirts and an official logo identify the organization and its members.

Community service and education are an important part of Kishwaukee Woodworkers. Projects include: annual Kishwaukee Woodworker's Scholarship Award to an area high school junior, senior, or recent graduate, repairing picture puzzles and toys for elementary schools, publishing an area Woodworker's Directory, encouraging local libraries to subscribe to woodworking periodicals, and mass producing wooden toys for distribution to low-income children at Christmas.

Meetings are free and open to the public on the 3rd Thursday of every month at 7:30 p.m. in the New Commons of DeKalb High School. Membership is available (to help support the newsletter and other projects) at $10/year and $5/year (full-time students and senior citizens).

For more information contact: Doug Hicks, Kishwaukee Woodworkers, 420 Oak Street, DeKalb, IL 60115.

Do you know of a woodworking club in the Los Angeles/Orange County area?

Michael Wolter, Fountain Valley, CA

We don't but maybe our readers do. If we learn of one, Michael, we'll be sure to let you know.

Atlanta has a "Woodworker's Guild" (mail address Box 5592, Atlanta, GA 30307) that meets at Highland Hardware, 1034 N. Highland Ave., N.E., Atlanta, GA 30306 about once a month. Membership fee is $10.00.

Art Young, Decatur, GA

In the July/August 1982 issue you published a letter from me requesting information about a source of wood turnings that I wanted in order to complete certain projects. I was overwhelmed by the response from so many of the readers and cannot possibly answer each one personally. I would like therefore, to make this one expression of thanks to you and to each of the people who wrote to me.

Ken Bachand, Indialantic, FL

I would like to build Shaker-style ladder back chairs. Can you suggest any books that will provide helpful information?

C.H. Dahlhamer, Hagerstown, MD

Here's a list of several that we think you'll find useful:

The American Shakers and Their Furniture *(with measured drawings of museum classics), by John G. Shea, Van Nostrand Reinhold Co.*

How to Build Shaker Furniture *by Thos. Moser, Drake Publishers.*

Make a Chair From a Tree: An Intro-Duction to Working Green Wood *by John D. Alexander, Jr., The Taunton Press.*

Shop Drawings of Shaker Furniture *by Ejner Handberg (3 volumes), The Berkshire Traveller Press.*

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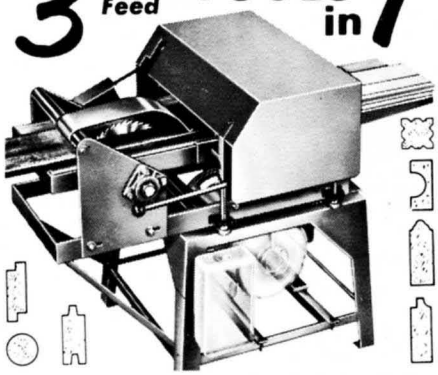

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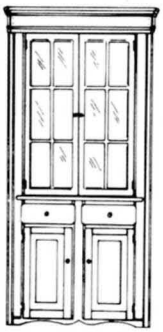

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Cabinetmakers' Supplies

As a service to our readers, *The Woodworker's Journal* periodically lists sources of supply for various woodworking products. In this issue we are listing companies that specialize in mail-order sales of woodworking supplies, along with a code to indicate some of the products they carry. Code: hand tools (HT), power tools (PT), stationary equipment (SE), hardwoods (HW), veneers (V), hardware (H), clock parts (C), lamp parts (L), books (B), finishing supplies (F).

Barap Specialties 835 Bellows Ave. Frankfort, MI 49635	H, C, L, F 46 page catalog $1.00
Conover Woodcraft Specialties 18125 Madison Rd. Parkman, OH 44080	HT, SE 24 page catalog $1.00
Constantine 2050 Eastchester Rd. Bronx, NY 10461	HT, HW, V, H, C, L, B, F 104 page catalog $1.00
Craftsman Wood Service 1735 West Cortland Ct. Addison, IL 60101	HT, HW, V, H, C, L, B, F 144 page catalog $1.00
Fair Price Tool Co. P.O. Box 627 La Canada, CA 91011	HT, B 24 page catalog $1.00
The Fine Tool Shops 20 Backus Ave. Danbury, CT 06810	HT, PT, B 100 page catalog $1.00
Frog Tool Co., Ltd. 700 W. Jackson Blvd. Chicago, IL 60606	HT, B, F 100 page catalog $2.50
Garrett Wade 161 Ave. of the Americas New York, NY 10013	HT, SE, B 212 page catalog $3.00
John Harra Wood & Supply 511 West 25th St. New York, NY 10001	HT, PT, SE, HW, B, F 60 page catalog $3.00
Lee Valley Tools, Ltd. 857 Boyd Ave. Ottawa, Ontario Canada K2A 2C9	HT, B, F 130 page catalog $2.00
Leichtung, Inc. 4944 Commerce Parkway Cleveland, OH 44128	HT 120 page catalog $1.00
The Princeton Co. P.O. Box 276 Princeton, MA 01541	HT, PT, B, C, F 80 page catalog - free
The Toolworks 111 8th Ave. New York, NY 10011	HT, H 48 page catalog $2.00
Woodcraft Supply Corp. 41 Atlantic Ave. P.O. Box 4000 Woburn, MA 01888	HT, HW, C, B, F 128 page catalog $2.50
Woodline/The Japan Woodworker 1731 Clement Ave. Alameda, CA 94501	Japanese Hand Tools 49 page catalog $1.50
The Woodworkers' Store 21801 Industrial Blvd. Rogers, MN 55374	HT, PT, HW, B, C, F, V, H 112 page catalog $1.00
Woodworker's Supply of New Mexico 5604 Alameda, N.E. Albuquerque, NM 87113	HT, PT, B, F 32 page catalog $2.00

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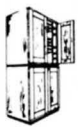

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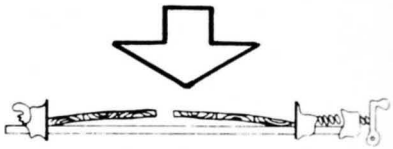

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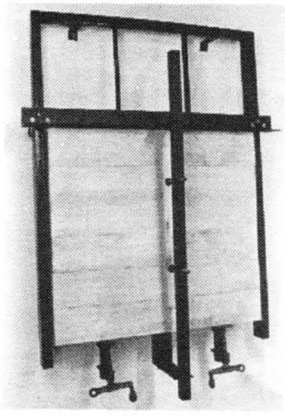

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Workshop Income

by Paul W. Kellam

Don't Sell For Less Than Cost

Remember that 19th Century Step-Chair project from the May/June 1982 issue of *The Woodworker's Journal*? Bill, a friend of ours, decided he'd build one for his wife. It turned out well. She loved it and showed it off to some visitors.

Then Bill got a telephone call from a dealer in antique furniture. "My wife saw your wife's step-chair," the caller said. "If it's as good as she says it is would you be interested in making a few to sell in my shop? Not as antiques, you understand. We'd identify them as recently made, but hand made. People want well-crafted things that look old but can also be used."

Bill was delighted and so was the antique dealer when he saw the step-chair. He placed a verbal order for four, to be followed by more as soon as the first two sold. They left the price open until Bill could sit down and figure his costs.

The materials cost was the easy part of it - 14 board feet of oak at $1.175 per board foot. Labor was a bit more difficult, but with his wife's help, Bill came up with a fairly accurate estimate of the time he'd spent on the project. Building the chairs four at a time, he figured, should pare that to five hours per step-chair. At $10 an hour that came to $50 per chair. He calculated the finishing materials at $5 and added $10 for miscellaneous and profit. It all came to $81.45.

"At that price, I'll take eight," the antiques dealer said. "I'll mark them up to $135 and they'll sell like hot cakes. When will I have the first one?"

What Bill didn't realize was that he was going to take a bath on each and every step-chair. He was right in that the retail price is not his deciding factor; the wholesale price is. What Bill didn't grasp was that the wholesale price he'd set in this case was less than his cost.

In his calculations Bill forgot a very important item. He forgot overhead. You can say that it doesn't matter because Bill isn't dependent on his woodshop for his living; he has another job. But he does need some extra income and he's not going to get it from this step-chair deal. Indeed, for each and every step-chair he sells he's going to incur a loss.

You'd be surprised how many small businessmen sell at a loss every day and don't know they're doing it. When things don't come out right at the end of the year, what do they typically do? They look for ways to increase sales, and that of course only increases the loss.

There is a way to avoid that. It's called unit-cost pricing. It's fairly simple and here's how it works.

To go back to the step-chair example, let's start with Bill's production cost figures. Broken down, they look like this:

14 board feet of oak @ $1.175	$16.45
5 hours of work @ $10	50.00
Finishing materials	5.00
Total, labor and materials	$71.45

Now let's assume for the moment that Bill has no other income. Aside from labor and materials, how much would his shop cost him to have and to operate full time for a full year? Here's what Bill came up with:

Heat	$400.00
Electricity	360.00
Truck operation (gasoline, oil, insurance)	810.00
Insurance on shop and tools	400.00
Total, operating expense	$1,970.00

That's only part of it. His tools represent an investment of $10,000, and he's got $8,000 tied up in the truck. Figuring a life of five years if the tools and truck were in full-time service, that means Bill's shop would have to yield $3,600 a year ($18,000 divided by 5) above materials and labor costs just to keep the equipment up to snuff.

(Continued on Page 16)

FINEST QUALITY

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Our Sheet Metal and Wood Screw Assortment pictured above is one of those items.

It's not intended to be the largest assortment on the market, although it is larger than some we've seen. Nor is it the least expensive, although it does cost less than some. Our Sheet Metal and Wood Screw Assortment does include, however, a very substantial 1,050 pieces of industrial-quality hardware that are all plated to resist corrosion.

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In short, I think we have the finest assortment available anywhere. Items that won't rust right before your eyes. Pieces that won't strip when you put some muscle on them. Sizes that make some sense!

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But maybe the thing that fascinated you most about the picture at the top of this ad is the box we pack our Sheet Metal and Wood Screw Assortment in. It's the neatest heavy-duty steel box I've ever seen. It can be latched and carried with you to the job. And that means no more fumbling around with glass jars filled with odds and ends. No more searching through rusty coffee cans only to discover you have to go back down the basement to get the right one.

Our 16-compartment box is manufactured of prime cold rolled steel, with a good strong latch and full-length cover hinge. When latched, the cover fits snugly, so items won't spill from one compartment to the other. Even the compartment bottoms are rounded to allow for easy removal of parts.

The box is finished in rust- and acid-resistant baked enamel in your choice of four colors: Medium Blue, Metallic Gray, Desert Tan, or Satin Black. It measures 13½"W x9¾"Dx2-1/8"H and weighs a hefty nine pounds including the fasteners.

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But I want you to see, up close, our quality. So order your own Sheet Metal and Wood Screw Assortment and carry-box and look it over piece by piece. Then decide if you want to keep it. If for any reason you're not satisfied, return it in original condition within 15 days and we'll refund your money. No questions asked.

To order, just fill in the order form below and send it to us with a check or money order. Visa or MasterCard holders call toll-free **1-800-253-0405** (in Michigan call 1-800-632-0165). When ordering by phone, it's helpful to have the order form filled in and our item number handy so our operator can give you faster service.

Order yours today. It's a hardware value you'll appreciate for years to come.

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Reid Tool Supply Company

Workshop Income (Cont'd)

And there's more - general supplies, like sandpaper, general expenses like telephone, and such things as advertising, selling, bookkeeping, plans books, subscriptions, etc. - things that are necessary and cost real dollars but can't easily be allocated to each item produced. Bill figured that if he were operating his shop full time all that might add up to about $2,400 a year.

Summarizing it all, Bill came up with the following:

Operating expenses	$1,970.00
Replacement of tools and truck, per year	3,600.00
Miscellaneous	2,400.00
Total	$7,970.00

In his original figuring, Bill had allowed $10 per step-chair for what he called profit, remember? He had allowed nothing for overhead. If Bill were to forego profit and allocate that $10 per unit for overhead he would have to make 797 step-chairs a year just to break even.

To put it another way, each step-chair is going to take five hours of work. Five hours times 797 step-chairs is 3,985 hours of work producing step-chairs in order to break even on overhead, materials and labor. There are only 2,080 work hours in a year of 40-hour weeks, assuming that you're never ill, forego all holidays, and take no vacation. Just to break even Bill has to either produce 15 step-chairs a week (at five hours per unit that's a 75-hour week) or he has to get more per step-chair. And no consideration has yet been made for profit. How much must he get per step-chair if he is to cover all expenses and also make a profit? How much profit should Bill aim to get?

Bill decided to look at profit conservatively. "I have $18,000 invested in tools and truck," he said. "If I were to invest that money some other way I should be able to get 12 percent. Twelve percent of $18,000 is $2,160." He added that number to his $7,970 for overhead expenses and came up with a total of $10,130. Dividing this by 2,000 work hours per year yield $5.065 needed per hour to cover profit and overhead.

Since each step-chair takes five hours to make he needs to get $25.33 per chair (5 times $5.065) in addition to materials and labor costs. Materials and labor were calculated to be $71.45 per step-chair. So Bill called his antiques dealer and said, "I'll make the first eight for $81.45 each, as we agreed, but I'm going to have to get $100.00 for any beyond that in order to cover overhead and profit."

"No problem," said the dealer. "I've already sold two for $150 each just from the Polaroids I took. I can get $175, perhaps $200. No problem at all. Just make 'em.

As we said, Bill is not dependent on his woodshop for his living, and since his first price did cover his materials and labor he was not going to be out of pocket even if he sold for less than his real overall cost. It could be argued that anything one gets from a hobby woodshop beyond the cost of materials is found money, since the shop is already there. It can also be argued that making a few sales even at bare materials cost is simply a means of providing recreation at no expense. There are also tax considerations that can offset the real cost of selling at a loss.

All that is fine, as long as one accepts the fact that he is subsidizing the creation of step-chairs for the enjoyment of others. If you want to make step-chairs for the heck of it, fine. Go to it; you could forget cost entirely and give them away. But if you want income from your woodshop you have to add up all of the costs before you can set the price.

And it is you who has to set the price; you can't let the market do it for you and expect not to sell at a loss. You're the only one who can determine the cost, and from that determination must come the price. If the market won't meet your price then perhaps you're making the wrong item. Some items simply aren't profitable to make. Or the item may be okay, and your costs are out of line.

Next issue we'll look at ways to get costs down. Trimming costs is often a better way to profits than increasing price. The point is that unless you figure your costs thoroughly and realistically you can't know whether they're out of line, much less figure how to cut them back.

Restoring Antiques

by John W. Olson

More Finishing Tips

There is a basic woodfinishing rule that should always be kept in mind: the final finish that is obtained will be no better than the surface to which it is applied. This rule applies not only to furniture, but also to cars, boats and just about any other product to which a finish is applied. Surface preparation is the key to obtaining a really good finish.

When finishing furniture, surface preparation doesn't stop when you stain or apply filler, or add the first coat of clear finish or paint. It is something that must be kept in mind throughout the finishing process. Before, during, and after each step, every effort must be made to keep the surface as smooth and as blemish free as possible. Each layer of finish must be prepared to accept the next one.

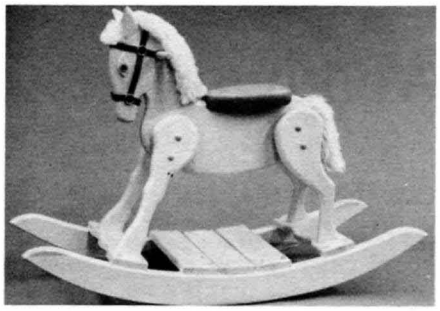
The wood surface must be smoothed in steps using progressively finer grits of sandpaper. Most planed surfaces are fairly smooth, therefore the sanding process can usually begin with 100 grit aluminum oxide paper, then proceeding progressively through the finer grits: 120 - 150 - 180, etc. With soft woods, such as pine, final sanding can be with a 180 or 220 grit paper. Finer grits can be used, of course, but it is wasted effort to work beyond the limits of the material at hand. Nearly all wood species are too soft to be smoothed to the same degree as metal or plastic. However, some hardwoods can be smoothed to 300 or finer grit.

It is absolutely imperative to remove the scratches left by the previous grit. Any scratch or blemish left while smoothing the surface becomes immediately apparent when the first coat of clear finish is applied. There is no satisfactory way of correcting such scratches and blemishes, short of removing the finish that has been applied and starting all over again with sandpaper. Therefore, it is most important that the original surface be as smooth as possible before filing and/or staining.

If a filler is used, be sure to carefully wipe it off and rub down with a clean, soft cloth. Make sure all excess material is removed before proceeding to the next step. This cleaning of filler must be done with great care, so as not to drag the material from the pores of the wood. It must also be done before the filler sets up if the surface has been stained. A filled surface that has not been stained can be cleaned of excess filler by using sandpaper of a grit that is as fine, or finer, than that used in the last step of the original sanding. A surface that has been stained cannot be sanded. The only result will be blemishes that cannot be corrected satisfactorily.

Before going any further, I would like to say a word or two about my favorite finishing technique for really hard woods. Walnut, cherry, some oaks, the hickory family (among which is pecan), and many imported hardwoods have physically hard surfaces. By using progressively finer grits of sandpaper (as described above) through a 400 or finer grit, these wood species can actually be polished. This polishing can be carried even further by burnishing the surface with very fine (0000) steel wool.

Especially fine-polished surfaces can be obtained by burnishing pieces in the lathe. On flat surfaces, you can get the same results by using a rotary polishing machine with a 0000 steel wool pad. The polisher should not rotate at more than about 1500 rpm with a 7" pad. Larger pads will require slower (fewer) rpm's to prevent burning or otherwise harming the surface. These burnished surfaces are especially beautiful when waxed and polished. A very high degree of polish will result if the wax is applied and polished using the lathe and polishing machine.



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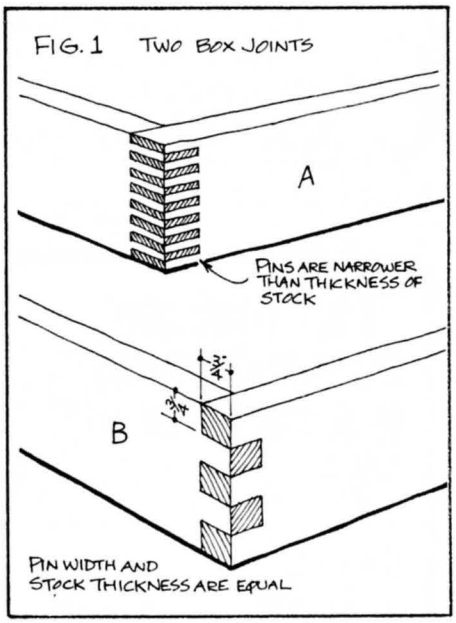
The Beginning Woodworker

All About Box Joints

The box joint, or finger joint as it's sometimes called, is the machine equivalent of the handcut dovetail joint. Though the box joint lacks some of the charm of the dovetail, it has a functional, no-nonsense beauty of its own. It's also a strong joint as the many pins provide a large area of long grain gluing surface.

With a table saw, dado head and simple jig, perfectly fitted box joints can be produced easily and quickly. The joint can be cut with hand tools, especially if the pins are of large size but the process is tedious and a dovetail joint would be a better choice. The radial arm saw is not suitable for cutting box joints as the required setup, with the blade in a horizontal position, is both impractical and dangerous.



Once you've decided to use a box joint the first step is to determine the width of the boards to be joined and how many pins and slots should be cut. A pin size should be chosen that will present the most attractive appearance. Generally pins look best when they are considerably narrower than the thickness of the workpieces (Fig. 1 A & B). When working with stock of ½ to ¾ inch thickness, a pin width of ¼ to ⅜ inch looks good. With stock of less than ¼ inch thickness, substitute a ripping blade for the dado head and let the width of the blade (usually about ⅛ inch) determine the pin width. Pins that are equal in width to the thickness of the stock present a checkered effect that somehow looks dull and too mechanical (Fig. 1B).

In laying out the pins and slots on a board cut to finish width it soon becomes obvious that it's not often possible to fit an equal number of pins and slots across the board and have them all equal in width. If, for example, you have two ¾ x 2½ inch wide boards to be joined and you decide to use a box

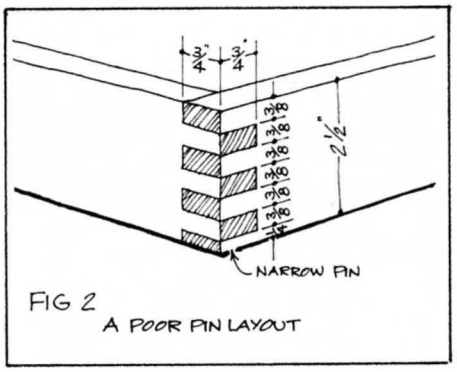


FIG 2
A POOR PIN LAYOUT

joint with ⅜ inch pins and slots, it's obvious that no multiple of ⅜ inch will result in 2½ inches. In other words, you'll end up with three pins of ⅜ inch width and one pin of ¼ inch, which will not look too good (Fig. 2).

One solution is to switch to a pin width of ¼ inch. This will result in an equal number of pins and slots. The joint will be perfectly strong but will present a slightly disturbing unbalanced look (Fig. 3A). It's a subtle distinction but the joint that shows an unequal number of pins on each side

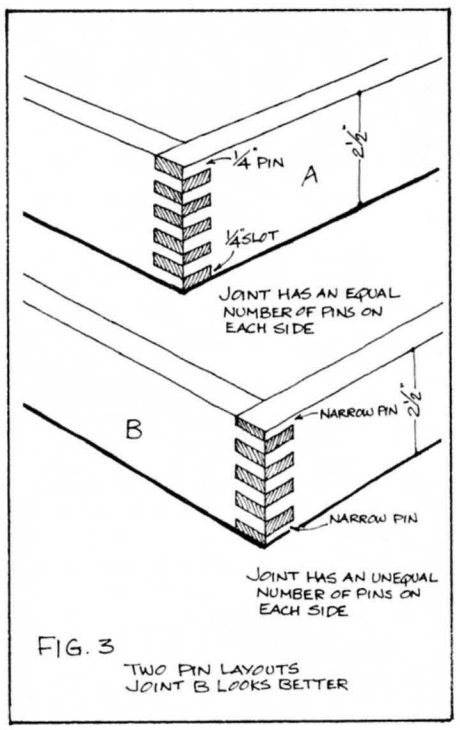


FIG. 3
TWO PIN LAYOUTS
JOINT B LOOKS BETTER

presents a more resolved and visually satisfying effect (Fig. 3B). If you do not feel that this difference is worth being concerned about, go ahead and space your joints as in Fig. 3A. The townspeople will not come carrying torches to burn down your shop and drive you out of town.

If you wish to strive for perfection and cut nicely balanced box joints, the easiest approach is to start with boards a bit wider than the finish width. Using ⅜ inch pins and a 2½ inch finish width as an example, lay out full width pins and three slots (Fig. 4A). Do the same for the mating board except that you start with a slot instead of a pin (Fig. 4B). After the boards are slotted with the table saw and jig, you can rip 1/16 inch off each edge of both boards to get your finish width of 2½ inches. What you'll also get is a nice looking joint with thinner, but equal pins at both ends (Fig. 4C).

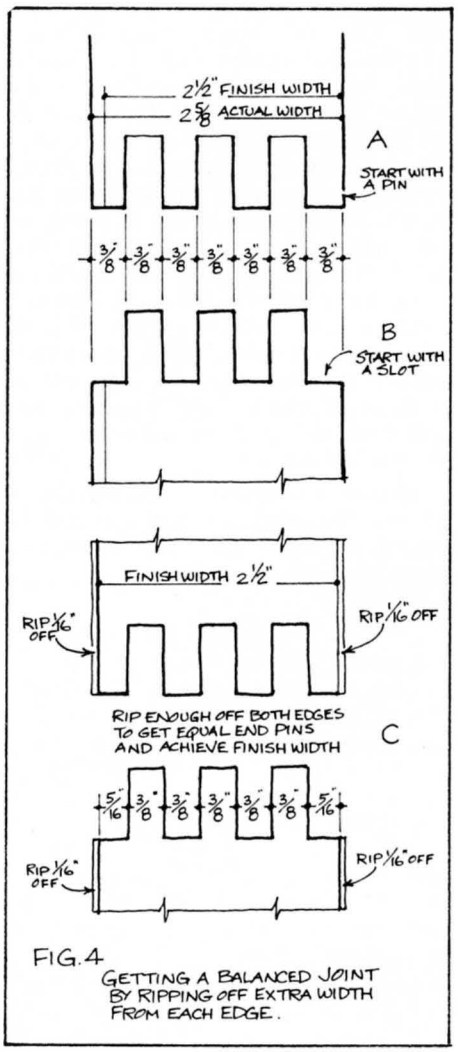


FIG. 4
GETTING A BALANCED JOINT BY RIPPING OFF EXTRA WIDTH FROM EACH EDGE.

In actual practice you won't have to actually lay out the pins and slots. Just start with a wider board, cut more pins than you need leaving the last pin wide (instead of ending with a partial slot), then trim both edges for the best balance. Sometimes trimming the pins at each end would result in two very thin

(continued on next page)

pins. In these cases it's better to leave a slightly wider pin at the end instead. The main two points to remember are: 1) to end the joint with a pin at each end and 2) to balance the joint if possible by trimming the end pins equally.

Let's turn our attention now to the construction of the jig and the procedure involved in using it. The jig is merely a board with two slots, one of which contains an index pin. We'll call it a key to avoid confusing it with the pins of the joints.

A piece of ¾ inch plywood is best to avoid warping problems and because the small section between the two slots is less likely to break off. The dimensions of the jig are not critical. It should be wide enough so that it can be screwed to your miter gauge and provide a good backup surface for the workpiece. A good length for a 10 inch table saw with table extension would be about 18 inches.

Set your dado head to cut a slot equal to the desired pin width (in this example, we will use a pin width of ⅜ inch). The dado height is set just a tiny bit higher than the thickness of the workpieces. If your stock will be ¾" thick, set the cutter height 1/32 inch higher than ¾". This will guarantee that the pins will be slightly long and can later be sanded flush.

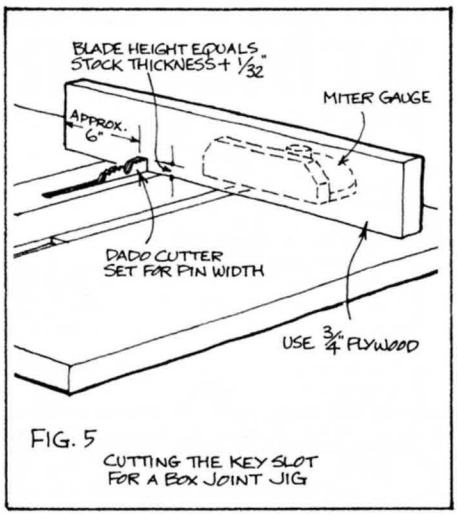


FIG. 5 CUTTING THE KEY SLOT FOR A BOX JOINT JIG

Carefully check your miter gauge to make sure it's set at exactly 90 degrees, then turn on the saw and make a pass over the dado head to cut a slot about 6 inches from the end of the jig (Fig. 5). Now rip a 4 inch long piece of dense hardwood such as maple so that it fits *exactly* in the slot. The fit of this key in the slot is very important for a good box joint. The key should fit snugly enough to stay in place.

Cut the maple key in half and place one piece into the slot so that it is flush with the back of the jig. With the saw turned off, place the remaining piece on edge against the blade and move the miter gauge and jig toward the blade so that the key is against this spacer (Fig. 6). Incidentally, if you use an adjustable dado cutter, the kind that has a dial to set the width of the

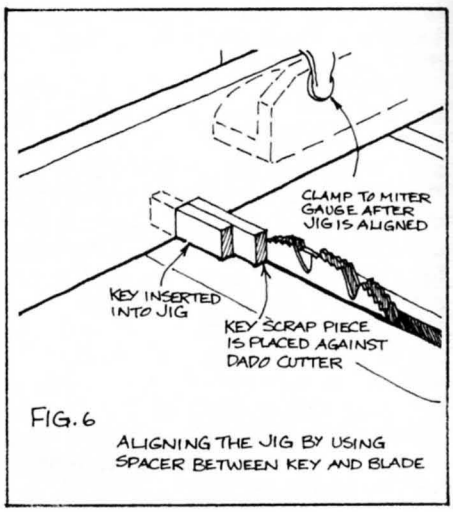


FIG. 6 ALIGNING THE JIG BY USING SPACER BETWEEN KEY AND BLADE

cut, you will have some difficulty aligning the spacer with the blade as these blades rotate while tilted on the arbor. You will have to rotate the blade by hand to find the tooth that cuts to the extreme right (standing in front), and align the spacer and key from that tooth. Because the width of cut is set on a dial that is usually not too accurately marked, you may find it difficult to set the blade exactly right. The best kind of dado cutter consists of a set with identical outer blades with spacer blades set between. Various combinations of blades and spacers give different widths of cut and once set up they never vary.

Ideally, you have now located the jig so that the next slot you cut will be exactly one key thickness from the first

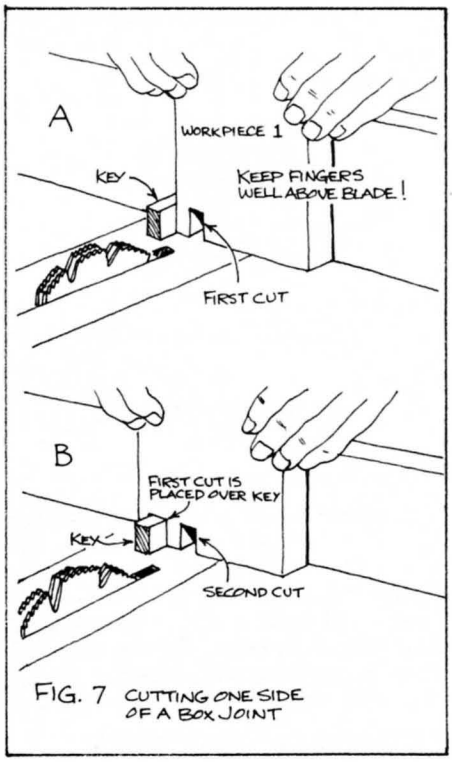


FIG. 7 CUTTING ONE SIDE OF A BOX JOINT

slot. Clamp the plywood jig to the miter gauge and test the jig with a couple of pieces of scrap the same thickness as your workpiece and 1⅛ inches wide.

To start the joint, butt the board against the key and while holding it firmly against the miter gauge, run it over the dado head (Fig. 7A). After the first slot is cut, position the workpiece with the slot over the key and cut another slot (Fig. 7B). If you were working a wide piece you would continue by placing each successive slot over the key.

This test piece starts out with a pin and because of its width, gets two slots and ends with a pin. To cut the mating piece (which will start and end with a slot), place the first board against the jig with *the first* slot you cut positioned over the key. Butt the second board firmly against the first and cut the first slot (Fig. 8). The remaining slots are cut by again moving the board and setting each slot over the key, just as you

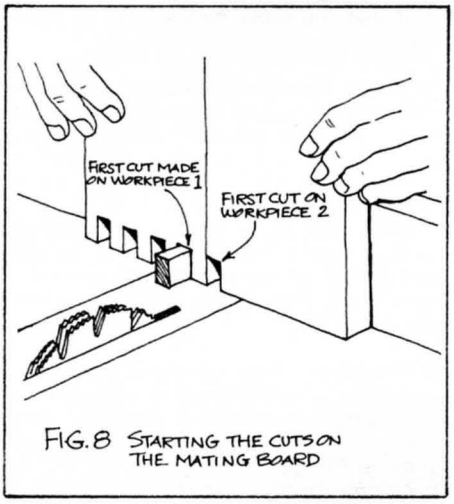


FIG. 8 STARTING THE CUTS ON THE MATING BOARD

did for the first board.

The joint should go together with a slip fit. If it's too tight, the addition of glue will make it even more difficult to get together. In this case, loosen the clamp and shift the jig so that the key is closer to the blade to cut a thinner pin. If the test joint is too loose, move the key away from the blade.

When you are satisfied with the jig, hold it with a clamp and use two round head screws to fasten it to the miter gauge. Most gauges have slots or holes for such purposes. If your gauge lacks these, you will have to drill two ¼ inch holes to take the screws. The jig must not be moved while fastening it to the miter gauge, otherwise it will be inaccurate. You may have some difficulty in getting the jig just right the first few times....or you may be lucky and get it "right on the money" the first time. Be sure to glue the key into the slot.

This jig will be good only for cutting

(Continued on page 25)

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3/8 inch pins and should last quite a while provided the screw holes don't get sloppy. Also take care to see that the slot next to the key doesn't get gradually higher by carelessly elevating the dado head. This will cause unsightly chipping from the back side of the workpiece.

If you've got four boards to join to form a box, you can slot the ends of two pieces held together, then turn them around and work the other ends, remembering to start with pins on one set and start with slots on the mating set.

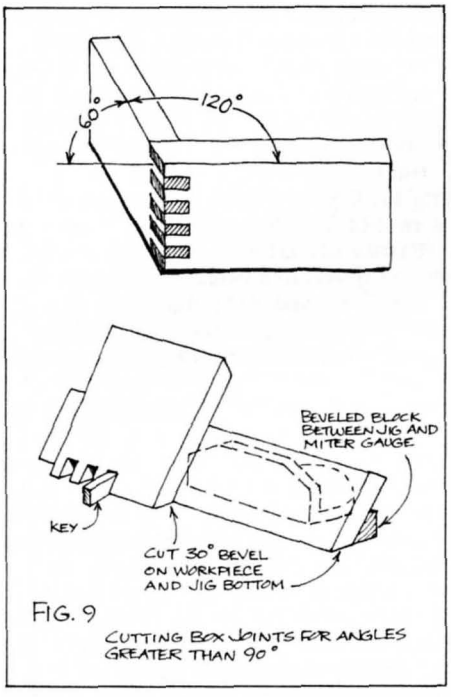


FIG. 9
CUTTING BOX JOINTS FOR ANGLES GREATER THAN 90°

When a box joint is needed with a joined angle of more than 90 degrees, it can be made in the same way as a square joint except that the workpiece ends and the jig are beveled as shown in Fig. 9. In this example, a 120 degree joint is shown, thus the tablesaw blade would be tilted 30 degrees.

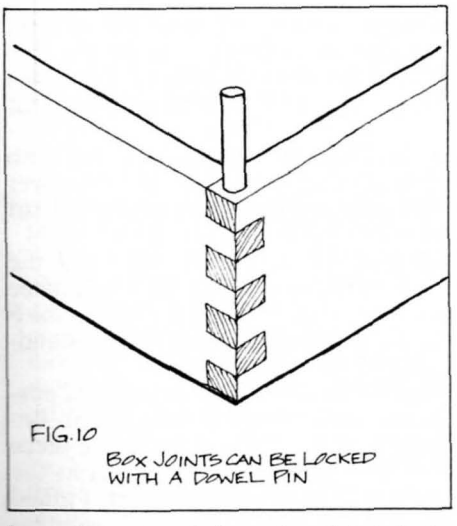


FIG. 10
BOX JOINTS CAN BE LOCKED WITH A DOWEL PIN

A good way to reinforce box joints is to drill through the assembled joint and insert a dowel with a little glue.

Lyre Clock

by Roger E. Schroeder

Photo by Author

The basic design of this lyre clock is attributed to the famous clockmaker, Aaron Willard Jr., who was born in the late 1700's and lived most of his life in Boston.

The clock I built is made entirely from scrap wood that consisted of maple, Honduras and African mahoganies, pine from a turn-of-the-century pew, mahogany from a broken-up antique sewing table I found on a neighbor's wood pile, and striped mahogany and crotch veneers. It measures nearly 38 inches from finial to finial, is 12 inches wide and 5½ inches deep.

Begin this project with the sides, parts A. I chose pine because it would reduce the weight of the clock, and since the mechanism case would be bolted into the end grains of the sides, the strength offered by a hardwood wasn't a critical factor.

Two pieces of 1¾" thick pine 14" x 3" wide glued face to face will be needed. A cardboard template will help so that each half can be roughed out on a bandsaw before gluing. Be sure to leave extra wood at the top and bottom. A drum sander on a radial arm saw or drill press will finish shaping the contours. Since the sides will be veneered, imperfections can be filled in with wood filler. A smooth surface is necessary, so the final sanding should be done by hand.

The bottoms of parts A will have to be cut at 10 degree angles, and rabbets ⅜" wide by ¼" deep for the back panel, part B, can be made with a router.

The back panel, made from cabinet-grade birch plywood, will have its sides tapered 10 degrees from a base that measures 7¾ inches wide. To do this, I set my taper jig at 10 degrees, starting with a piece of plywood at least 8 inches wide by 13 inches long. I then ripped the panel on one side. My taper jig goes only to 15 degrees, however. When cutting symmetrical sides, the angle has to be doubled for the jig when the panel is turned over. So I taped the waste piece from the first cut to one side and ran it through the saw again. When finished, I screwed panel B, using ¾ inch #5 flathead brass screws, to parts A and set the assembly aside.

Start on the mechanism case, part C. This too is going to be veneered, so solid mahogany is not necessary, but a hardwood should be used since it has to hold a fair amount of weight. I would recommend two pieces of 1¾" thick maple glued face to face with a ½" thick piece of mahogany glued to the front. The mahogany will eliminate veneering the front. Be sure to run the grains in the same direction.

I glued the three laminated pieces to a piece of ¾ inch plywood, newspaper between, and attached the wood to a face plate. Once I turned the wood to a 7½ inch diameter, I used a parting tool to take out the center, leaving the walls of the case about 1⅛" thick.

To get a nicely fitting back panel, part D, I again used a parting tool and cut a rabbet ¼" deep x ¼" wide into the back of C. Removing it from the lathe, I replaced it with a ¼" piece of birch plywood glued to a piece of ¾" plywood, newspaper between. This I turned to a diameter slightly larger than the diameter of the recess I made in the back of C, and, checking it with C, finished turning it down until I got a snug fit.

The front panel, part E, a piece of ⅜" plywood that holds the mechanism, does not need as accurate a fit as D, as the bezel will cover it, so the rabbet for it can be made with a router and and a ⅜ inch rabbet bit. But E should be turned round on a lathe so its exact center can be located. This will determine where the handshaft of the movement will be. E is held to C with 1" No. 5 flat head screws.

A hole will have to be made in C for the pendulum to fit through. This I made 2 inches wide by 2 inches deep. Drawing the outline on the outside diameter, I drilled holes into the four corners and cut out the piece with a jigsaw.

Part C can be set aside so work can begin on the carved front, part F. A piece ½" thick x 11" wide x 13" long will be needed. A solid piece of lumber instead of a laminated one will be more stable and will not show the glue lines. I'd recommend Honduras mahogany since its grain is excellent for carving.

Take the waist of the clock, parts A and C, turn them panel side down on the mahogany board, and draw the outline for part F. What you must add, however, are the flares at the bottom.

When you cut F to shape, don't go inside the outline. Using 1¼" wire brads spaced about every 3" along the outline and ½" in, attach F to the front of parts A. But don't drive the nails all the way in as you'll want to remove F for carving.

Take the assembly to the drum sander and flow in F with the sides, using a fine grit sanding sleeve. I taped the lower portion of the sleeve with masking tape so it would not cut into the sides of parts A.

Next comes the joining of the mechanism case and the clock waist. Determine the vertical centerline of F and place the lowest portion of C at a point 11½" from the bottom of F on that line. Outline the diameter of C with a pencil. Bandsaw along the line, leaving a little extra wood.

What I discovered was this: hand tools and repeated passes with the sanding drum could not insure a good fit between the case and waist. What I did was lathe turn a piece of glued-up pine 4 inches thick to the same diameter as the housing, which is 7½ inches. Using contact cement, I glued a 4 by 24 inch sanding belt to the pine. I then had a sanding drum the same size as the case. The drum had a tendency to kick back the work, but with practice on a thick piece of

scrap wood, I was able to get a good fit by holding the waist assembly to the drum.

The next problem was joining part C to the waist. This was solved with ¼" x 3" long lag screws. I chose them because they're stronger than wood screws and can be tightened with a ratchet wrench. To determine part C's position, I drilled shallow ¼" dia. holes into the tops of parts A and put ¼" dowel centers into them. Once the holes were located on C, I drilled slightly enlarged holes (oversized holes will allow for better positioning so long as they aren't bigger than the heads of the bolts) for the lag bolts and continued the holes into parts C.

The next section to be tackled is the pendulum cabinet. Because of the weight of parts L and M, I chose dovetail joinery for the cabinet parts. First, dovetails are extremely strong; second, the cabinet sides will be veneered, so the dovetails won't take away from the clean lines of the clock.

Dovetails are not as difficult to make as they seem. And if you are not experienced and don't make them fit perfectly, wood filler will fill in the imperfections and the veneer will cover them.

In my scrap pile were pieces of old ½ inch African mahogany. I used this wood so I would have to veneer only the outside of the case. But another hardwood such as maple or poplar can be substituted.

Before gluing up the sides, parts H, and the top and bottom, parts G and I, you'll have to cut a hole into G for the pendulum rod. Into part I you should make countersunk holes for the 2¼" No. 8 flathead wood screws that will hold the lower shelf section that comprises parts L, M, N and O.

Part J, the back panel, is made after parts G, H, and I are joined and glued together. The groove for this ¼" thick piece of birch plywood is made with a ¼ inch rabbet bit in the back of the case with the corners squared with a chisel. The panel is held with ⅝" No. 3 brass flathead wood screws.

Part L is a ¾" thick piece of solid mahogany. The front and side edges can be rounded with a ⅜" beading bit. Part M can be made from any wood either solid or glued-up since it will be entirely veneered. A bandsaw can probably make all the curves, but since I used a hardwood, I ran the front over a table saw, making repeated passes over the blade and finished it up with a cove plane and sandpaper.

Part N is a piece of ⅛" thick mahogany. This can be ripped from the edge of a thick piece of mahogany. The front and side edges are rounded on a sanding disc.

Part O was made from two pieces of 5/4 mahogany glued together with newspaper between. After turning the block on a lathe with a 1-inch diameter tenon, I separated the pieces with a sharp chisel, clamped one half in a vise and cut a dovetail on the tenon with a dovetail saw. After M is veneered and N is glued to the bottom of M, the dovetail can be outlined on the back of M and N and cut out. Attach L to the top of M with four 1¼ inch No. 8 flathead wood screws countersunk into the wood. This entire shelf assembly is attached to the bottom of the pendulum case after the veneering is done, with 2¼ inch No. 8 flathead wood screws countersunk into the bottom of part I.

Before carving the front, part F, I would veneer the sides, the pendulum cabinet, the mechanism case, the door and the shelf, part M. At a local lumber company I purchased matching striped mahogany veneer, a package that had five pieces, each measuring 5 inches by 36 inches. This was more than enough for the entire project.

The secret of veneering is a very smooth surface and lots of contact cement, Wellwood Cement being the best I've used. Start with the sides, parts A, and give at least two coats to both the wood and the veneer. When the surfaces have dried to the touch (at the very least, a half hour), put a newspaper between the wood and the veneer and slowly pull the newspaper out while pressing down on the veneer. I found a length of 1½" dia. dowel served well as a veneer roller. The veneer should overlap the edges of the wood being veneered since it can easily be trimmed with a razor knife. For the case, part C, I began the veneer at the exact bottom and rolled the case over a length of veneer that was a little over 24 inches long. The veneer will stop adhering when it reaches its beginning. All I needed to do was trim the overlap with the knife.

Part M can be veneered on all sides, even over the sharp horizontal edges. The veneer should be glued with the grain running horizontally, and where it must fold over the sharp edges it will crack but won't separate. The veneer can then be trimmed and sanded flush.

Once the pendulum cabinet is veneered, you can put together the shelf assembly with glue and screws and cut out for the dovetailed lower finial, part O. The pendulum cabinet is then attached to the waist with ¼ inch by 2 inch lag bolts. Dowel centers will help position these two sections.

At this stage I built a stand out of 5/4 lumber to stand the clock upright while I worked on the door and fitted the mechanism.

The door of the pendulum cabinet (K) is the next part to be constructed. The one on my clock was also ½" African mahogany. But if you choose another wood it should be fairly stable and warp free. This you can tell by the end grain. If the growth rings are seen as arcs on the edge of the board, it's more likely to warp than a board on which the rings appear as lines that run up and down from top to bottom.

(Continued on page 28)

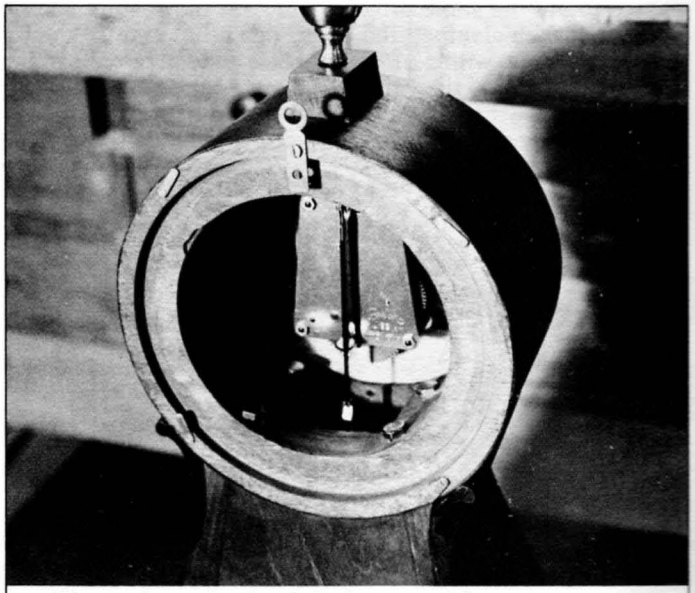
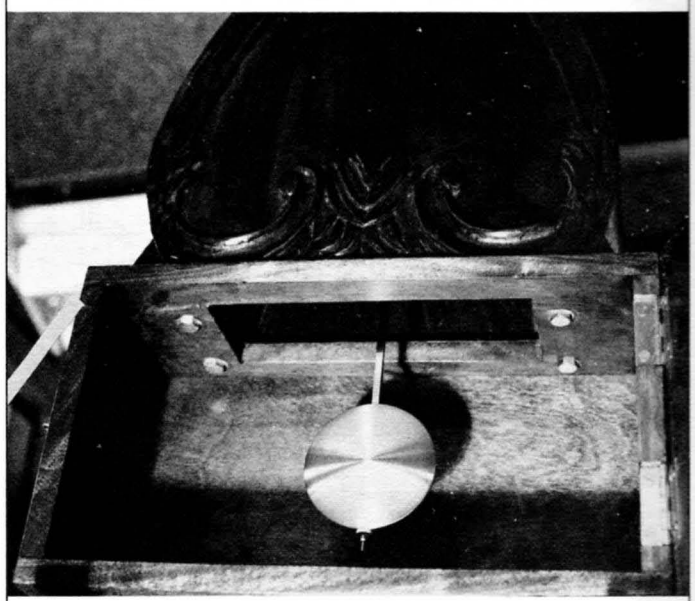


Photo shows back of clock case with cover removed. Note the 2 x 2 inch cut-out for the pendulum shaft and the four lag screws joining the lower case.



With the pendulum cabinet door open, the opening in the top of the cabinet can be seen. Note also the lag screws joining the cabinet to the upper case assembly.

Photos by author

If you veneer the door as I did, you must do both sides to equalize the absorption of moisture from the air. Veneering one side will cause the board to warp. I used mahogany crotch veneer at least 7″ wide by at least 12″ long. Crotch veneers tend to be thicker and stiffer than other veneers, so once the door was veneered, I clamped it between plywood boards.

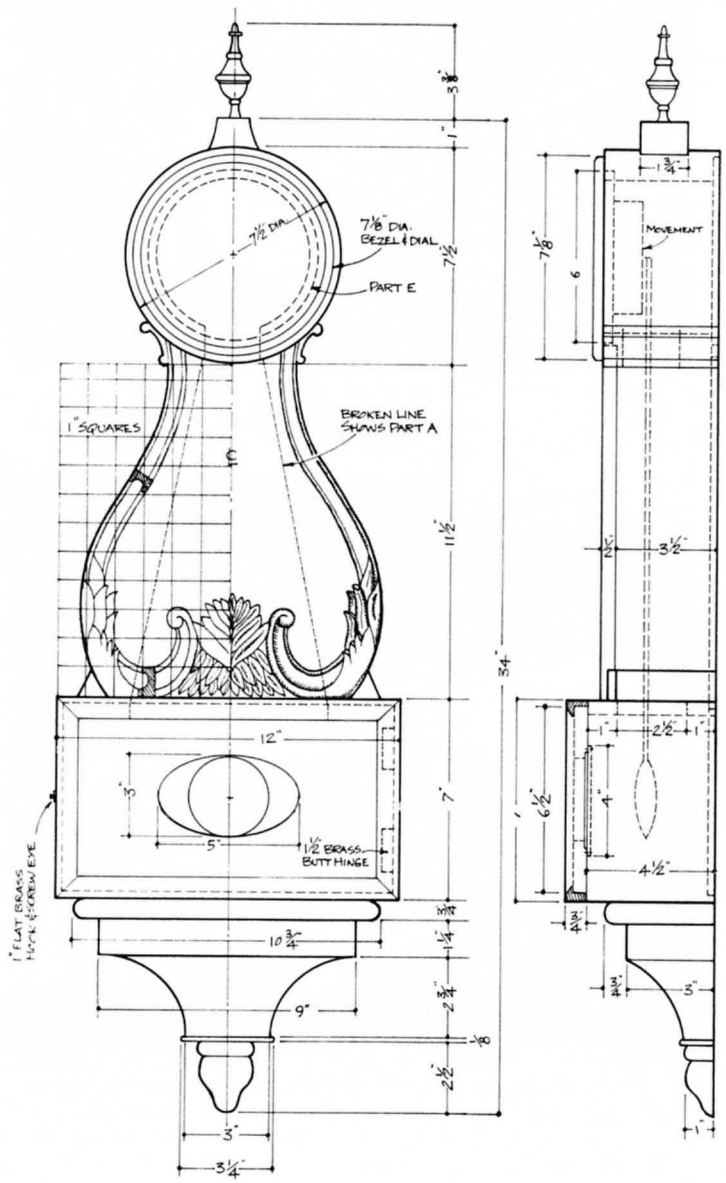
Cutting the ellipse in the door is next. A 1″ diameter sanding drum will effectively smooth the walls of the cut-out. A ⅜″ rabbet bit will make the ¼″ deep rabbet on the back for the glass and its retainer, part Q. I first tried plywood for the retainer but found it kept breaking. I finally settled on ⅛″ thick masonite that I veneered. Two brass escutcheon nails will hold it and the glass in the door.

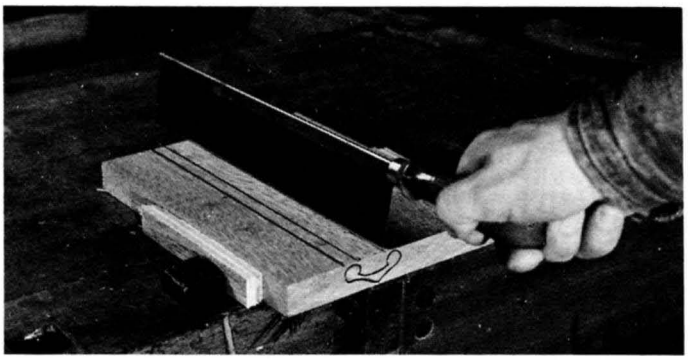
Before fitting the door with hinges, the molding, part P, will have to be made. This is much like a picture frame molding on a small scale. It should be made from a mahogany board ¾″ thick by at least 48″ long and several inches wide. I made the door slightly bigger than the dimensions shown so the door plus the molding would be bigger than the pendulum cabinet front. I was then able to run the door and molding over a jointer until it fit perfectly. The four-foot long board has to be stood on one edge and passed over a table saw blade set at 25 degrees. It may take some trial passes to get the same profile I got, but the results will be worth it. I then clamped the board down flat and took out a groove ½″ deep with a ⅜″ rabbet bit. Instead of nailing the mitered molding to the veneered door, I glued and clamped the pieces to part K. The hinges that hold the door are 1½″ long and made of brass. The flat hook that holds the door to the cabinet is also brass.

Now comes what may be the most difficult task for you, the carving of part F. If carving is not within your realm, Craftsman Wood Service (see page 12 for address) offers embossed carvings that can be applied. I'd recommend H2528 and H2514. If you are willing to carve the front, the best advice I can give is use a router with a ⅜ inch carbide straight bit and remove as much of the background, ¼″ deep, as you can. I would also glue part F to a slightly larger piece of ¾ inch plywood, newspaper between, that can be clamped to a bench. The margins, about 1 inch wide, that run along the sides are slightly hollowed, and these can be made with a veiner. Much of the rest of the detail can be put in with a parting tool. To get as smooth a background as possible, I raised the grain with a paint remover and went over it with a well-sharpened cabinet scraper.

For the finial base, part R, I again used my 7½″ diameter sanding drum and held a long piece of 8/4 mahogany to it to get a concave underside. It would help, however, to bandsaw the outline first. Notice that the sides are slightly flared outward. This can be done on a bandsaw before crosscutting to separate part R from the longer piece. Once sanded smooth, this part was attached to the top of C with contact cement.

To make the molding, part S, as shown in photo below, clamp a ¾″ thick piece of mahogany to your workbench. The board should be a little over 8″ long and at least 2″ wide. Draw parallel lines 1¾″ apart along the length of the board. On both ends within these lines draw the molding profile. Next draw parallel lines ⅜ inches in from the first lines to represent the beads. Along these lines I took a dovetail saw and cut a kerf about ¼″ deep. Then taking a wide no. 5 gouge, I scooped out the cove. After sanding the cove smooth, I ripped the outer edges of the molding profile at a 45 degree angle. This I clamped in a wood vise, shaping the back with the same no. 5 gouge. A sanding disc helped round the beads. 1-inch wire brads will hold the molding to the clock sides.



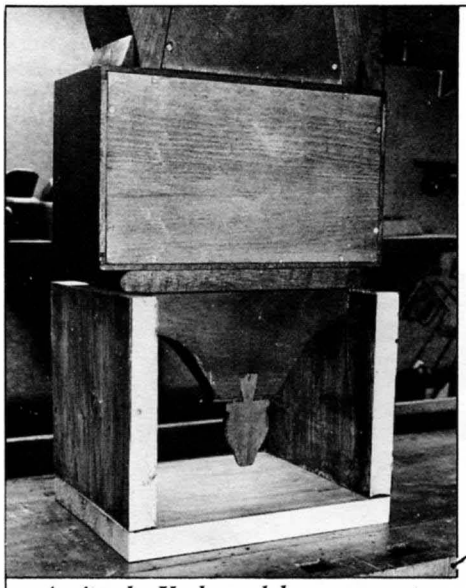


The last pieces to be fitted are the wedges, parts T. These can be ripped from a 5/4 or 8/4 board of any wood since they will be veneered with the same striped mahogany used for the rest of the clock. The flares at the bottom of part G may have to be filed a bit so they flow flush with the wedges. Contact cement will hold these pieces to the top of the pendulum case.

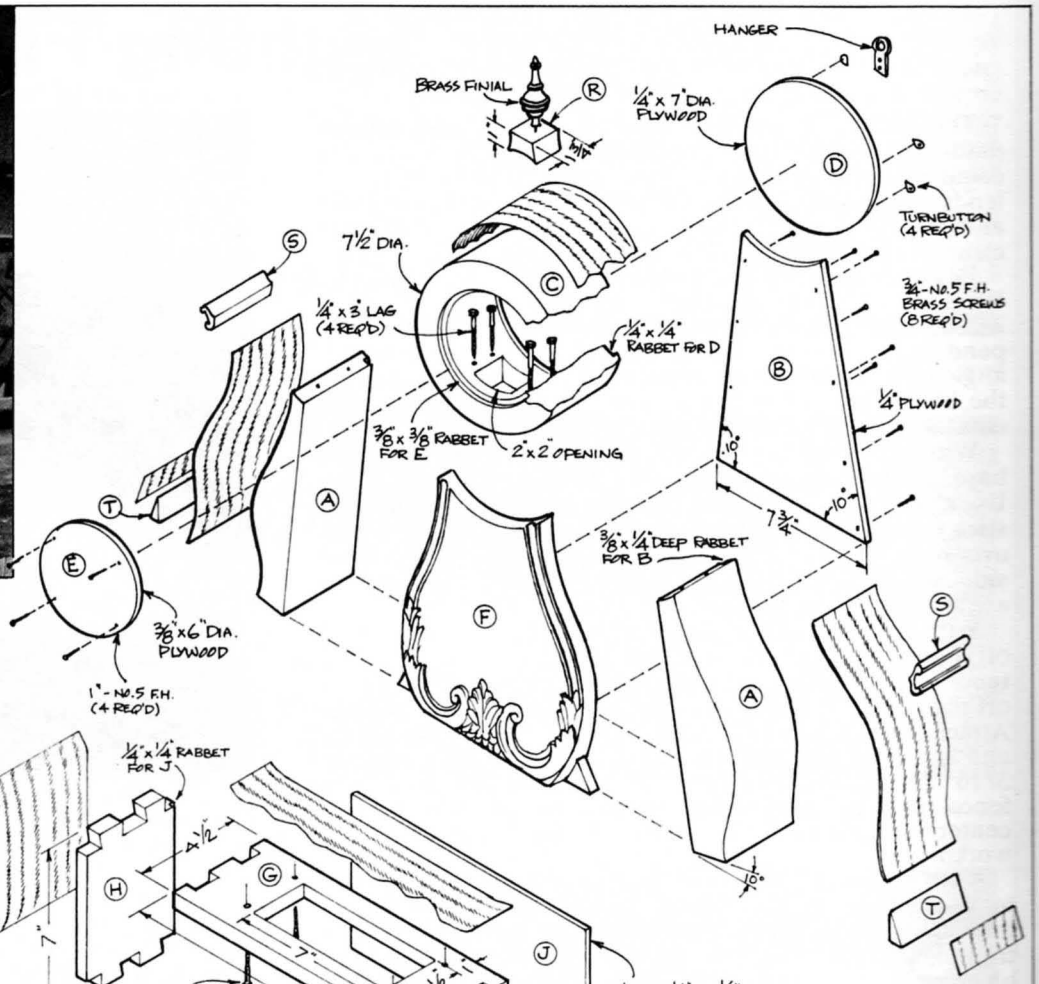
To finish the case, I used a mahogany paste filler mixed with a dark walnut stain. Where contact cement had gotten on the veneer, I was able to remove it with a paint thinner and steel wool. Over the stain I applied several coats of satin polyurethane.

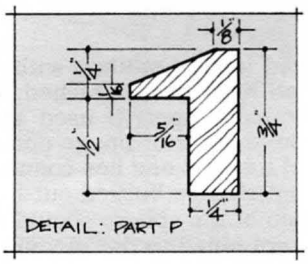
As if this project wasn't challenging enough, I made the clock case before I purchased the pendulum movement, one I had never used before. Happily, I found everything fit according to plan.

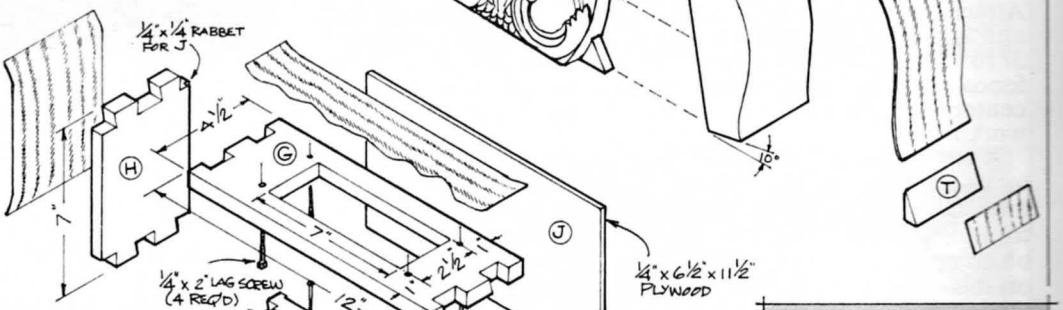
Mason & Sullivan Co., 39 Blossom Ave., Osterville, MA 02655, has a good selection of clock movements and hardware. I purchased an eight-day spring-driven movement, No. 3340X, the bezel and dial combination, No. 3403X, and the brass urn finial, No. 3901B, for about $70. Even if you have to purchase some lumber for your clock, I'm sure this heirloom piece can be built for less than 100 dollars.

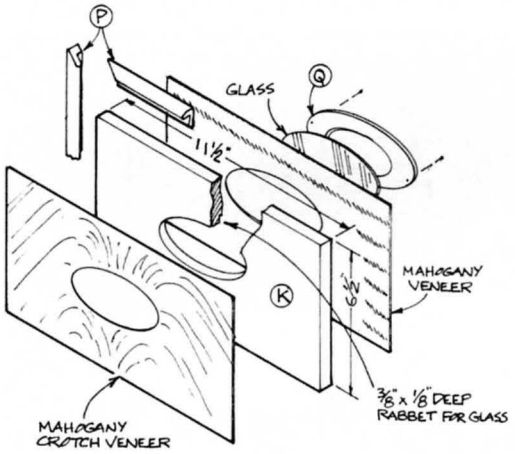


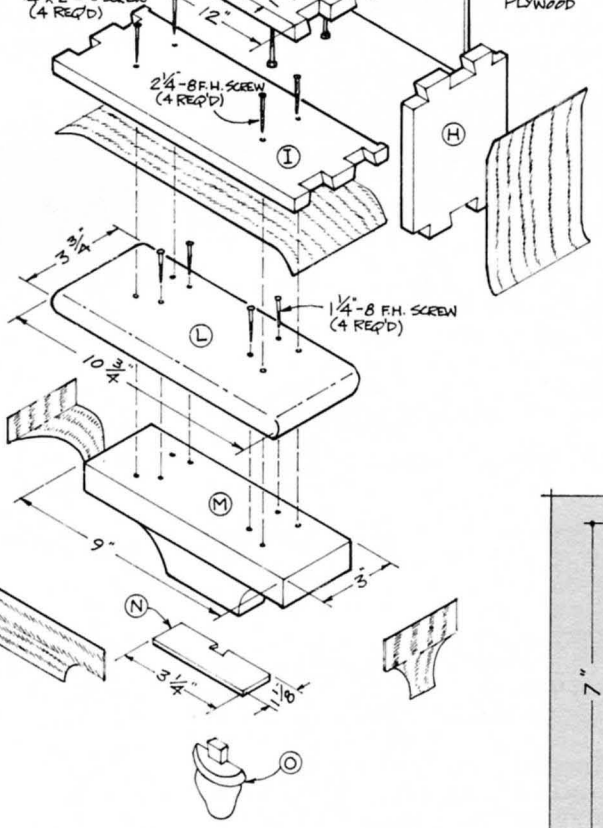
A simple U-shaped box supports the case while work continues.

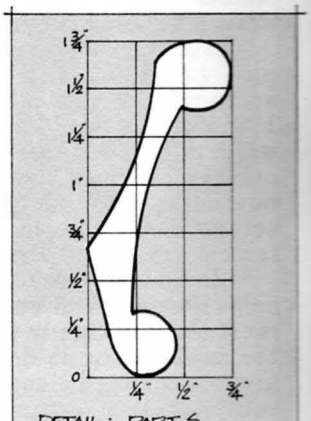


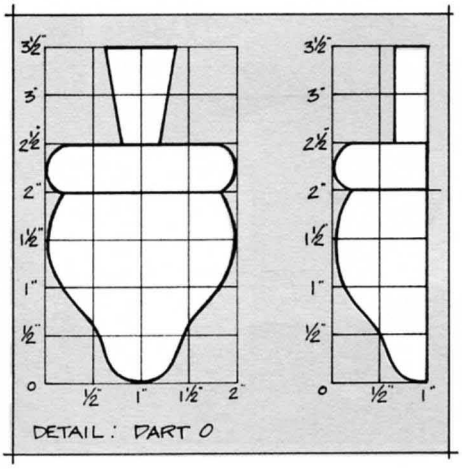


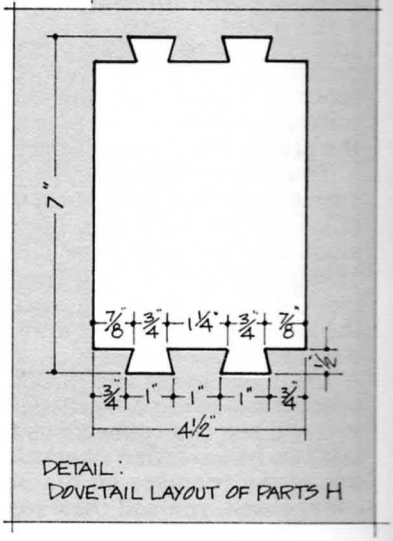




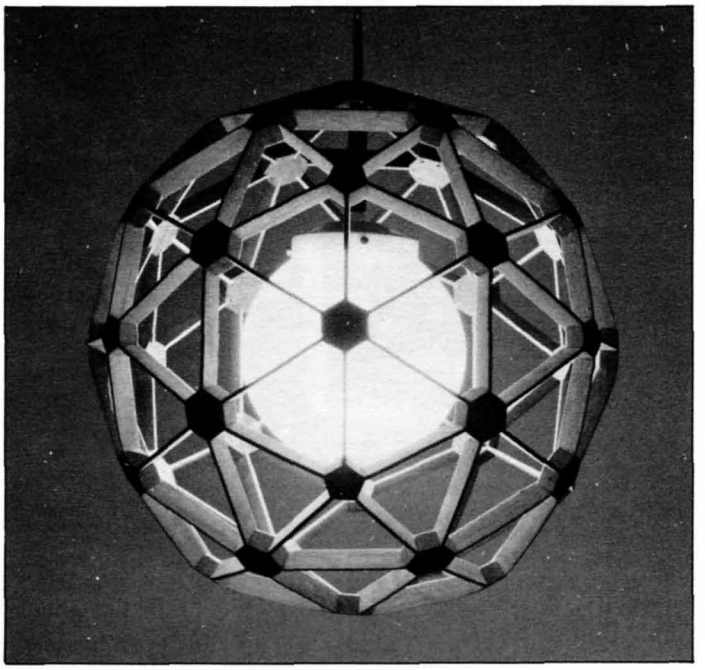








Geodesic Lighting Fixture



This intricate network of connectors and chords is fascinating to look at and equally fascinating to build. The completed sphere is quite rigid, yet light in weight, and lends itself admirably to a hanging fixture, with or without an enclosed lamp. We made ours of mahogany, but most clear cabinet woods can be used including pine.

Begin by making the hexagonal connectors (part A). Using glued up or solid stock, cut a workpiece of 1½" x 2" x 32". Set your tablesaw blade at 30 degrees. Don't depend on the machine tilt scale but instead use a drafting triangle or a carefully cut cardboard or plywood gauge to set the blade. Use a flat (not hollow-ground) saw blade that cuts a kerf close to ⅛" in width.

With a 2" wide side of the stock riding on the table as a base, cut both corners off leaving at least ⅞" at the base. Use a push stick to feed the workpiece and another notched stick to hold it down and against the fence. Flip the stock over onto the other 2" side and repeat. Trim both left-hand side cuts (or right side cuts) until all sides of the hexagon are an equal ⅞" in width.

With the blade still set at 30 degrees, rip a beveled strip off a straight piece of scrap and tack this to an auxiliary fence as shown. Use the regular fence to rip a slight bevel off the corner of the strip as shown in the sectional views. Attach the auxiliary fence to the regular fence with screws and lower the saw blade (still set at 30 degrees), to cut a 3/16" deep groove along each corner of the hex stock. The fence must be carefully set so that the grooves will be centered exactly on the hex corners for the full length of the workpiece.

After grooving, set the blade at 0 degrees and use the miter gauge to crosscut the hex stock, like a loaf of bread, into 30 pieces, each ¾" thick. When crosscutting, do not trap the pieces between the fence and the blade. Set a stop block against the fence, well ahead of the blade and ride off this. After cutting 30 pieces, you should have about 6" of waste left. Less than this would be unsafe to hold.

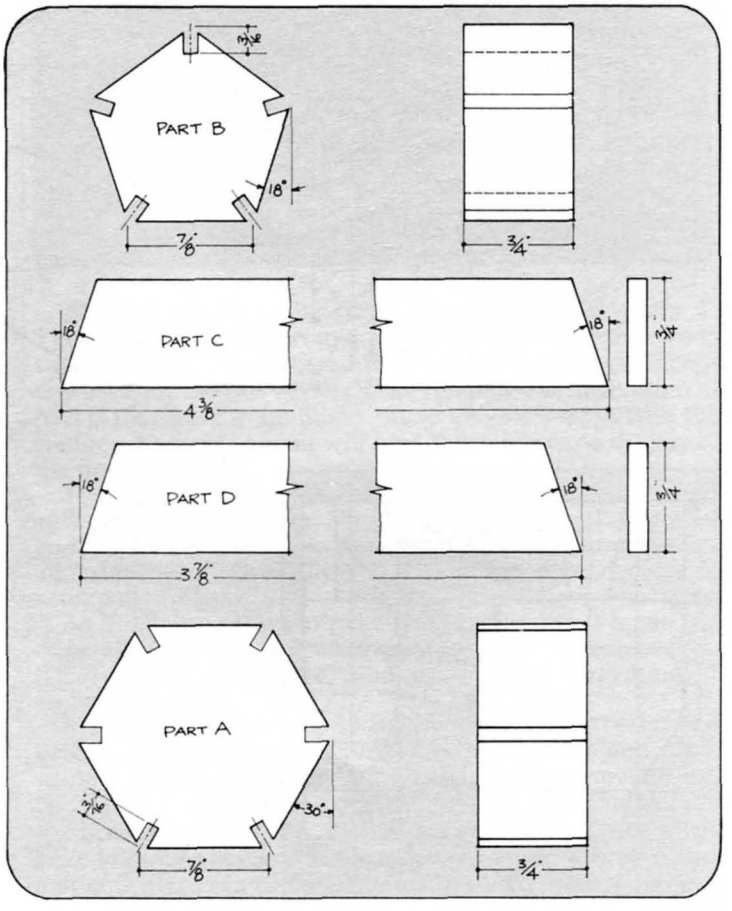
The pentagonal connectors (part B) are next. Cut a workpiece to 1½" x 1⅝" x 18". Again, use a prepared gauge to accurately set your tablesaw blade to 18 degrees. With a 1⅝" side as a base, cut off two base corners leaving a base width of ⅞". Tilt the workpiece counter-clockwise so that one newly formed side is a base. Adjust the fence for the next cut to make the base ⅞" wide. Using the same fence setting, rotate the piece counter-clockwise and make your last cut to form the pentagon.

Pull the 30 degree beveled strip off the auxiliary fence and replace it with one beveled at 18 degrees. This strip must also be slightly trimmed to clear the sawblade. Tilt the sawblade to 36 degrees (this is not critical) and run grooves centered along the five corners of the stock, then set the blade at 0 degrees and crosscut 12 slices, each ¾" thick.

From ¾" stock, rip strips just thick enough to fit snugly in the grooves after sanding. You will need 60 pieces cut to a full length of 4⅜", mitered at each end at 18 degrees (part C), and 60 pieces cut to a full length of 3⅞", also with ends mitered at 18 degrees (part D). Use a stop block on the fence to prevent binding the pieces when the ends are mitered and make test cuts with scrap to set the fence for the proper length of each part.

To assemble the sphere, mark a 16¼" dia. circle on a flat surface and with the hex connectors (A) and 10 long chords (C), form a circle on top of this template (photo 2). Only a small dot of glue such as TiteBond is needed in the slots. When the circle is complete, take one hex connector and two C chords and form a triangle using two of the hexes on the base circle. Continue until five triangles are built off the base (photo 3).

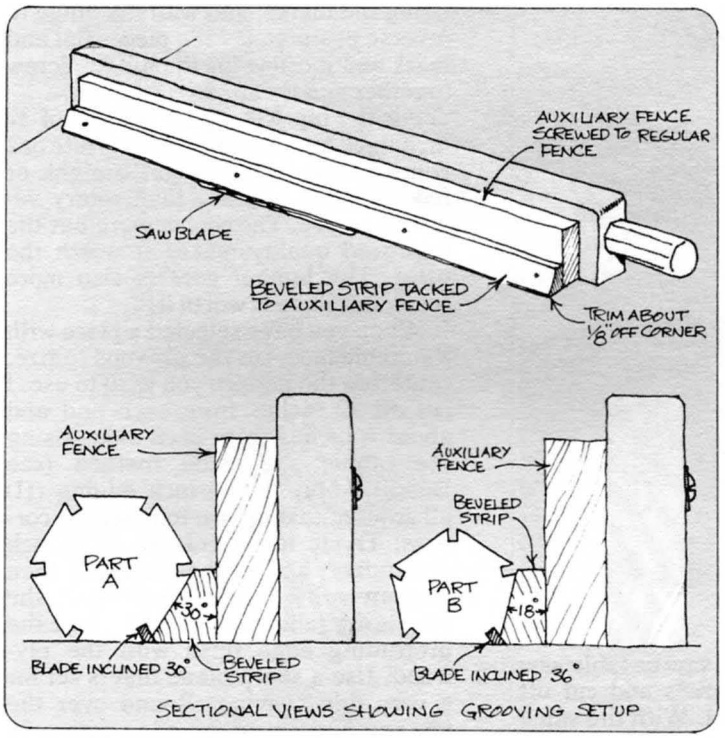
Using two hexes and three long chords, form an arc and connect two of the base triangles with this arc. Once added, you will see two connections to be completed between the last two hexes added (marked A in photo 4) and the top of one of the triangles on the base circle. Making these two connections, you will then see voids in the sphere that are pentagonal. These will be filled later. Continue with your long chords and hexes until all have been attached, then turn the dome over on a suitable support (I used an old towel in a doughnut shape). Build a mirror image dome on this side of the base circle, but rotate it one hex connector. In order to insert the globe and change burned-out bulbs, one hex connector at the bottom of the sphere should have its five chords glued to it but not glued to the surrounding connectors. To pull the joints together, use a tourniquet

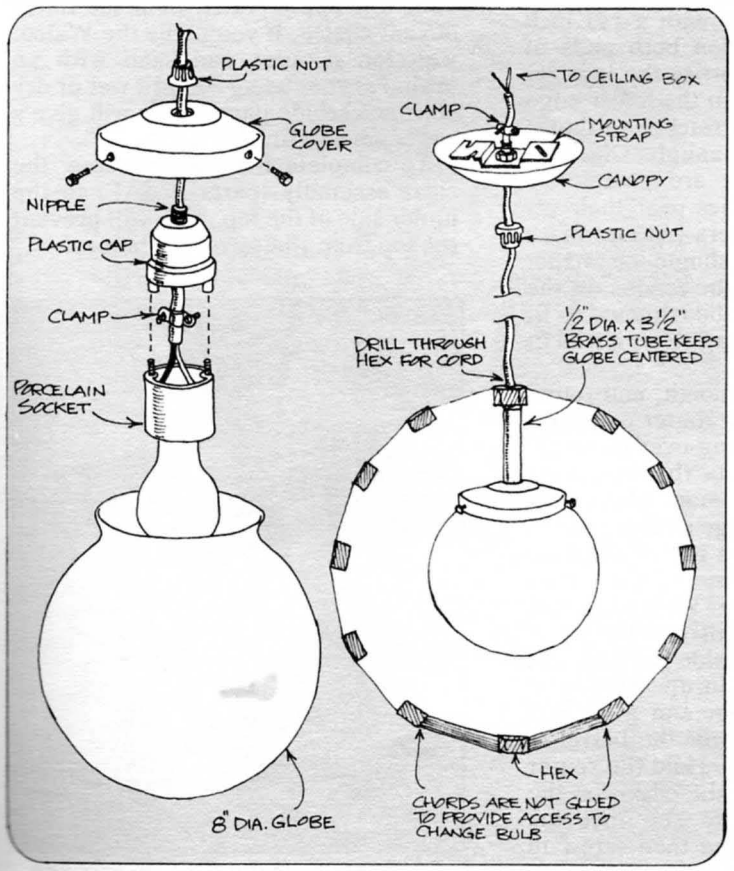


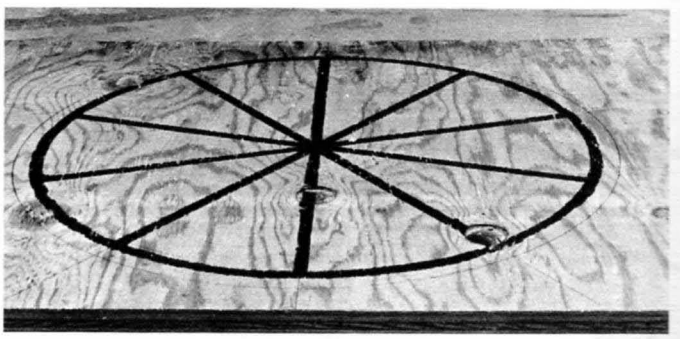
technique with a length of string and a pencil. When all joints are dry, sand or chisel the tips of the chords flush with the tops of the connectors.

We used a white 8″ dia. globe and ceiling canopy. This unit is model SL-8440 by Thomas Industries and was purchased at a local electrical supply store. The fixture included a white line cord and all neccesary hardware except the ½″ dia. x 3½″ tube which acts as a spacer between the globe and the underside of the top hex.

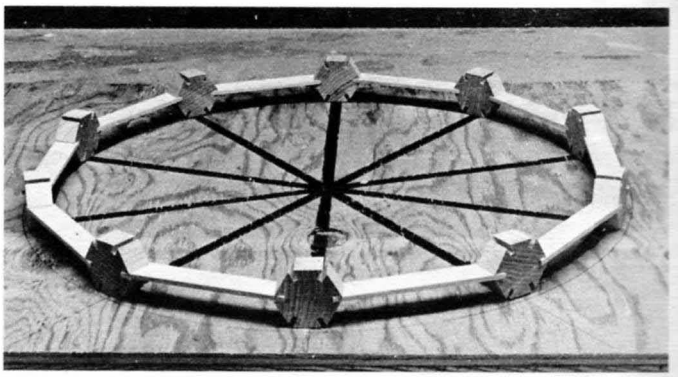
If desired, the sphere can be finished with a coat of penetrating oil such as Watco, applied to all surfaces with a small brush.



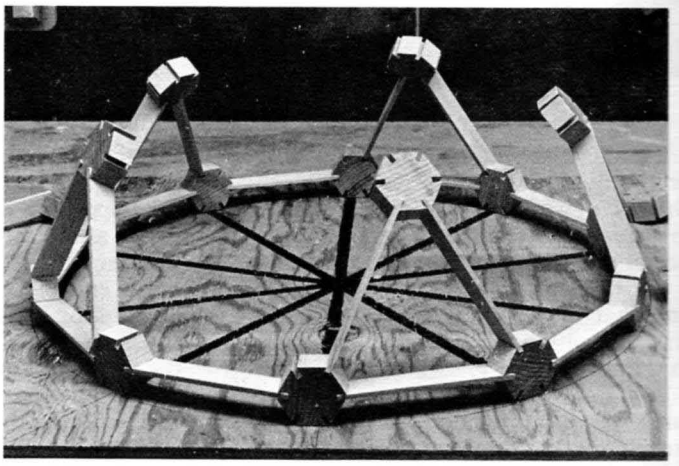




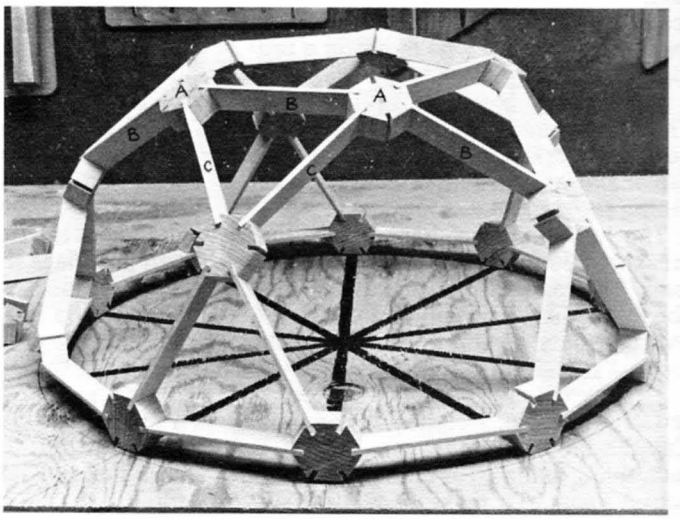
Draw a circle with a diameter of 16¼″ on plywood and divide it into 10 equal segments.



Using the circle as a template, join 10 hex connectors (A) and long chords (C) as shown.



With one hex and two long chords, form triangles off the hexes on the base.



Connect two base triangles by spanning them with two hexes and three long chords. These are marked A and B in the above photo. Then add two chords marked C.

Sawhorse Table by Paul Levine

The sawhorses shown here were originally built to be used in my workshop. Knowing how difficult it can be to transport a pair of sawhorses, especially if they must be squeezed into a car, I wanted them to be portable, and that meant they had to fold flat. And of course, it was also important that they be sturdy.

I was so pleased with the appearance of the finished pair, the idea struck me that the sawhorses could be teamed up with a nicely finished oak top to make a very handsome dining room table - one that offered the added feature of being portable. Apartment dwellers and those who move on a regular basis will appreciate that.

So readers have an option here. They can make just a good solid pair of portable workshop sawhorses or they can make an attractive contemporary dining room table.

The table shown has a top that measures 36 inches wide by 72 inches long, but readers can make it to just about any size, larger or smaller. A pair of cleats on the underside of the top will keep it from sliding.

To make the horses, get out stock of red or white oak number 2, common. Cut the stock five inches wide by ¾ inch thick, using clear cuts or cuts with sound knots. To make a pair of sawhorses, you will need 4 pieces 30 inch (part A), 8 pieces 25 inch (part B), 4 pieces 22 inch (part C), and 4 pieces 4 inch (part D).

Set your radial arm saw or table saw miter gauge to 5 degrees and cut off the legs (B) at one end. With the same miter angle but a lower blade setting (higher on the radial saw) tenon the other end of the legs with a 1½ inch long tenon. Also tenon both ends of the stretcher (C). Mortise the legs for the stretcher, and trim the lower edge of the tenon on the stretcher so that it will enter the mortise snugly. Glue up.

When these parts are completely dry, lay the assemblies over their respective base members (A) and mark where the mortises should be made. The inside edges of the tenons on the legs will also have to be trimmed to fit the mortises in the tops. After a trial fit glue up the frames.

When dry, sand smooth, and round over the edges with a router equipped with a ¼ inch rounding-over bit. Centering the hinges above the legs along the top of the frames, mark where they will go. Place the hinge so that the top edge is flush with the top of the base (A). Scribe the outline of the hinge with a knife or ice pick. With a straight bit in the router, mortise for the hinge plates, staying just inside the line. Use a sharp chisel to clean up the edges. Next, using the router and a ½ inch core box bit, mortise for the barrel of the hinge (see Detail). Hold the router base against a straight edge, or the edge guide. Check to see that the hinge fits properly and then screw in place.

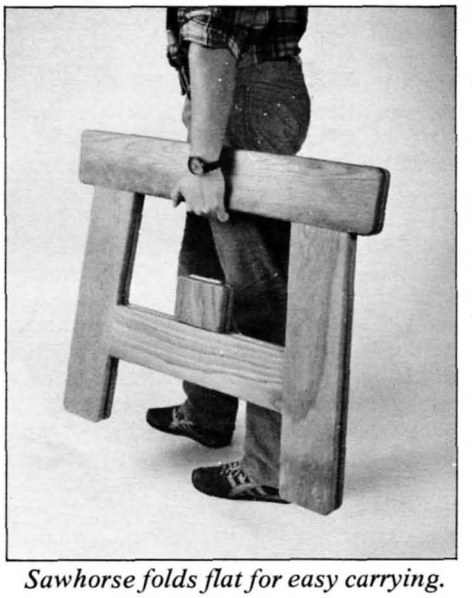
Place the two spreaders (D) together and hinge in the same fashion (see Detail). This time the barrel will protrude above the edge.

Next hinge the spreaders to one of the frame stretchers. The hinge is mounted in reverse so that the countersinks will be towards the stock (see Detail). Lay out flat and mark for the hinges. Mortise and assemble. Place the horse in open position and mark where the spreader falls out on the opposing stretcher, then disassemble. Using the marks, and with the hinge in reverse position, lay the pieces flat and mark and mortise for the hinge. Screw together and finish.

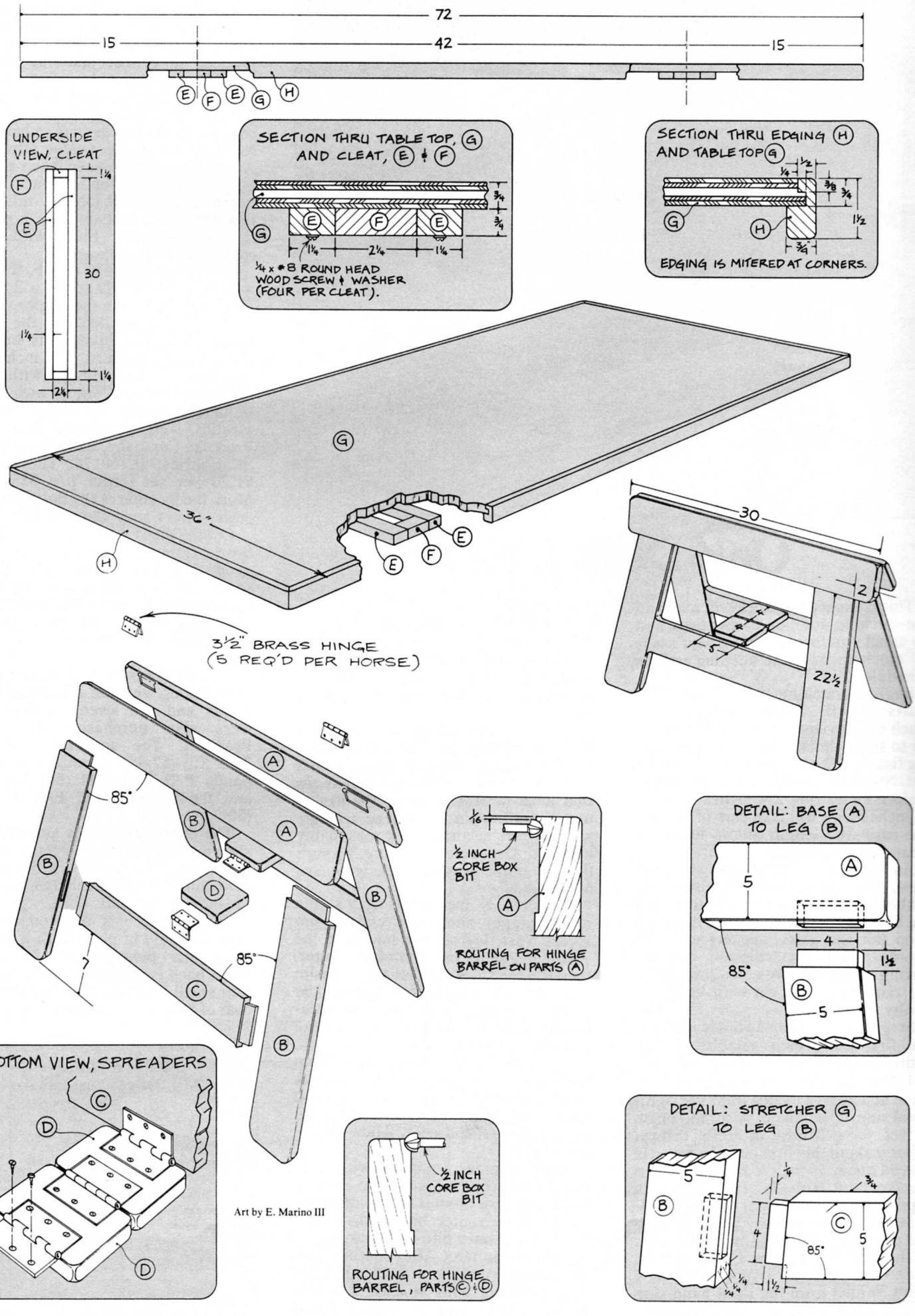
For the top (G), select a piece of ¾ inch thick lumber-core red or white oak veneer plywood. Try to get straight, or flat cut veneer rather than rotary veneer plywood. The cost is more but the improved quality makes it worth the price. The lumber core is also more costly but it too is worth it.

When you have selected a piece with a suitable face, cut the plywood to size, centering the pattern you wish to use. I cut off 12 inches from each end and about 6 inches from each side. Using the rabbet and dado method (see Detail), apply the ½ inch edging (H) all around, taking care to miter the corners. Try to leave 1/16 to 1/32 inch protruding above the surface, then glue up with Titebond glue. When the glue is dry (allow overnight), plane the protruding edge flush with the plywood. Use a sharp plane that is set for a very thin shaving. Round over the top and botttom of the edge with a ⅜ inch rounding-over bit in the router. Sand and apply Watco oil or the finish of your choice. If you apply the Watco, wait ten minutes and sand with an orbital sander using 500 grit wet or dry silicone carbide paper. This will give a super smooth finish.

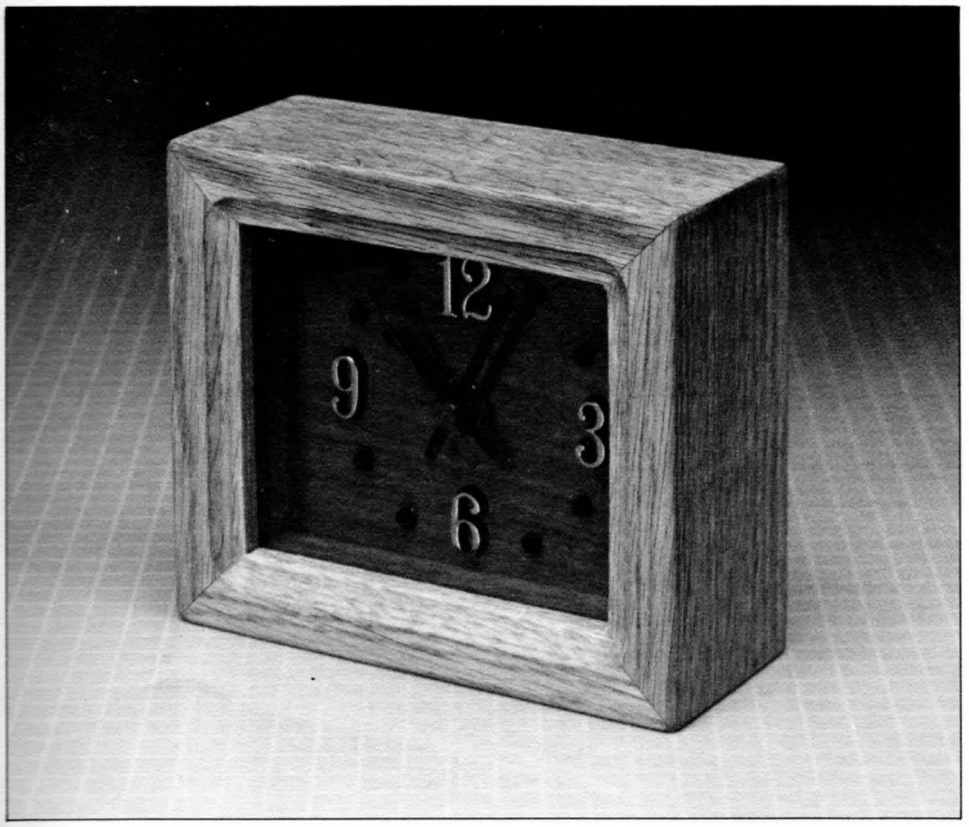
To complete the project screw the cleat assembly (parts E & F) to the under side of the top. This will prevent the top from sliding off the horses.



Sawhorse folds flat for easy carrying.



Art by E. Marino III



Oak Desk Clock

This compact oak clock will make an eye-catching addition to any desk and its small size insures that it won't take up much space while keeping you on schedule.

Begin by making the mitered case (parts A & B). As the case provides much of the visual appeal of the clock, try to select stock that has an interesting figure. It's also important that it be flat. Not much stock is required, in fact a piece measuring 2¼ inches wide by 23 inches long will take care of the entire case (the length allows for some scrap when cutting).

As shown in the cross-sectional view, the case stock requires two rabbets, one that's ¼ inch deep (for the back) and another that's 1⅞ inches deep (for the glass, spacers and dial board). Using the tablesaw, and referring to the drawings, you'll find that the rabbets can be cut with little difficulty.

Step 1 shows the sawblade making the first cut which establishes the width and depth of the rabbet for back (D). Note that the tablesaw rip fence is fixed at a point 2 inches from the right-hand side of the blade. Also, the blade is set to a height of 9/16 inches. After making this first cut, the fence is moved about ⅛ inch to the right, then a second cut is made. The process is repeated until the rabbet is completed.

Step 2 shows the sawblade making the cut which establishes the location of the rabbet for parts C,D,E and F. Note that the fence is now fixed at a point ⅜ inch from the right-hand side of the blade and the blade height is now ¼ inch.

Step 3 shows the final cut. The fence is fixed at a point ¼ inch from the *left-hand* side of the blade with it's height set at 1 13/16 inches. The stock is passed over the blade on edge as shown.

To make the miters, set the sawblade to 45 degrees. For a good miter joint, the angle must be exact so it's best not to rely on the crude gauges that most tablesaws have. We like to use a draftman's 45 degree triangle which offers accuracy at a reasonably low cost. Also, before starting, be sure that the miter gauge is exactly square to the blade.

With the ¾ inch edge against the miter gauge, miter one end of the stock. Next, lay out the length of the piece, mark the location of the miter, then flip the stock over (so the opposite edge is against the fence), and cut the piece to length. Make all cuts accurately. Repeat this process until all four case sides are mitered.

Apply glue to the miters, then clamp securely with a strap clamp. The oak really soaks up the glue so it's a good idea to apply one coat, let it soak in, then add a second coat. Allow to dry overnight.

Next, a router equipped with a ⅜ inch piloted cove bit is used to cut a ⅛ inch deep cove around the inside of the front. Some router bit pilots have a tendency to burn into the stock, so use a light touch here. After routing, give all outside surfaces a thorough sanding, finishing with at least 220 grit. Lightly round over the edges. Finish with Deft Danish Oil.

The dial board (F) is made from a piece of ¼ inch plywood with veneer added to both sides. It's not a good practice to veneer just one side as uneven stresses could cause the plywood to warp at some point in the future. We chose walnut although rosewood, ebony or any other dark wood veneer would also be attractive. A less expensive veneer, such as poplar, can be used for the back of the board. For a small job like this, contact cement is probably the best way to apply the veneer. Finish with a light coat of oil.

Locate the center of part F, then use a compass to lightly scribe a 2⅞ inch diameter circle. At the center, drill a ⅜ inch diameter hole for the movement shaft. The black dots between numerals are made from ⅛ inch dowel rod cut to ⅛ inch lengths with a fine tooth dovetail saw. The ⅝ inch Arabic numerals (made of brass finished plastic), were purchased from Craft Products Company, 2200 Dean Street, St. Charles, IL 60174. The price is $1.20 per set (order p/n 3251-C81). Mark the location of the dots and numerals, then epoxy them to the board.

Cut the glass (C) to size. We chose a bronze tinted glass but clear also looks good. It's held in the case by the spacer strips (parts D & E) which are secured with a spot of glue at each center. This makes for easy removal should the glass ever need to be replaced.

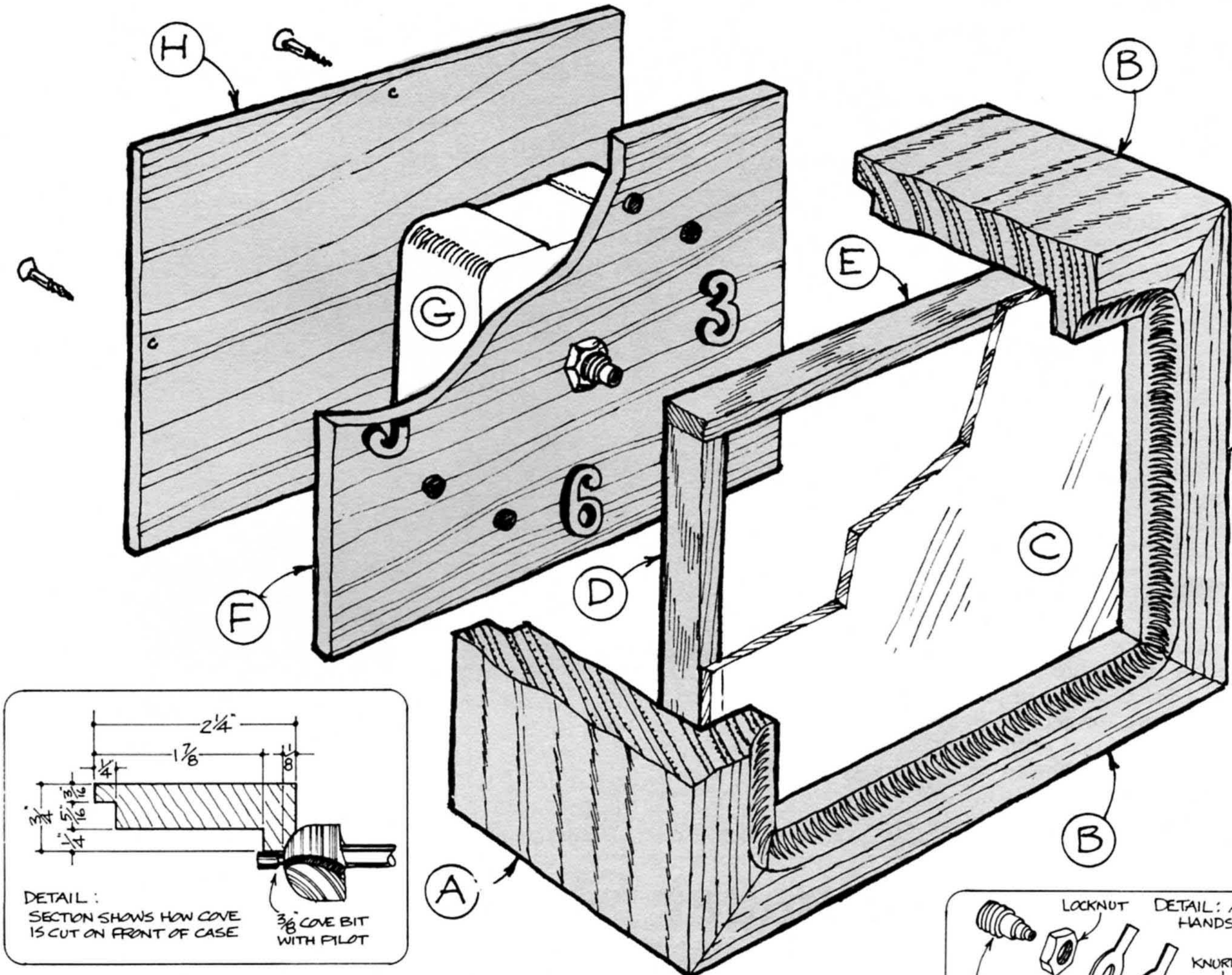
The quartz battery powered movement, along with the minute and hour hands and the sweep second hand were also purchased from Craft Products. The movement is P/N 2325-X01 ($7.95), the minute and hour hands P/N 2450-K44 (60¢ per pair) and the second hand P/N 2459-544 (50¢).

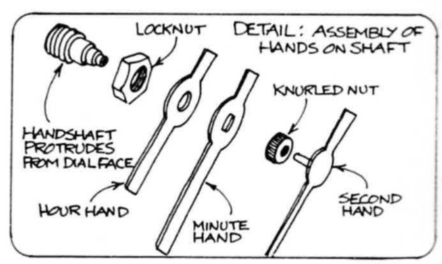
The movement (G) is assembled as shown, with the brass locknut holding it in place. The hands are trimmed to fit within the dial face, then added to the movement shaft.

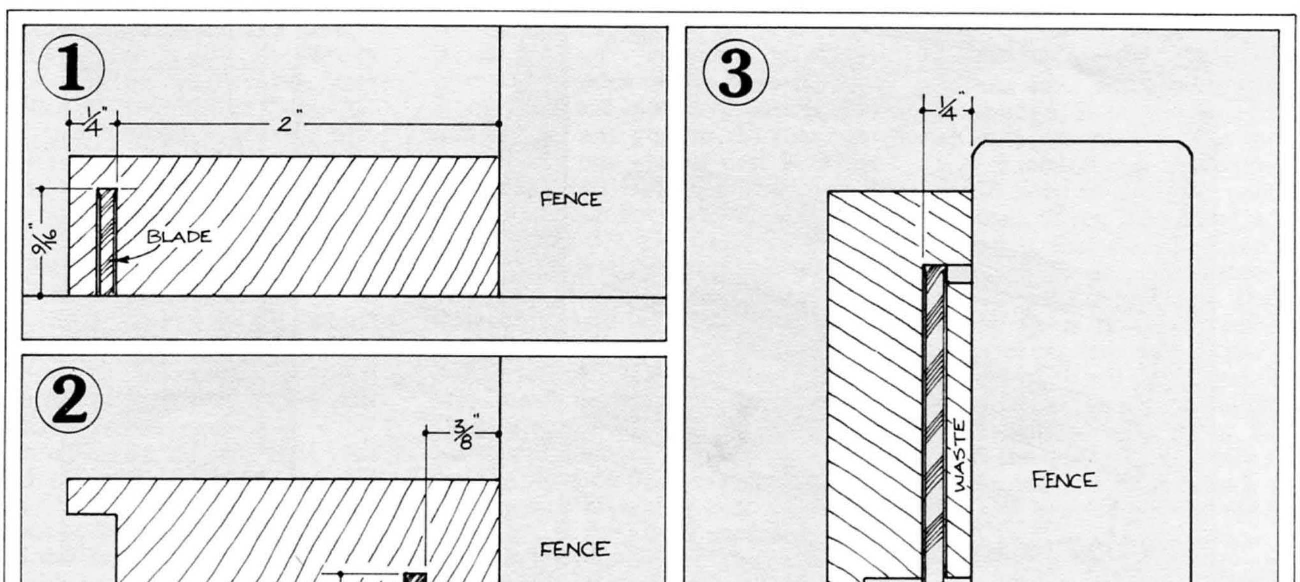
The dial face is inserted into the case and held in place with a glaziers (triangular) point at each side. A plywood back is secured to the case with four small brass screws. Another light coat of Deft Oil completes the project.

Bill of Materials
(All Dimensions Actual)

Part	Description	Size	No. Req'd
A	Case Side	¾ x 2¼ x 4¾	2
B	Case Top & Bottom	¾ x 2¼ x 5½	2
C	Glass	⅛ x 4-7/16 x 3-11/16	1
D	Side Spacer	3/16 x ½ x 3⅜	2
E	Top and Bottom Spacer	3/16 x ½ x 4½	2
F	Dial Board	¼ x 4-7/16 x 3-11/16	1
G	Movement	Craft p/n 2325-X01	1
H	Back	¼ x 5-1/16 x 4-5/16	1


H
G
3
6
F
E
D
C
B
A
B
A
2¼"
1⅞"
¼
⅛
¾"
5/16
3/16
¼"
DETAIL:
SECTION SHOWS HOW COVE
IS CUT ON FRONT OF CASE
⅜" COVE BIT
WITH PILOT


LOCKNUT
DETAIL: ASSEMBLY OF
HANDS ON SHAFT
KNURLED NUT
HANDSHAFT
PROTRUDES
FROM DIALFACE
HOUR HAND
MINUTE
HAND
SECOND
HAND


1
¼"
2"
9/16"
BLADE
FENCE
2
⅜"
¼"
FENCE
CLEANED OUT WITH REPEATED
PASSES OVER BLADE
3
¼"
WASTE
FENCE

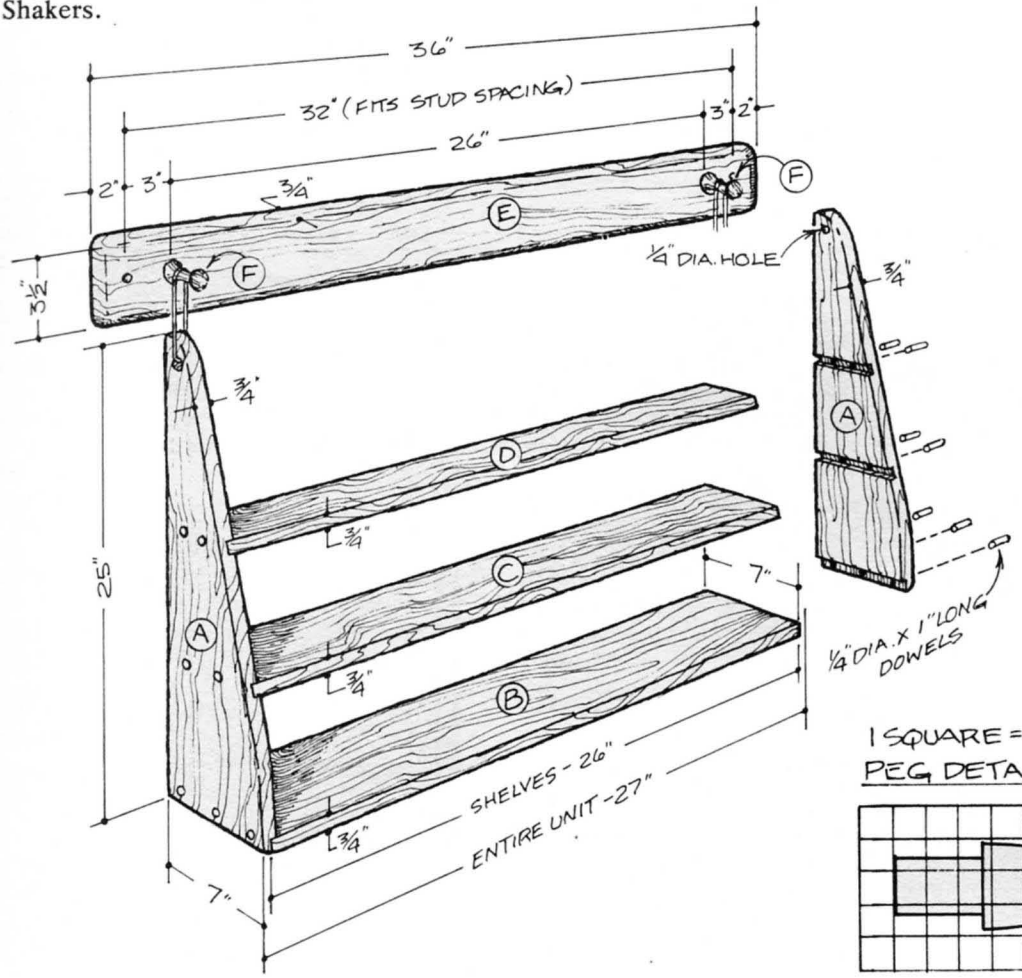
Shaker Shelves

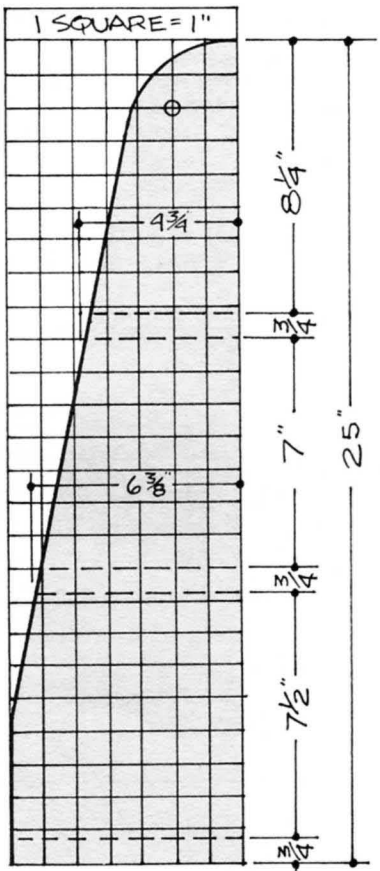
The dimensions of these lovely pine shelves are nearly identical to a Shaker original that hangs at the Hancock Shaker Village in Hancock, Massachusetts. The only significant difference is in the thickness of the stock - ours is ¾ inch while the Hancock piece was made from ⅝ inch lumber. The Shaker pegs (F) can be turned to the profile shown or purchased from Shaker Workshops, P.O. Box 1028, Concord, MA 01742.

Cut the two sides (A) from 1 x 8 nominal stock, then use an adjustable dado head cutter to make the ¼ inch deep by ¾ inch wide rabbet for part B. The ¼ inch deep by ¾ inch wide dadoes for parts C and D can be cut at the same time. Next, lay out the curved profile (see grid pattern), before cutting with a band or saber saw.

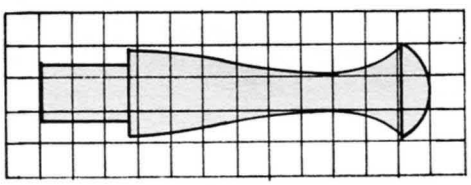
After cutting shelves B, C, and D, and pegboard E to dimensions shown, give all parts a thorough sanding. Assemble with glue and clamp securely. When dry, remove clamps, then add the ¼ inch diameter by one inch long dowel pins as shown. Use a sharp plane to bevel the front edge of the two upper shelves. Glue pegs (F) in place, then give the entire project a final sanding. Ours was stained with Minwax's Fruitwood stain, followed by a final finish of Minwax's Antique Oil.

Two counterbored holes permit the pegboard to be secured to the wall. A pair of leather laces, tied in a loop, allows the shelf to be hung from the two pegs - a common practice of the Shakers.





1 SQUARE = ¼"
PEG DETAIL



Old-Time Radio Case

by Sam Allen

If you're a nostalgia buff, radio from the 30's and 40's holds a special place in your heart. Here's a project to help you relive that golden age of radio.

This reproduction of a cathedral radio case can serve many purposes. I originally intended it for use as a speaker enclosure. You can mount a speaker inside and then plug it into the earphone jack of a portable radio or tape player. A lot of today's small portables are equipped with tiny 2″ to 3″ speakers that can't handle all the sound the amplifier is capable of producing. You'll be amazed how good a small portable can sound when connected to a 6″ to 8″ extension speaker.

If you're really into nostalgia, you probably have tapes of old radio programs. Now you can really get the feel of sitting around watching the radio by playing your tapes through a speaker mounted in this old-time case.

By building two cases you can use them as extension speakers for your stereo. You can also mount a modern radio inside the case. There is ample room for most transistorized units with room left over for the addition of an oversized speaker. Even if you don't have any electronics experience, you can use the case to camouflage a modern piece of equipment by simply leaving the back off the case and putting the equipment inside.

The empty case can even be used to add a touch of nostalgia to a room's decor. Add a door in the back panel and use the case as a hidden storage space. Add a lock to the door and a slot in the top and it's a giant piggy bank.

Except for parts C and F, the case is made of ¼″ 3-ply birch plywood. Start construction by making the front (A). Cut a slightly oversize piece of plywood and transfer the full size pattern to it. The pattern is symmetrical so only one half is shown.

Drill a small hole in the center of each of the outlined openings to allow a jig saw or coping saw blade to be inserted, then proceed to cut out all the openings. Smooth the edges with a rat-tail file and sandpaper wrapped around a dowel. Use part A as a pattern to make the back (part D).

The base (C) can be made of ½ inch or ¾ inch plywood or solid stock. Cut it to 9½ inches wide by 7½ inches long.

Now cut a piece of ¼″ birch plywood to make the arched side (part B) and the two reinforcements (part E). The width of this piece should be cut about 1½″ more than the finished width of the case (see Detail A). The grain should run lengthwise. Make saw cuts one-half way through the plywood, across the grain, every ⅜ inch as shown in Detail A. After the kerfs have been made, rip two ½ inch wide strips to get parts E, then trim part B to the case width of 8 inches. Cut a ¼ inch wide x ⅛ inch deep rabbet on both of the long sides of part B to accept the front (A) and back (D).

Attach the front (A) to the base (C) with glue and two or three small brads. Also temporarily attach the back (D) with two small screws. Note that the front and back will extend beyond the base for ⅛ inch on each side. Apply glue to the sides of the base (C) and along the front rabbet of part B, but don't apply any glue to the rear rabbet. Secure one end of part B to the base with brads and then bend part B around the top curvature of the front (A) and back (D). The flexibility of plywood will vary depending on what type of core it has. A lauan core is very flexible and should be used if it is available. Plywood with a fir core will be harder to bend. If the plywood will not bend easily, it may be necessary to slightly dampen the kerfed side with water and preform the curve by working the plywood over a large diameter pipe before attaching it to the face. Pull part B tight and secure it with brads to the other side of the base. The dimensions given for part B include a small amount of overhang to compensate for any difference in the final dimensions of the front (A) and back (D) that might occur. Once part B is securely attached to the base, trim off the overhang.

Remove the back (D). The two strips (E) that were cut from part B are used as case reinforcements. Cut them to length so they will fit snugly inside the case. Glue the front reinforcement in place butted up against the inside of the front (A). The rear reinforcement should be positioned so its rear edge lines up with the edge of the rabbet.

Shape the two screw blocks (F) that the back attaches to so they will fit the contour of the arched top and glue them in place (see Detail B).

Now sand the case and round the front edge. What you do next depends on how you plan to use the case. If you're mounting some equipment in it, you'll need to drill the holes for the controls. If you'll be using it for an application that doesn't need controls, you'll need to make some dummy knobs (see Detail C). The dummy knobs are made of ½″ dowel. Fold a piece of rag into a small pad and place a piece of 80 grit sandpaper on top. Put the pad and sandpaper in the palm of your hand and cup your hand. Now push the end of a dowel into the center of the pad and twist it back and forth. It won't take long before the end of the dowel will be nicely rounded.

Switch to finer sandpaper to smooth the dowels, then cut ½″ off the end of the dowel to form the dummy knob. Repeat this procedure until you have made three knobs. Drill a blind pilot hole in the back of the knob for a #6

(continued on next page)

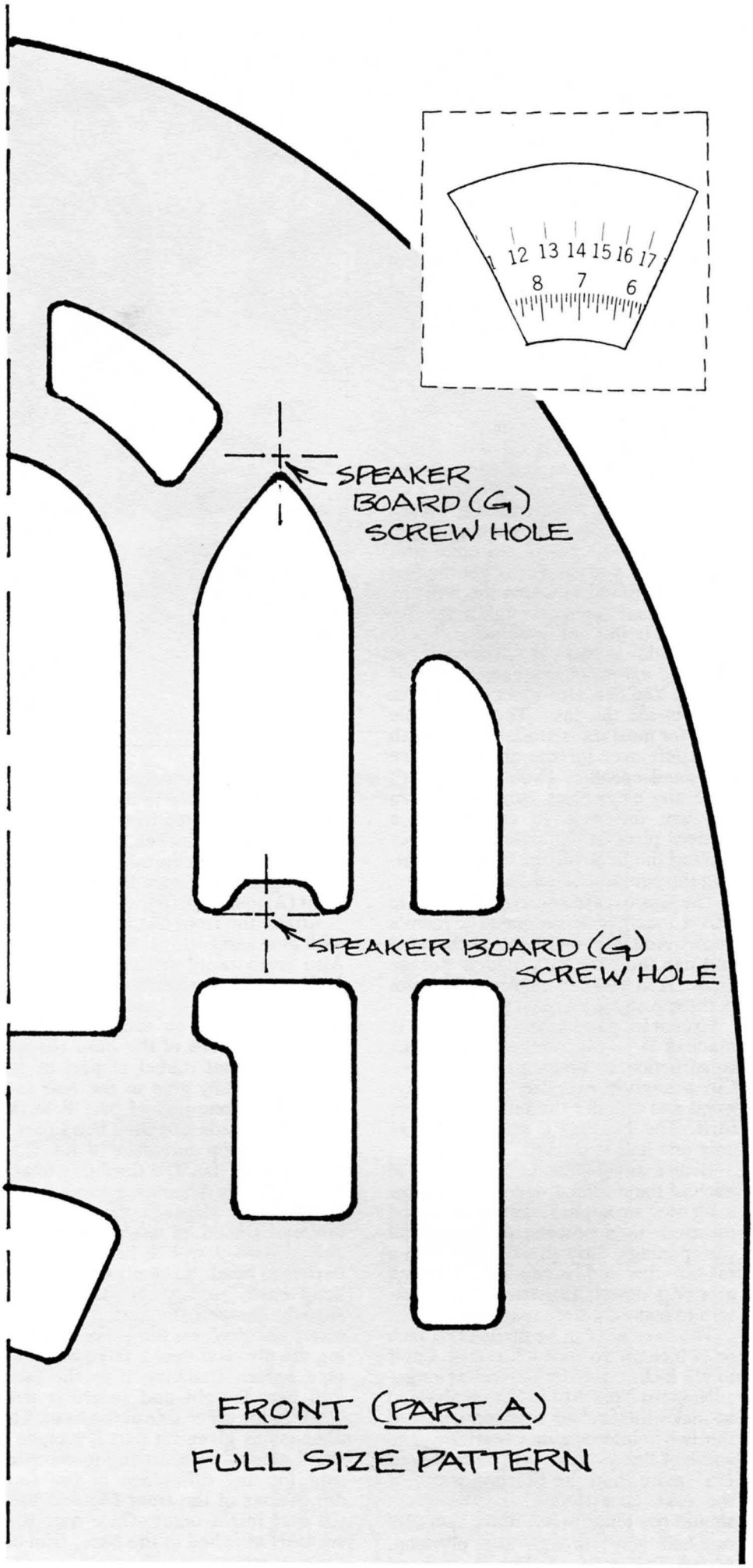
wood screw. Paint the knobs dark brown or black. Drill mounting holes for the knobs at the positions indicated on the plan.

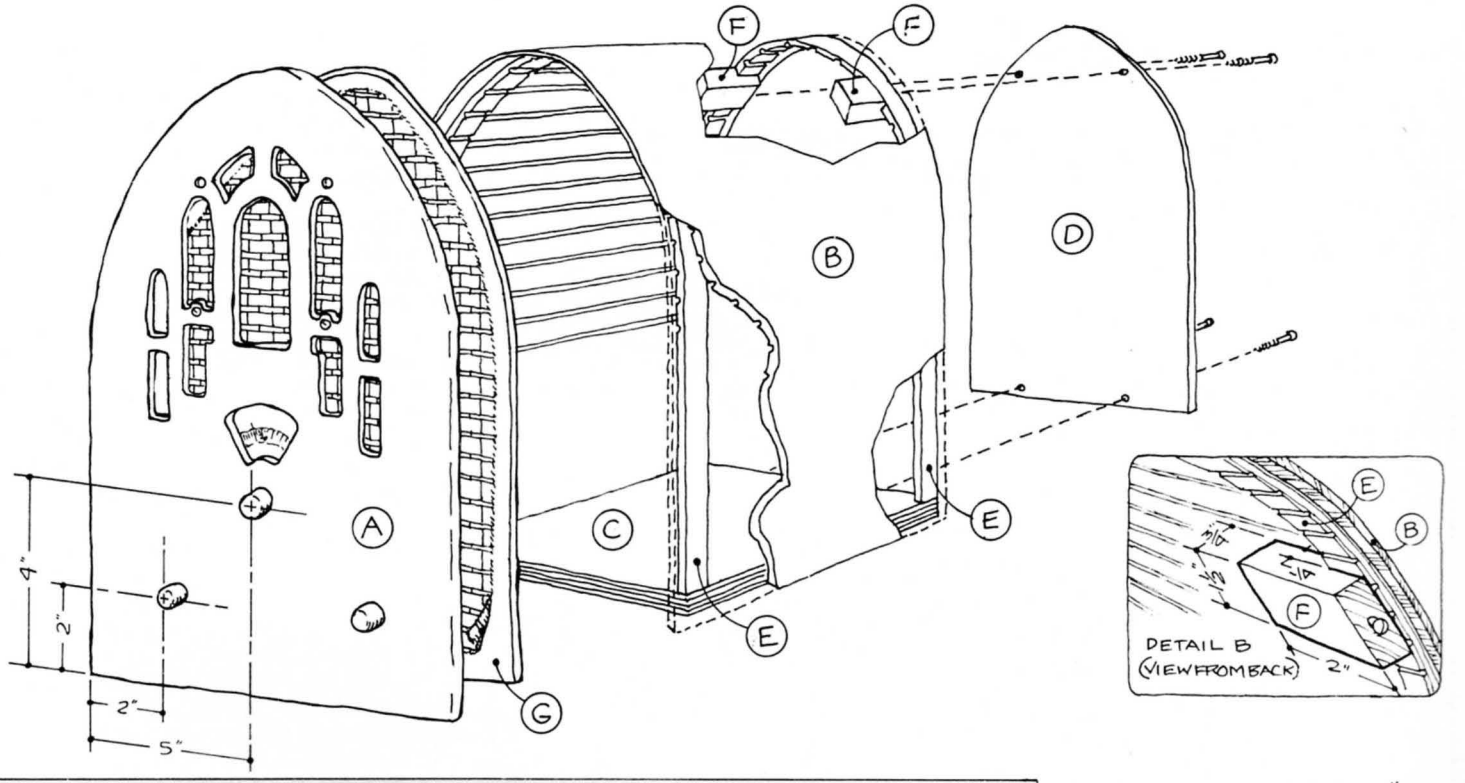
Another part that will vary depending on your use of the case is the speaker board (G). Make part G out of a piece of ¼" plywood. Cut the speaker board so it will fit inside the case butted against the inside of the front (A). If you're not installing a speaker, you don't need to cut any holes in part G. Just cover the front of part G with dark brown or black grill cloth from an electronics supply store. In the area of the speaker board that will be behind the station indicator window, cut away the grill cloth. Cut out the paper station indicator on the full-size pattern. (If you don't want to cut up your copy of *The Woodworker's Journal*, make a photocopy). Use rubber cement to glue the paper to the speaker board where it will show through the window. Cover the paper with a piece of clear contact paper to protect it. The speaker board is held in place with four #6 brass flat head wood screws as indicated on the full-size pattern.

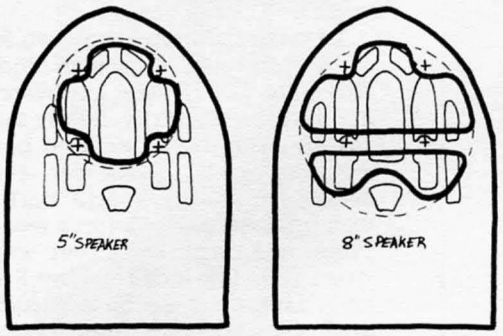
To install a speaker, hold it in place on the board and trace around it. Position the speaker so it will not interfere with the speaker board screws. If the speaker is too large to miss the screw positions, leave a projection of wood in the speaker hole for the screw to attach to (see examples of 5 inch and 8 inch speaker cut-outs). Remove the speaker and draw a circle ¼" inside the traced line. Use a saber saw to cut along the inside line. Drill holes in the speaker board that correspond to the mounting holes in the speaker. Countersink the holes on the side of part G that faces part A. The speaker is held in place by flat head machine screws and nuts. Cover the front of part G with grill cloth.

When all the holes are drilled and the speaker board is removed from the case, you can apply the finish. Since tastes have changed over the years, most modern finishes won't look very authentic on this project. The originals were usually finished with a dark varnish/stain. The closest thing I've found to the original is Super-Tex Britenal spray varnish/stain #B-804 which is marketed by Sprouse Reitz Co. Super-Tex Britenal #B-803 Walnut is also a close match. Some of the darker colors of Deft spray lacquer/stain also look similar to the original finish.

Once the finish is dry, install the speaker board and any other components. If you're using the dummy knobs, attach them with screws from the inside of the case. Screw the back in place and you're ready to enjoy Fibber Magee and Molly (if you have a tape!).

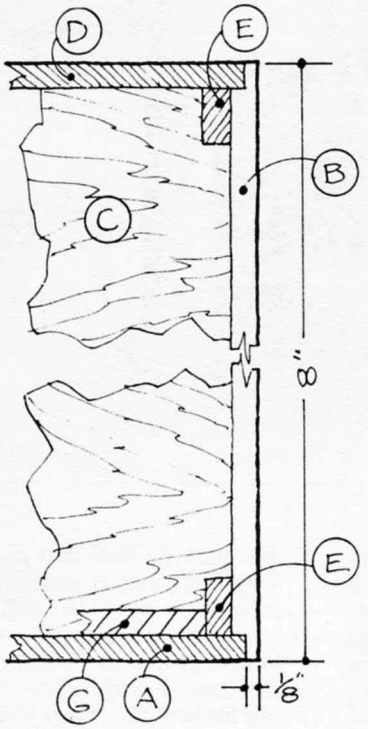




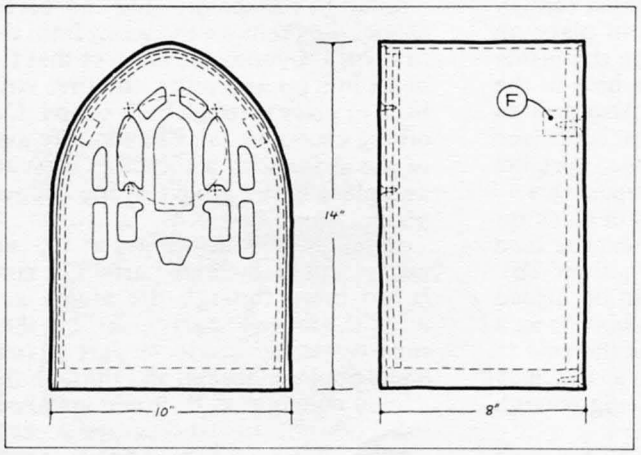


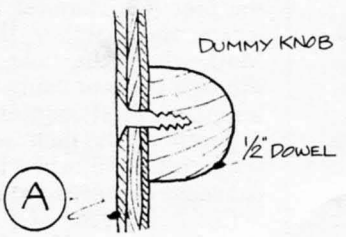
SPEAKER CUT-OUTS

NOTE: IF EQUIPMENT IS MOUNTED IN CASE, CUT VENT HOLES IN BACK.

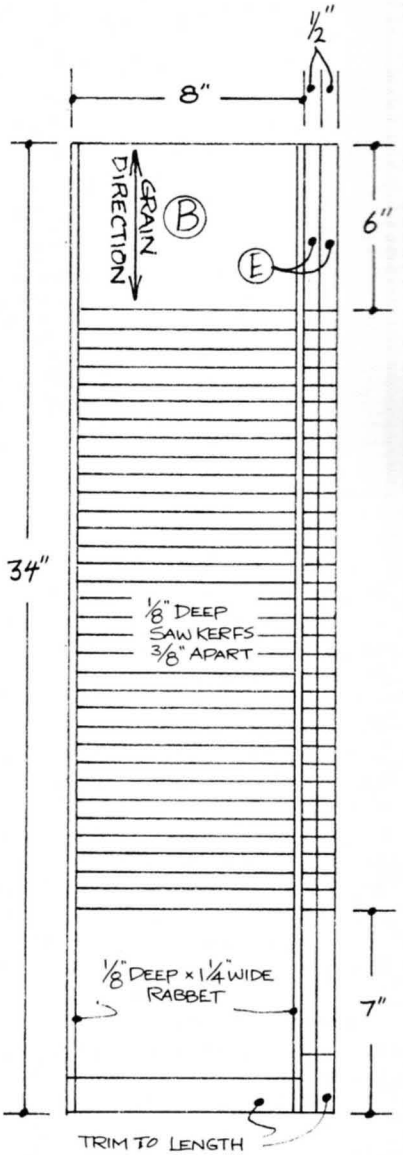


SECTIONAL TOP VIEW





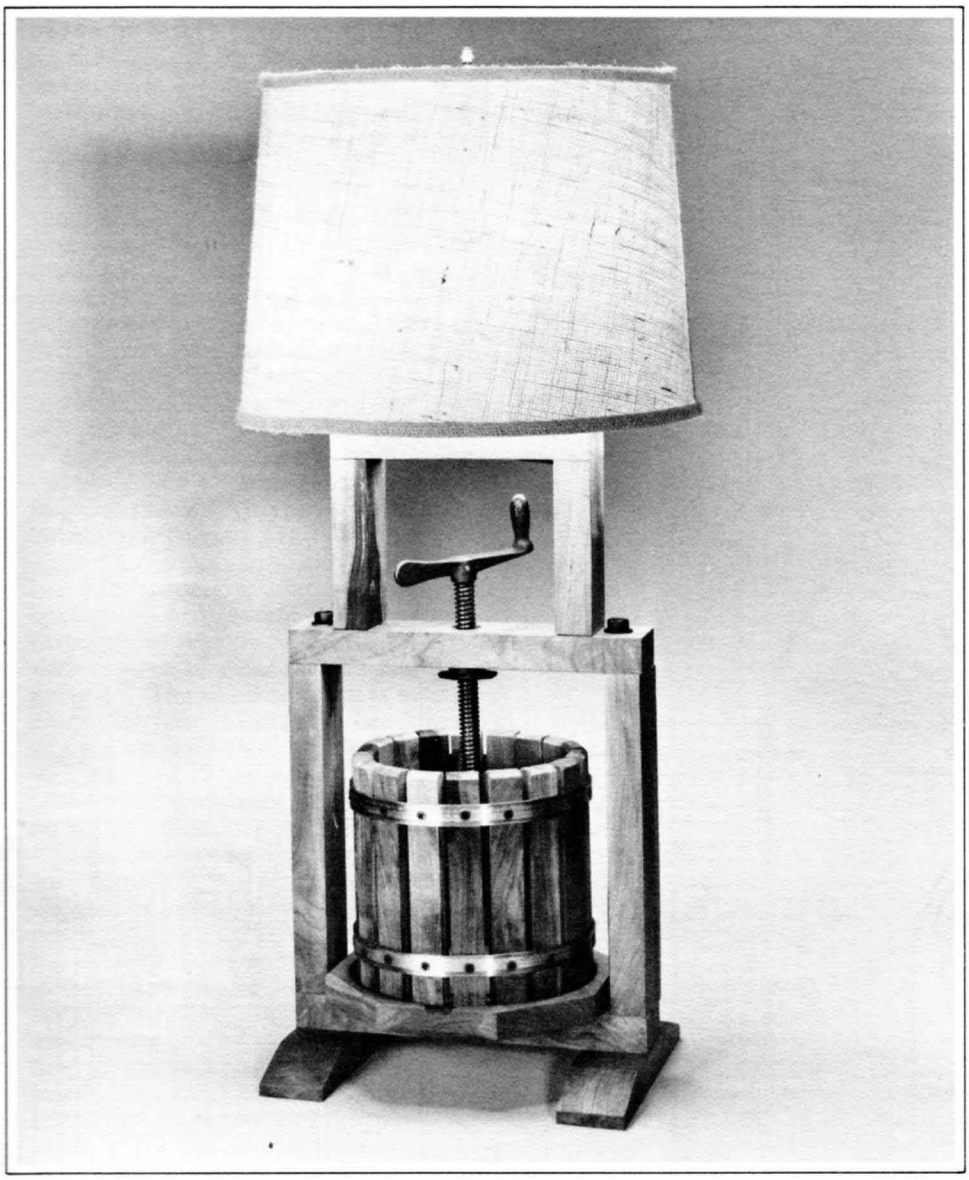
DETAIL C



DETAIL A

Cider Press Lamp

by Paul Levine



As I studied an antique cider press, it occurred to me that it could make a lovely lamp with just a few modifications. Basically, the modifications involved adding parts F and G (see Drawing) and some lamp hardware. However, if you'd rather have a working cider press, exclude parts F and G, but add plate (L) as shown in the Detail.

Except for the press screw (K), all parts for the project can be obtained at most hardware stores. Part K can be ordered from Woodcraft Supply Corp., 41 Atlantic Ave., Woburn, MA 01888. It's part number 03J21-AR and the price is $15.45 postpaid.

The one shown is made from cherry, but most any other hardwood would be suitable. Softwoods should be avoided.

Begin by cutting the 1⅜ inch thick by 2¼ inch wide stock for the frame (parts A, B, and D), yoke (parts F and G), and feet (part C). You will need approximately eight linear feet. For the frame cut two pieces 12 inches long (for part A) and two pieces 13 inches long (for parts B and D). Apply a 9/16 inch wide by 7/16 inch deep lengthwise groove along the inside of parts A to accept the ⅜ inch threaded rod (I). Holding the uprights (A) in place on the bottom (B), mark where the inside of the groove falls. Drill a hole in the bottom to accept the rod. Also drill an angled hole for the lamp cord (see Front Elevation). Turn the uprights over onto the top (D) and repeat this.

Cut two 10 inch lengths of stock for the feet (C), chamfer as shown, then locate them under the bottom (B). Mark where the hole is to be drilled through the feet using the bottom as a template. First countersink the hole to a depth of ⅝ inch with a 1¼ inch spade bit, then drill a hole big enough to accept the threaded rod.

Cut two pieces of stock to 8⅞ inch (part F) and one piece 9½ inch (part G) for the yoke. Lay out and cut the dovetails (see Detail), and the tenons. Place the yoke assembly on the top frame piece (D) and mark for the mortises. Groove part G and the right side part F to hide the wiring, then mortise the top of the frame (D). At this time drill and counterbore part G for the lamp nipple and locknut. The counterbore is 1 inch diameter by ⅝ inch deep. The through hole is ⅜ inch diameter.

Also, part D can now be drilled for the threaded nut of the press screw (K). It's held in place with a pair of wood screws. The frame (A, B, & D), yoke (F & G), and feet (C), along with the threaded rods (I), can now be assembled with glue. Use the threaded rods to help clamp the frame and feet. Use additional clamps for the yoke.

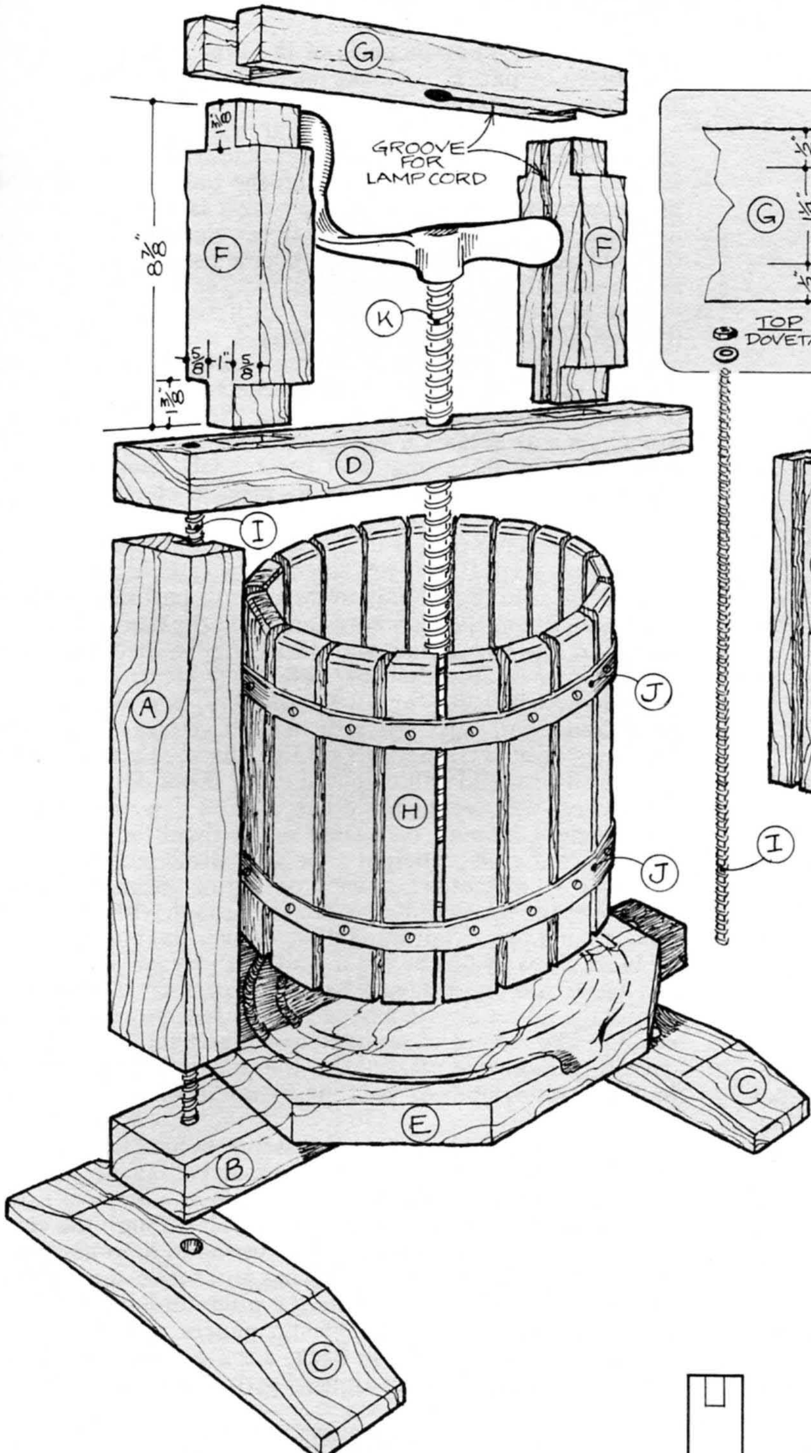
Next make the support plate (E) for the barrel. Cut 1 inch stock to 9⅞ inch square, and cut off the corners at 45 degrees to make the 4-1/16 octagonal sides. Mark the center, and using a router and a trammel, groove the top of the plate. A ½ inch core-box bit was used to remove the remaining stock in between the grooves. The outside diameter of the groove should measure 8¾ inches. The completed groove measures ¼ inch deep by 1½ inches wide. Groove out for the spout in the same fashion without the trammel. After sanding, attach the plate in place with two #10 x 2 inch flat head wood screws.

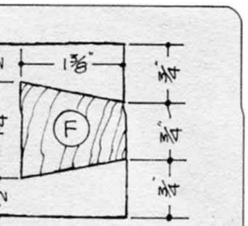
To make the barrel, buy two lengths of ¾ inch wide x ⅛ inch thick iron strapping (J). If your hardware store has galvanized straps, lightly sand the coating. You will be amazed how thin the coating is. Mark for eighteen holes, 1½ inches apart, starting ½ inch from one end of a three foot strap. From one inch stock cut eighteen strips (H), 1⅛ inch thick by 8 inches long. Line them up on a surface and draw lines one inch from the top and bottom, across all pieces. Drill the straps and lay one over the wood strips, lining up the top edge of the strap with the top pencil line. Attach with ¾ inch round or flat head wood screws. The other strap is attached to the bottom in the same manner.

Bend the assembly into the barrel shape, then remove the screw from the first strip. Overlay the strap so that the holes line up and screw the first strip back in place through both straps. Cut off the excess metal. Chamfer the tops of the strips with a router or a plane, and place in the groove of the support plate.

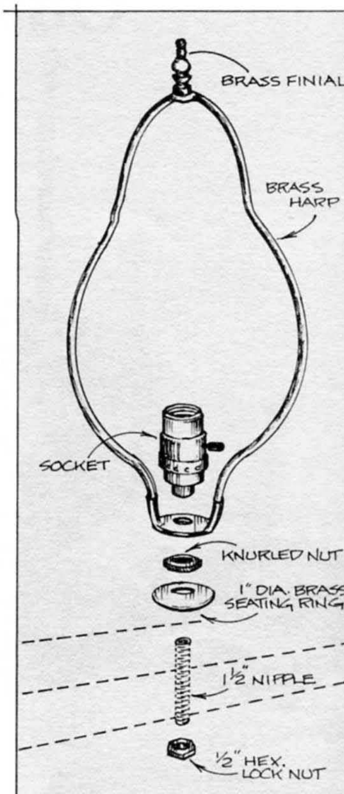
Refer to the drawing for the arrangement of the lamp parts. The cord is fed down through the nipple and into the groove in parts G & F. It then runs down the inside of part A (use double pointed tacks), and through the angled hole in part B. When installed, the shade should just cover the socket.

Give all parts a final sanding. Apply a coat of Watco Danish Oil and while wet rub on a coat of Minwax Ebony stain. The result is an attractive antique look.

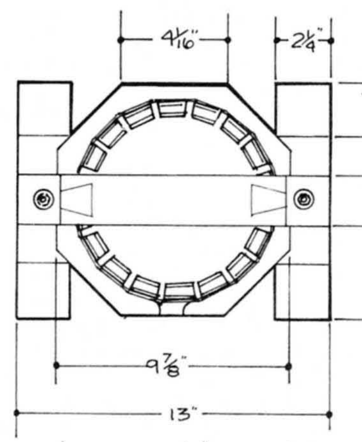


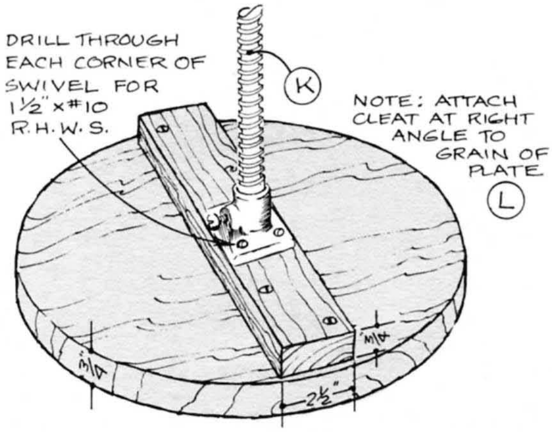


TOP VIEW
DOVETAIL JOINT

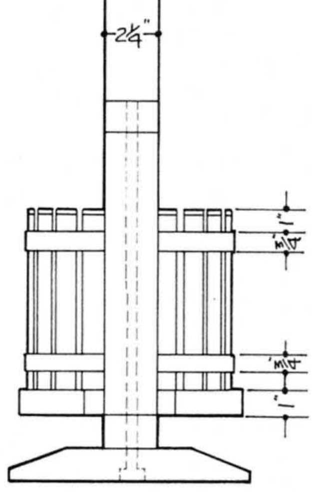


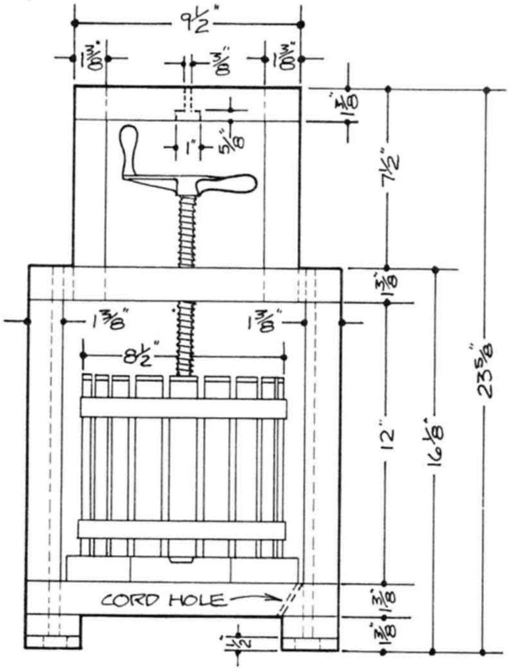
LAMP HARDWARE





DETAIL: PLATE (PART L)





Oak Hanging Light Fixture

by Ted Wheeler

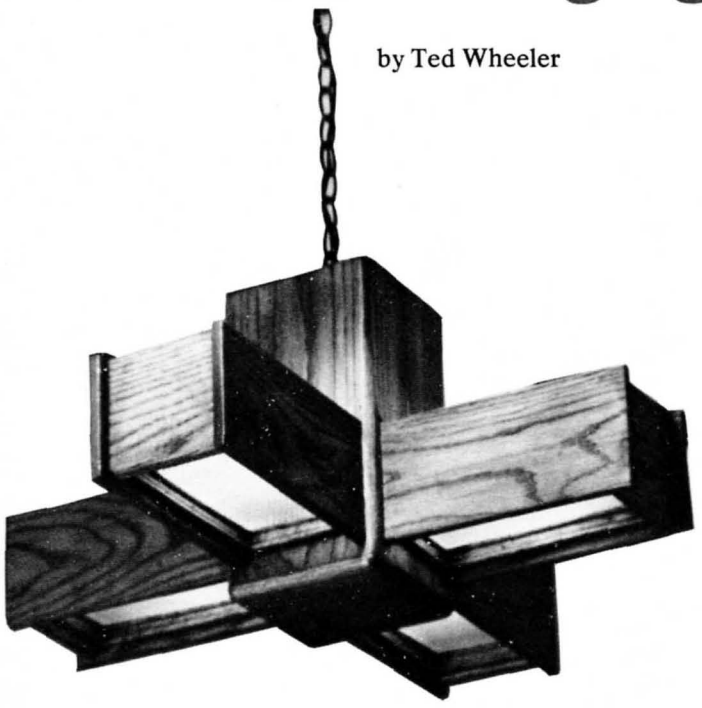


Photo by Author

Anyone who has gone shopping for light fixtures knows that you can pay a small fortune for anything that is in the least decorative. We faced that problem recently when looking for a fixture with at least a little wood in it to go in our new dining room addition. The room has stained oak trim, much like our new kitchen cabinets which were part of the same project. We priced a few fixtures close to what we had in mind, and after recovering my composure, I decided to make my own.

This fixture also uses ordinary 60 watt household bulbs which are much cheaper to replace than the decorative ones required in so many light fixtures. All electrical parts and other materials are common hardware and lumber store items. Total cost should be around twenty dollars. When compared to the hundred dollars and up you'll pay for anything similar, this fixture is a real bargain.

Start by cutting out all the pieces. Grain should run horizontally around the arms and vertically up the main body of the fixture. Give each part a thorough sanding, taking particular care to remove any planer marks. Do not round corners or edges at this time.

Start assembly on the main body (parts A & B) of the fixture. Use a good quality woodworker's glue on all joints. Be careful not to smear any on the outside surfaces as that will seal the pores and the wood won't accept stain in that spot. After the bottom (part F) piece is mounted, the body is ready to be "bullnosed" or rounded at the edges. This can be done using a router or shaper with a ½" radius bit. Round all except the top edges of this five-sided box.

Now determine which pieces of the arm assemblies (parts C, D, & E) go where and round all the lower edges, inside and out, using a ¼ inch radius bit. Also round the exposed ends of each side piece for the arms (part C). Be careful not to round edges that butt against other parts or the upper edges of the arms.

Before assembling the arms of the fixture you should mount the moldings (H) that go around the inside to hold the translucent plastic panels (G) in place. Miter each end to the correct length; mount one on the face of the fixture body and the other three on the inside surfaces of the arm pieces. Mount them ⅛ inch above the bottom edge of part D (⅜ inch above part C) using wood glue.

Part E, which provides a strong method for securing the arm assembly to the body, has two countersunk mounting holes for #8 by ¾ inch flat head wood screws. Add glue to one side, then secure part E to the body with the two wood screws. Later, all other parts of the arm assembly will be supported by part E, so make sure it's properly located on the body.

Locate and mount the porcelain sockets to part E as shown. It should be as high as possible without letting the bulb show over the arm side. With the bulb I used, the dimension to the centerline of the socket is 1½ inches (see drawing). This will allow room for circulation and prevent the bulb heat from damaging the plastic panels (G). To keep heat to a minimum, don't use a bulb larger than 60 watt.

Just above the wire terminals drill two ⅜ inch holes through parts E and the body (parts A and B). Using U.L. approved 16 gauge (heavy) lamp cord, pass the cord through these holes and wire the sockets as shown. Be sure to leave enough length to weave the wire through the fixture chain with at least 6 inches extra for the hook-up. Take your time and do a neat and careful job. Sloppy wiring causes fires. If you are not experienced in electrical work, have a licensed electrician do it for you.

Next, assemble part D to C. Use glue and clamp firmly. When dry, part C can be glued to part E, again using clamps. Be sure to add glue to the ends of part C and make sure there is good contact between C and the body. Allow to dry, then remove clamps and drill for 3/16 inch diameter dowel pins to reinforce parts D and E.

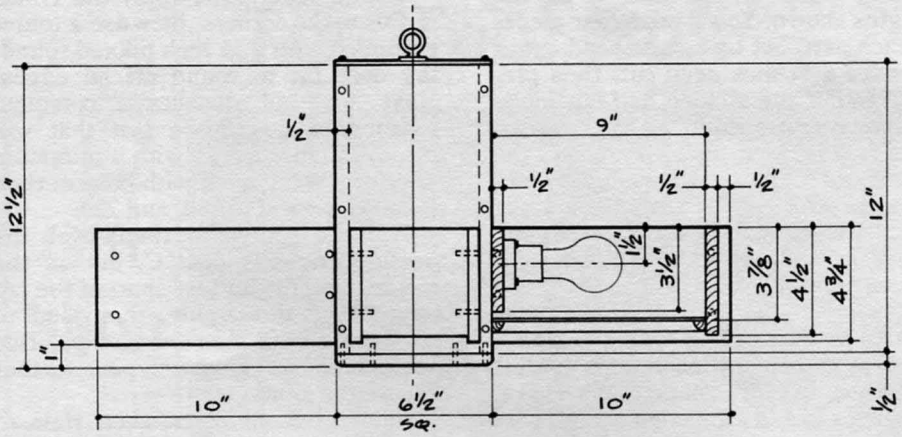
If you aren't ready to quit for the day, now would be a good time to cut your plastic panels. If you have the type that is widely used in flourescent light fixtures you will find that it is brittle and will chip and crack if not cut properly. The easiest way would be to use a band saw with a fine tooth blade. I cut mine on a table saw without too much difficulty. Set the blade height so it just barely cuts through, then hold a block of scrap wood on top of the material directly over the blade while pushing it through with the other hand. Do not place your hand directly over the blade, grasp the block a few inches before it, and don't forget your safety glasses. If you don't have a band saw or a table saw, you can cut the material with a circular saw. Just provide a solid backing, like a piece of scrap plywood, and set the blade to just cut through the plastic. Cut the panels a little smaller than the inside dimensions of the fixture arms so they go in easily.

Give the entire piece a final sanding before finishing. I used Tungseal Dark Oak oil base stain and spray lacquer.

Now connect the chain to the steel strip as shown. Weave the lampcord through the chain and run it through the center hole of the fixture plate. Get someone to help hold the fixture while you connect the wiring and screw the fixture plate into your ceiling box. Note the grounding instructions on the drawing. Install the plastic panels and the bulbs (maximum 60 watts). Stand back, admire a job well done and take someone out to dinner with the money you've saved.

Bill of Materials
(All Dimensions Actual)

Part	Description	Size	No. Req'd
A	Body End	½ x 6½ x 12	2
B	Body Side	½ x 5½ x 12	2
C	Arm Side	½ x 4¾ x 10	8
D	Arm End	½ x 4½ x 4½	4
E	Arm Support	½ x 3½ x 4½	4
F	Bottom	½ x 6½ x 6½	1
G	Panel	⅛ x 4-7/16 x 8-15/16	4
H	Molding	½" quarter round	As req'd
I	Porcelain Socket	2"	4

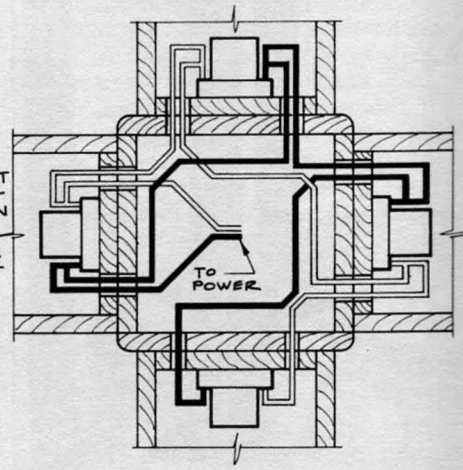


SIDE ELEVATION

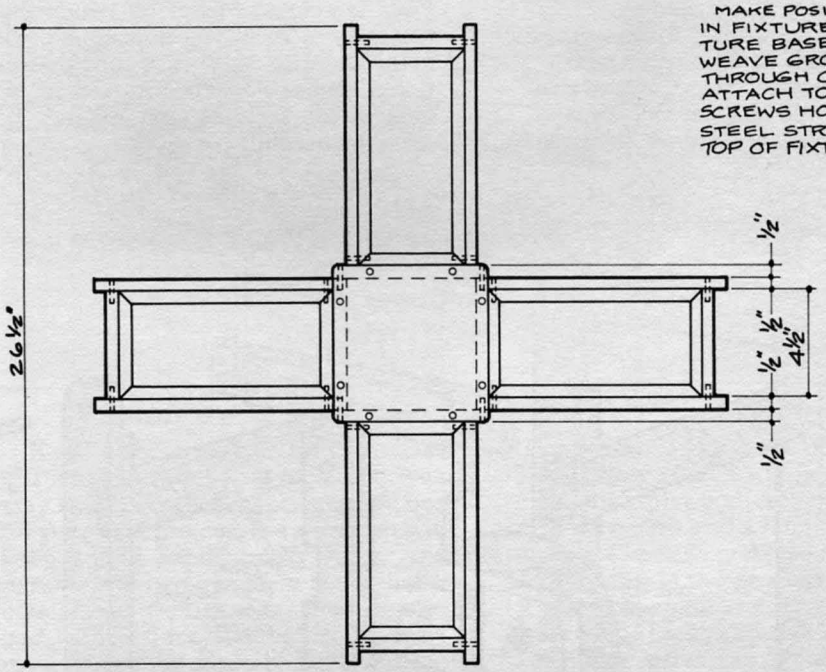
WIRE LIGHT SOCKETS IN PARALLEL WITH ALL CONNECTIONS MADE ON SOCKET TERMINAL SCREWS.

GROUNDING:

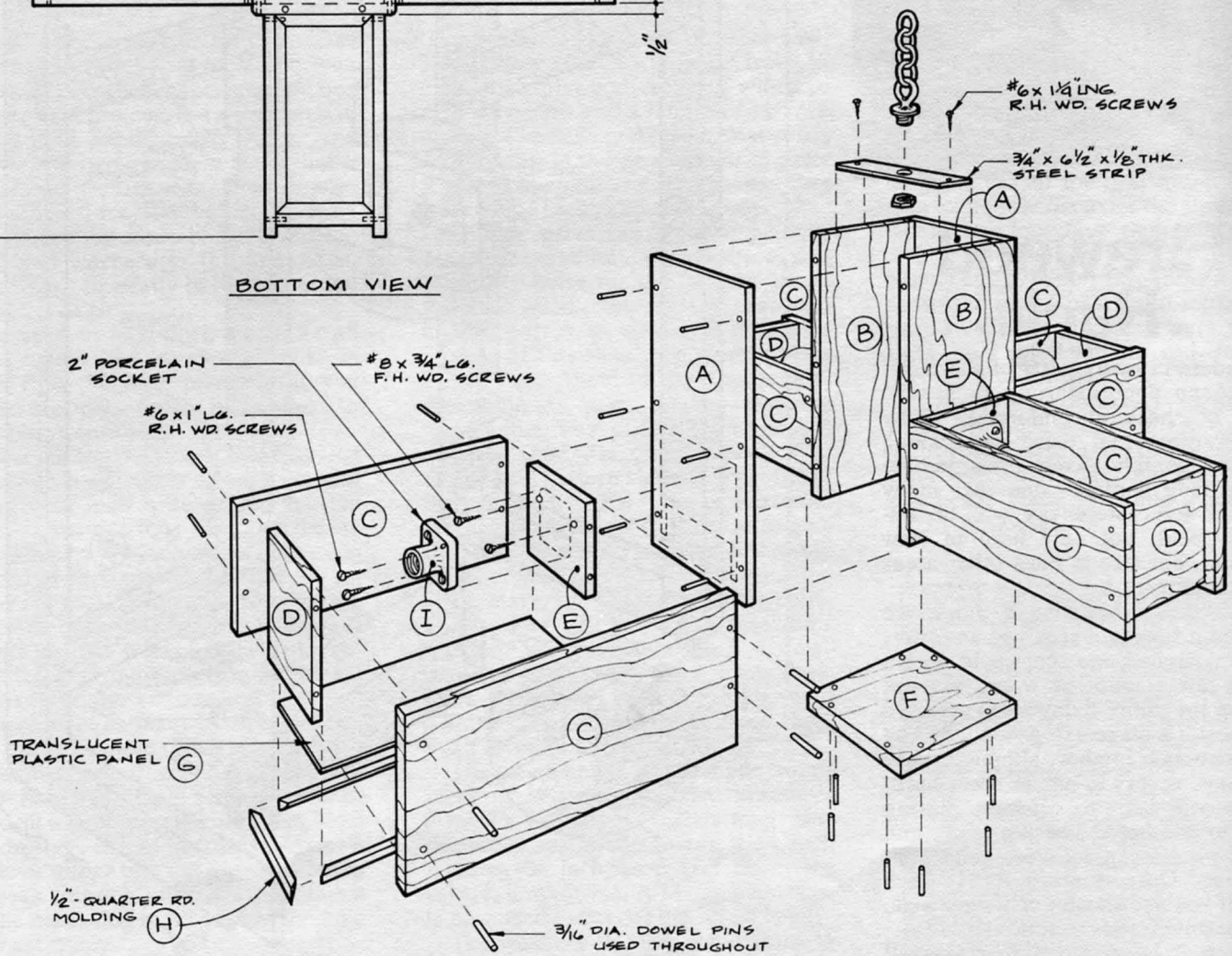
MAKE POSITIVE CONTACT IN FIXTURE BOX TO FIXTURE BASE PLATE, THEN WEAVE GROUND WIRE THROUGH CHAIN AND ATTACH TO ONE OF THE SCREWS HOLDING THE STEEL STRIP TO THE TOP OF FIXTURE BODY.



WIRING DIAGRAM



BOTTOM VIEW



Art by The Drawing Board, Naugatuck, CT

Firewood Rack

Readers in many parts of the country are no doubt starting to sample some of those uncomfortably chilly temperatures that come right along with the late fall season. It's a prelude to the long winter - one that many weather forecasters say will be unusually cold, not only here in New England, but also in most other areas of the country.

With those thoughts in mind, we decided a firewood rack was in order, so we designed one that could hold a pretty fair amount of wood, yet not take up the entire living room area. To save cost it's made using standard 2 by 4 construction lumber, although those who have access to oak or other hardwoods will want to consider putting them to use here. The lap joints and dowel pins make for very solid construction. Ours is sized for 18 inch logs. If you use shorter or longer logs, change dimensions to suit.

Select 2 by 4 stock that is well seasoned and free from any warp. Avoid any with loose knots. Begin by cutting parts A, B, and C to the lengths shown. You'll need four pieces of each part. Set up a dado head cutter to make a ¾ inch deep cut, then proceed to cut the sixteen half-lap joints as shown in the exploded view. When cutting the joint in part A for the stretchers (C), make them slightly less than the width of the stretchers. Later when the stretchers are sanded, the slight reduction in width will make for a good snug fit.

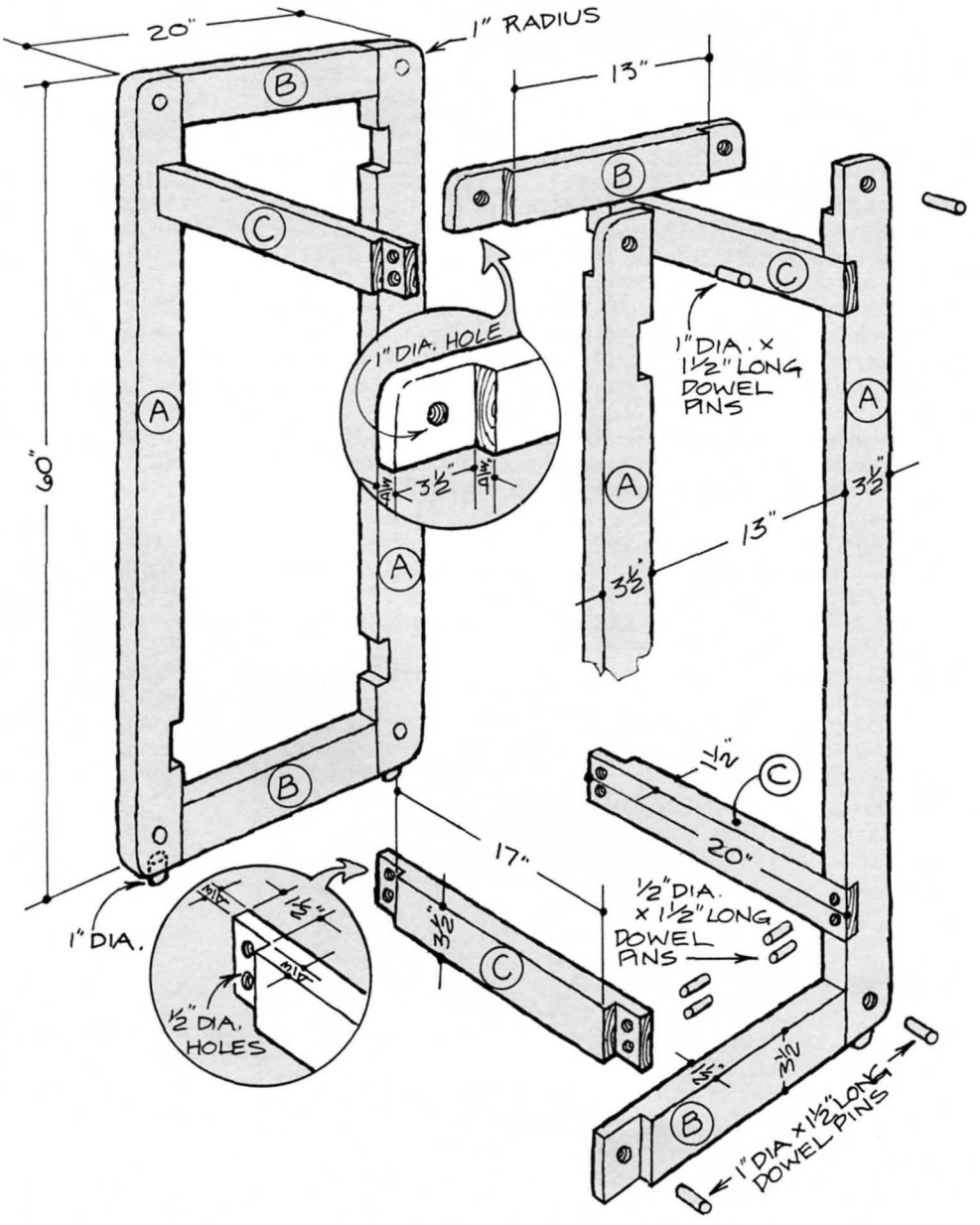
Assemble the two frames (parts A & B) as shown. Use glue and clamp firmly with bar or pipe clamps to pull the edges in close contact. It's also a good idea to add a C-clamp at each corner to squeeze the lap joint faces together. Be sure to use clamp pads in conjunction with the clamps.

When dry, drill a 1 inch diameter hole through each joint to take a 1½ inch long dowel pin. Cut the pins so they protrude on each side about 1/32 of an inch. This allows them to be sanded flush with the surface.

With a saber saw, apply the 1 inch radius to the corners, then use a router equipped with a ¼ inch piloted rounding over bit to round off all edges. Next, give all surfaces a complete sanding. Start with a grit that will remove planer marks with a minimum of effort. We started with 80 grit, then followed with 100, 150, and 220.

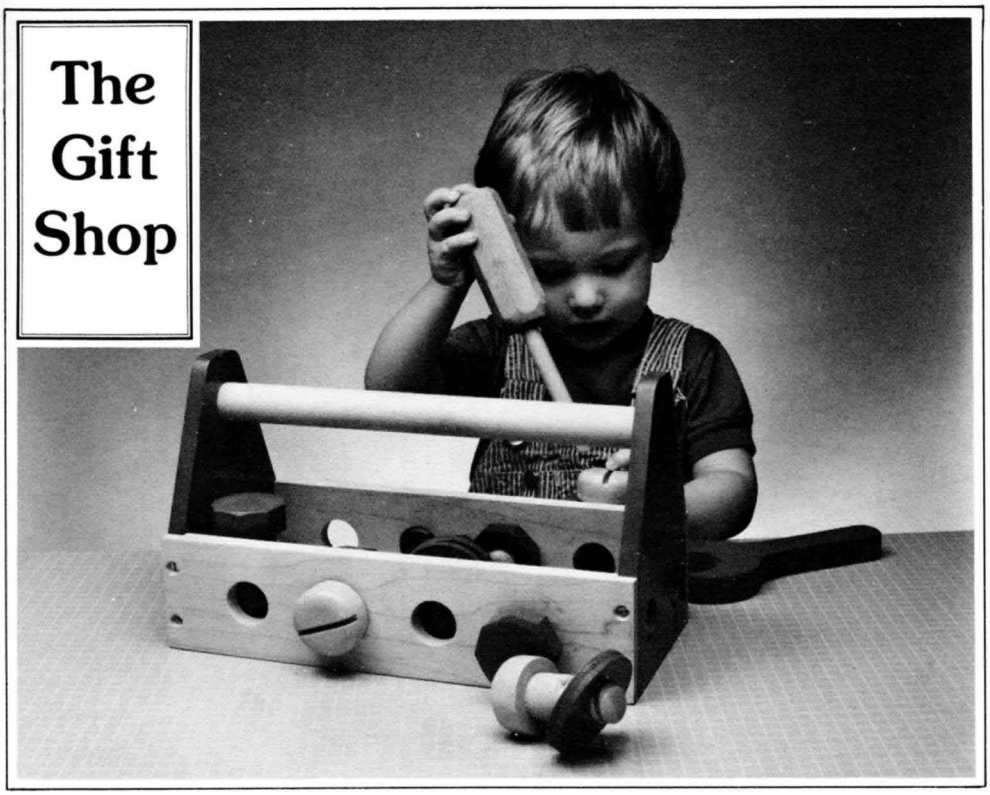
Use the router to round-over the outside edges of part C, but on the inside, stop the bit just short of the lap joint. Sand thoroughly, then joint to the frames with glue and clamps. Two ½ inch diameter dowel pins further secure the joint.

Final sand all parts, then stain to suit. Two coats of polyurethane varnish will provide a durable final finish. Four feet in the form of 1 inch diameter by ¾ inch long dowel pins, will help stabilize the rack on uneven floors. These feet are inserted in ⅜" deep holes so they will extend ⅜" from the bottom.



Toy Tool Box

The Gift Shop



If you've been looking for Christmas gift ideas for a favorite little one, you may want to consider this cute toy box for your next project. It's a toy that will keep young hands pretty busy, and parents will be pleased to learn that it educates as well as entertains. Equipped with a sturdy wrench and screwdriver, the child assembles the screws, bolts, and washers to the box sides. And they all fit neatly in the box at the end of the day.

We used ½ inch thick maple for all parts except the wrench, which is made from ¾ inch plywood. If you choose to apply a finish, be sure to use one that's non-toxic.

After cutting parts A & B to size, set up a dado head cutter to cut a ¼ inch deep by ¼ inch wide groove for the plywood bottom (C). Also cut the ¼ inch deep by ½ inch wide rabbet on the end of each part B. Lay out the locations of the 1⅛ inch diameter holes, then bore out with a spade bit. Be sure to back up the workpiece with scrapstock to prevent splintering as the bit breaks through.

The 1 inch diameter by ¼ inch deep hole for the handle (D) is best cut with a Forstner bit, if you have one. Because they don't have a spur, Forstner bits drill a flat hole, making them ideal for drilling holes like this. With a spade or auger bit, the spur will begin to break through the other side and it will be necessary to fill or plug the hole after assembly.

Part A tapers to 1½ inches at the top. Use a pencil to lay out this taper, then cut out with a band or saber saw. The bottom (part C) is made from ¼ inch birch plywood cut to a width of 4-15/16 inches and a length of 11-7/16 inches. Check to make sure that it fits comfortably in the grooves cut in parts A and B, keeping in mind that sanding will reduce the thickness slightly.

All box parts can now be given a complete sanding. Counterbore and drill pilot holes for the ¾ inch by #8 flat head wood screws. If you choose to enamel part A, as we did, it should be applied at this time. We made ours a bright red. Allow to dry thoroughly. Assemble all parts as shown using wood glue. The plywood bottom (C) does not need to be glued in place.

The grid pattern shows the profile of the wrench (E). For maximum strength use plywood. Be sure to give the surfaces a good sanding and round off all edges.

To make the threaded nuts, bolts, and screws you'll need a threadbox and tap. Conover Woodcraft Specialties, Inc., 18125 Madison Road, Parkman, OH 44080, sells one for around $70.00, or you can get one from them in kit form for about $50.00.

The screw heads (J) are made from a piece of ¾ inch stock that measures 2 inches wide by 12 inches long. Use the table saw blade to run a ⅛ inch wide by ¼ inch deep kerf down the center, lengthwise. A 1¾ inch holesaw is now used to cut out the screw head.

The washers (H) are made from ⅜ inch stock. A 2¼ inch holesaw is used to cut them out. A 1⅛ inch spade bit cuts the center hole.

To make the eight nuts (G), cut a piece of ¾ inch thick stock to a width of 2¼ inches and a length of 26 inches. The extra length and width is needed to prevent splitting when the thread is tapped. The extra length also makes it safer to do the crosscut operation. Lay out the location of the nuts along the stock, then drill and tap the holes. Now rip ¼ inch off each side of the stock (the stock is now 1¾ inches wide with the tapped holes in the middle). The tap will probably cause some splintering, so use a sharp plane to smooth the surface. This will reduce the thickness to about ⅝ inch. Next, use the miter gauge to crosscut the stock into 1¾ inch squares (with the hole at the center). Following this, the bandsaw is used to make the four 45 degree corner cuts. The four boltheads (I) are made in essentially the same manner except reduce the length of stock to 10 inches. And a 1 inch diameter by ⅜ inch deep hole is drilled rather than tapped.

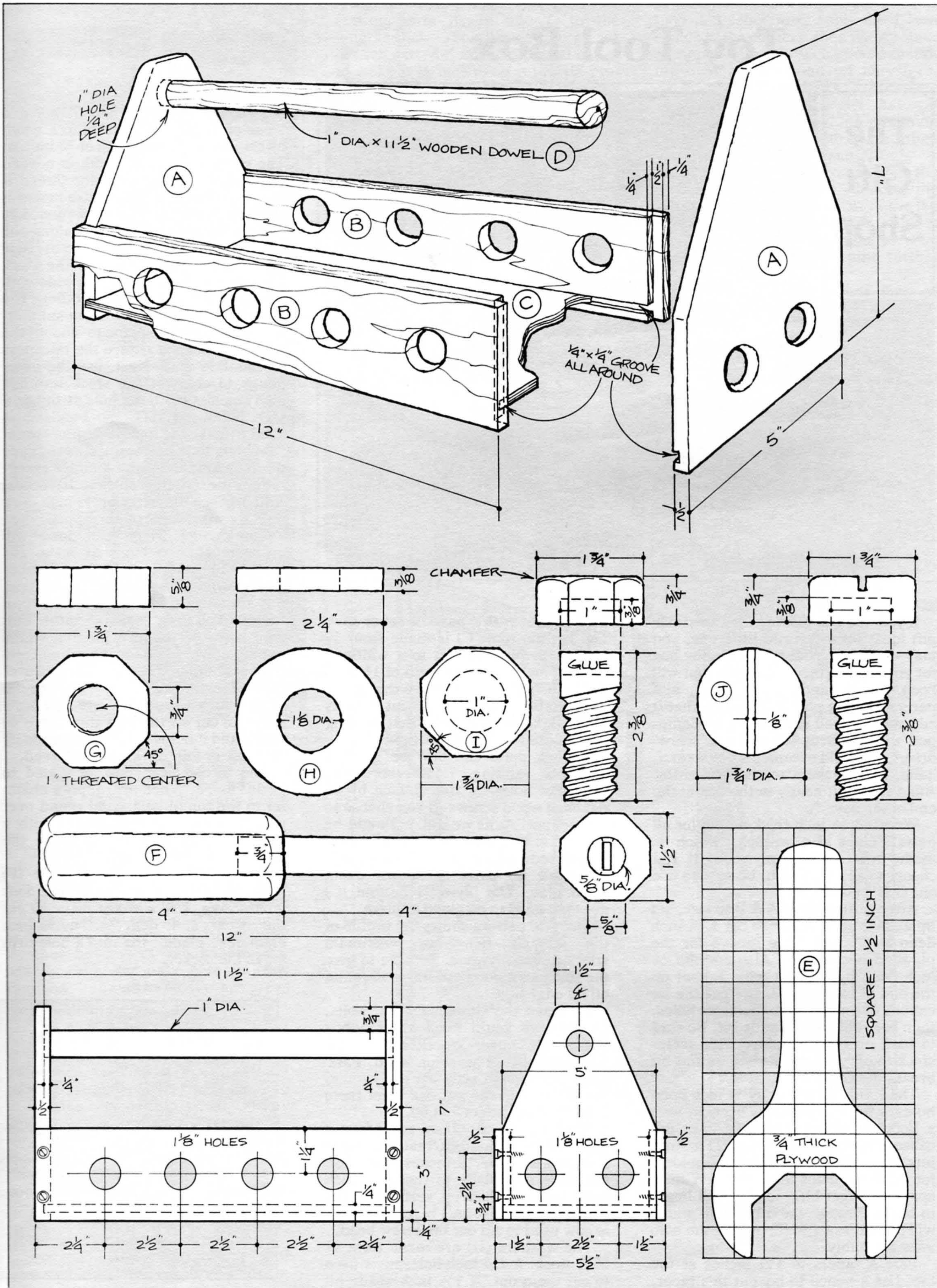
Three feet of 1 inch birch dowel will be more than enough to make the threads for parts I and J. Most lumber yard dowel stock is out-of-round, and this sometimes causes threading problems. You may want to lathe turn your own, or you can purchase high quality dowel stock for threading from Conover. Sometimes the first two or three threads don't cut cleanly, so it's a good idea to run the thread a little long and cut off the first three. We've also found it helps to let the threads sit for three or four days, then rethread.

The threads can now be glued to parts I and J. When dry, apply a chamfer to the top of part I and round over part J. We spray coated ours with a light coat of enamel, red for the screws, blue for the bolts.

Make the screwdriver handle (F) from 1½ inch square stock cut four inches long. Use a sharp plane to cut the corners at 45 degrees. The ⅝ inch diameter "blade" fits into a hole drilled in the socket.

Bill of Materials - Toy Tool Box
(All Dimensions Actual)

Part	Description	Size	No. Req'd
A	Box End	½ x 5 x 7	2
B	Box Side	½ x 3 x 12	2
C	Bottom	¼ x 4-15/16 x 11-7/16	1
D	Handle	1 Dia. x 11½	1
E	Wrench	See Detail	1
F	Screwdriver	See Detail	1
G	Nut	See Detail	8
H	Washer	⅜ x 2¼ Dia.	8
I	Bolt	See Detail	4
J	Screw	See Detail	4



1" DIA HOLE 1/4" DEEP
1" DIA. x 11 1/2" WOODEN DOWEL
D
A
B
C
1/4"
1/2"
1/4"
1/4" x 1/4" GROOVE ALL AROUND
12"
5"
7"
1/2"
CHAMFER
1 3/4"
5/8"
3/8"
3/4"
1"
3/8"
G
45°
1" THREADED CENTER
2 1/4"
1 1/8 DIA.
H
1" DIA.
I
1 3/4" DIA.
GLUE
2 3/8"
J
1/8"
F
4"
4"
1 1/2"
5/8" DIA.
5/8"
E
1 SQUARE = 1/2 INCH
3/4" THICK PLYWOOD
12"
11 1/2"
1" DIA.
1/4"
1/2"
1 1/8" HOLES
1 1/4"
3"
2 1/4"
2 1/2"
2 1/2"
2 1/2"
2 1/4"
1 1/2"
5"
1/2"
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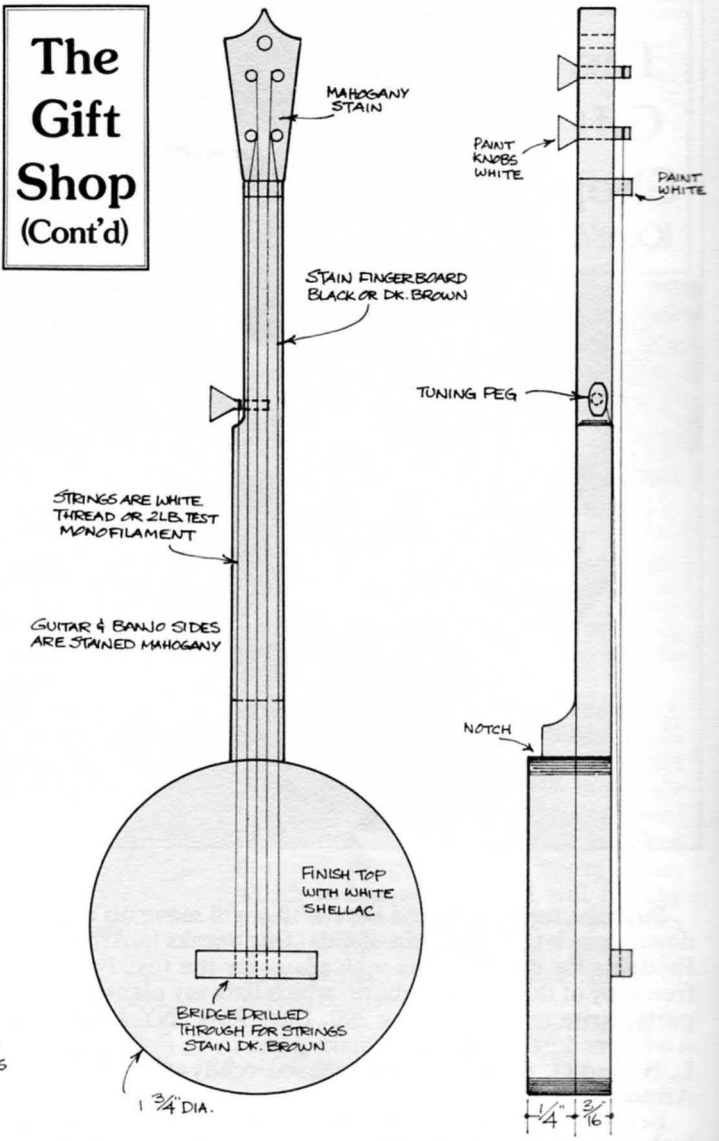
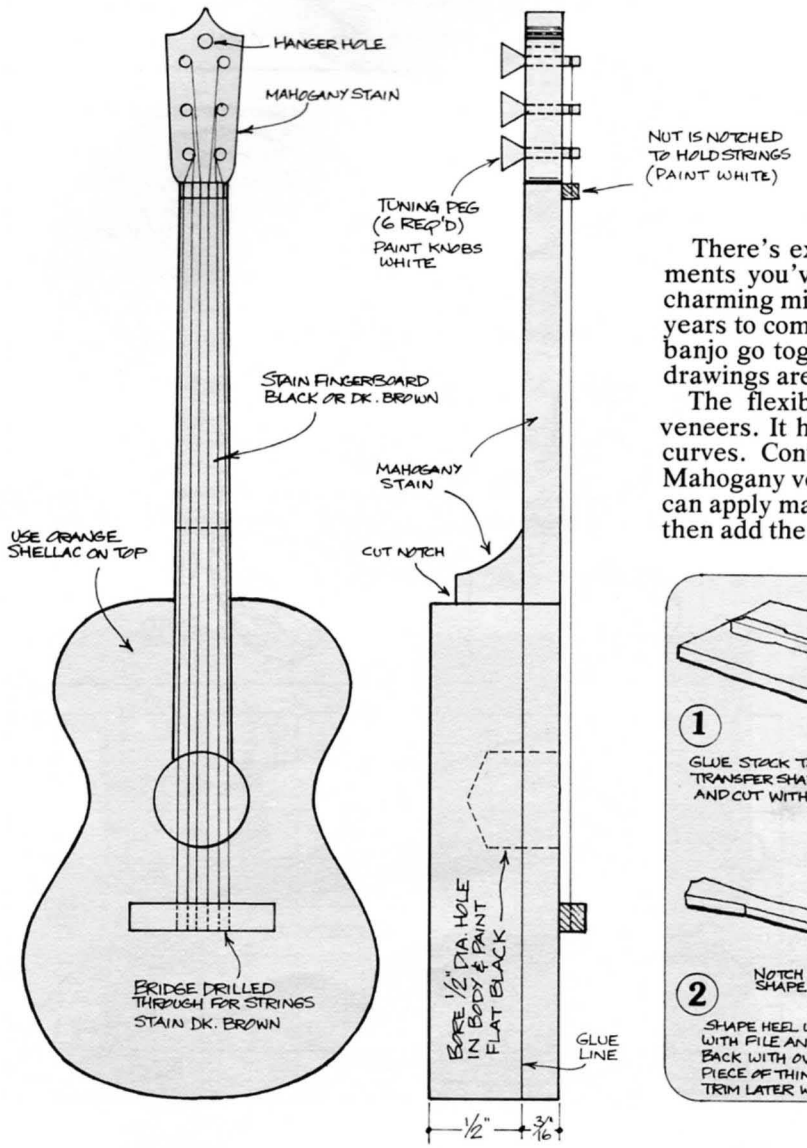
5 1/2"

The Gift Shop (Cont'd)

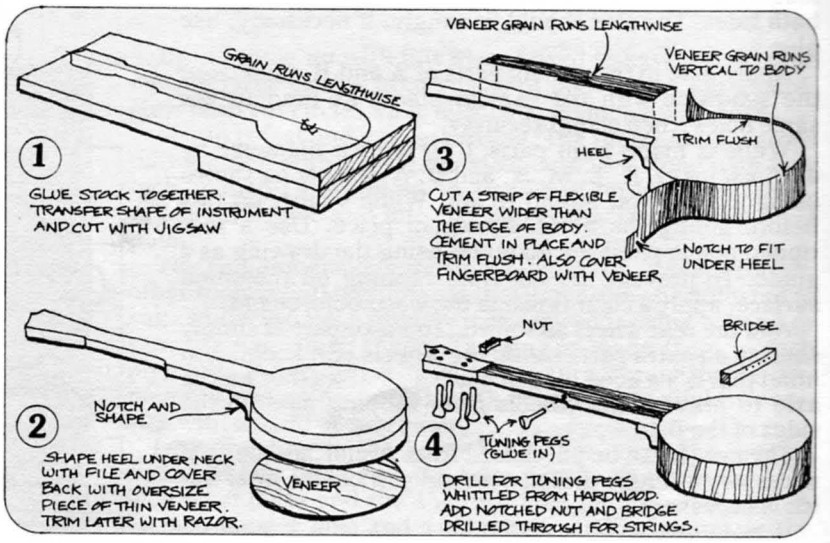
Tree Ornaments





There's extra pleasure in decorating the Christmas tree with ornaments you've made yourself. Hung with slender red ribbon, these charming miniatures will add a unique decorative touch to your tree for years to come. The step-by-step drawings show how the parts for the banjo go together but the same procedure applies to the guitar. The drawings are full size for tracing.

The flexible veneer is available from mail-order firms that sell veneers. It has a thin backing and can be easily bent to the required curves. Contact cement makes the veneering job quick and easy. Mahogany veneer looks best but if you have scraps of other types, you can apply mahogany stain. Finish with a few coats of varnish or shellac then add the strings and red ribbon.



The Gift Shop (Cont'd)

Willie & Tuna

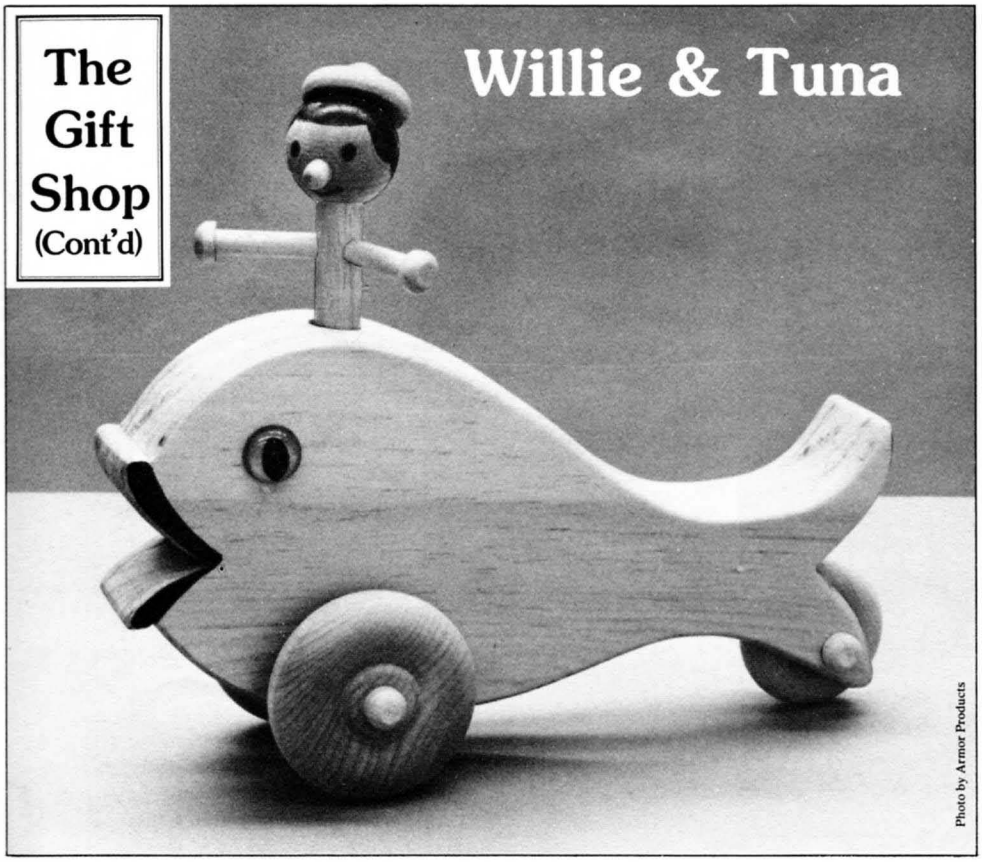


Photo by Armor Products

Push the tuna along and little Willie will move up and down - much to the delight of kids. Our thanks to Armor Products for providing us with plans for the toy. For a free copy of their toy brochure, which lists toy plans and parts, write to them at Box 290, Deer Park, NY 11729. And if readers prefer not to make parts C, E, F, G, I, K, L, N, and O, they can be purchased ready-made from Armor.

Begin by making part A. Cut ¼ inch stock to a 3¾ inch width by 8 inches long. The ¼ inch stock can be cut from 4 inch lattice which is available at most lumber yards. Also, at this time, cut ¾ inch stock to the same width and length for part B. Sandwich part B between parts A and brad together without glue. Next, transfer the tuna profile from the grid pattern and cut out with a band or saber saw. Also drill the holes for the eye and front and rear axles.

Separate the "sandwich" and re-cut part B along the dotted lines (see grid pattern) to allow room for the cam (C) and rear wheel (F). The ½ inch diameter hole for Willie can now be drilled.

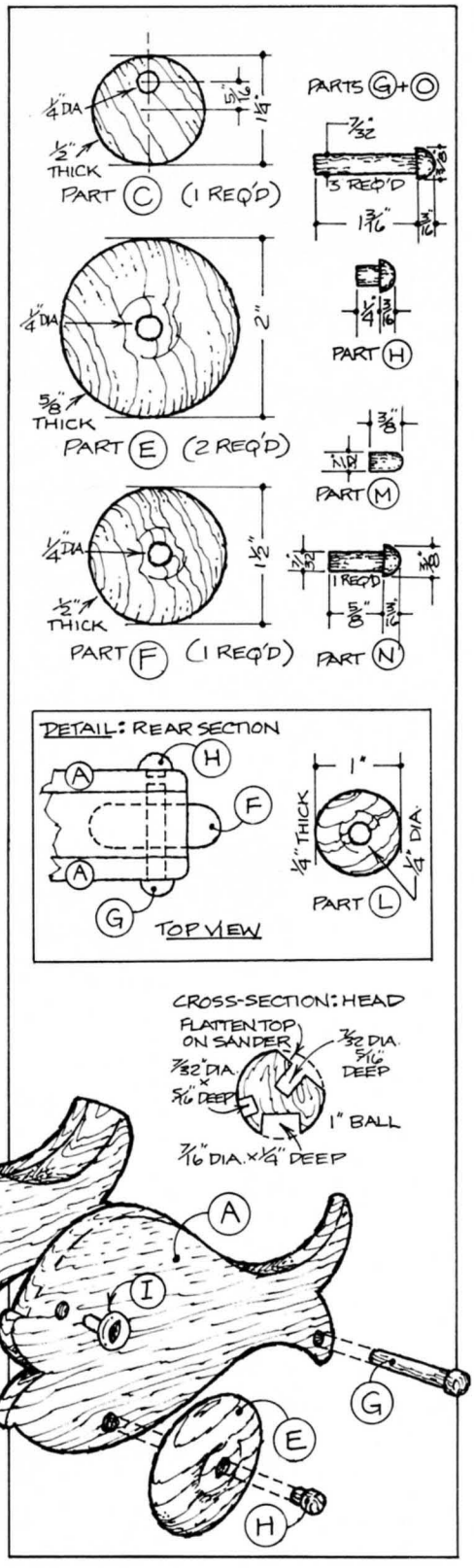
Next, insert part D (¼ inch diameter by 2⅜ inch long), through the cam, letting it protrude equally from both sides. The axle should fit snugly. If necessary, use glue.

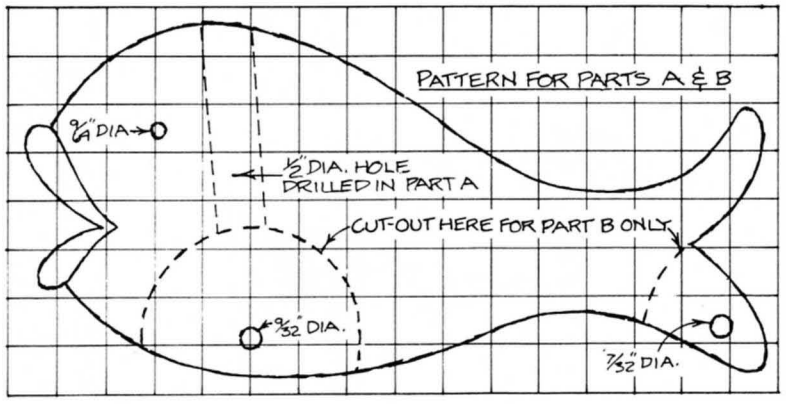
Apply glue to the mating parts of A and B, then close the sandwich with the cam in place. Re-brad in the same holes, then clamp securely.

Willie is made from parts J (7/16 inch diameter by 4¼ inch long), K, L, M, N, and O. Assemble as shown using glue. If you intend to add Willie's face, do this before gluing the hat and nose in place. Use a felt-tipped pen to paint the features, using the drawing as a guide. To prevent the ink from running on the wood surface, apply a clear finish to the wood beforehand.

Add the rear wheel as shown. To make part H simply shorten an extra part N. Add the wheels (E), keeping in mind that it's a good idea to place a steel washer on the axle to prevent the wheels from rubbing against the sides of the fish.

The eye (I) can be purchased from Armor, although if necessary a simple drilled hole will suffice. No final finish is necessary.



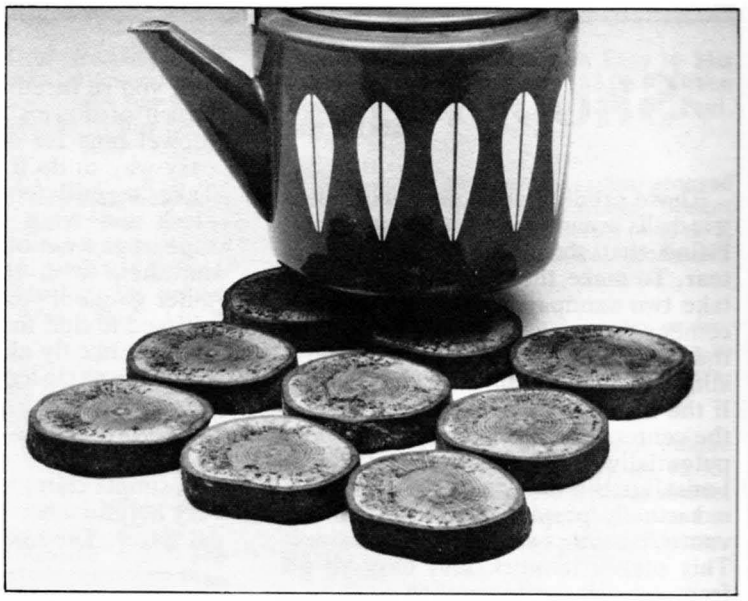


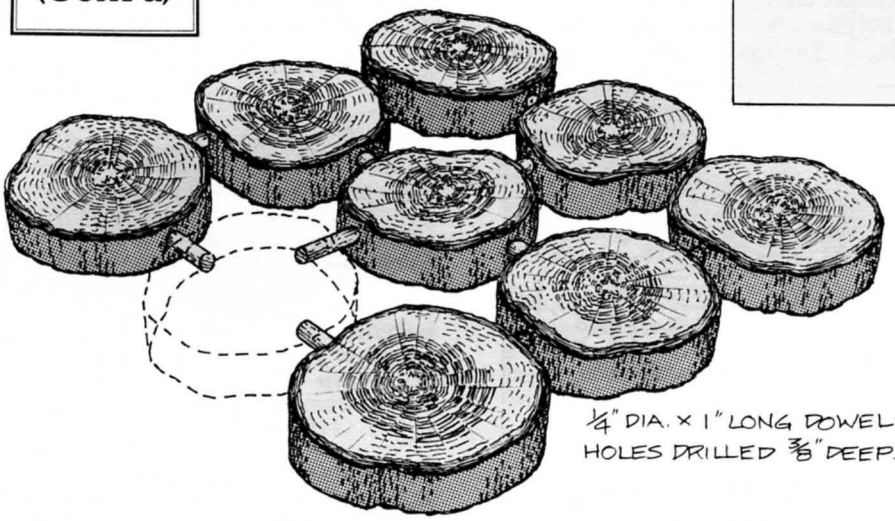
Woodpile Trivet

The Gift Shop (Cont'd)

A firewood pile can often provide more than just BTU's on a bitter cold night. With a minimum of work, a short log can be transformed into an eye-catching trivet that's going to invite lots of compliments.

There's no hard and fast rule that dictates the size of the log, but we used one with a diameter of about 2¾ inches. Each disk was cut to a ½ inch thickness. You'll want the wood to have an interesting figure, so it may be necessary to slice a few logs to find one you like. However, be sure to use a log that's well seasoned or there will be splitting problems.

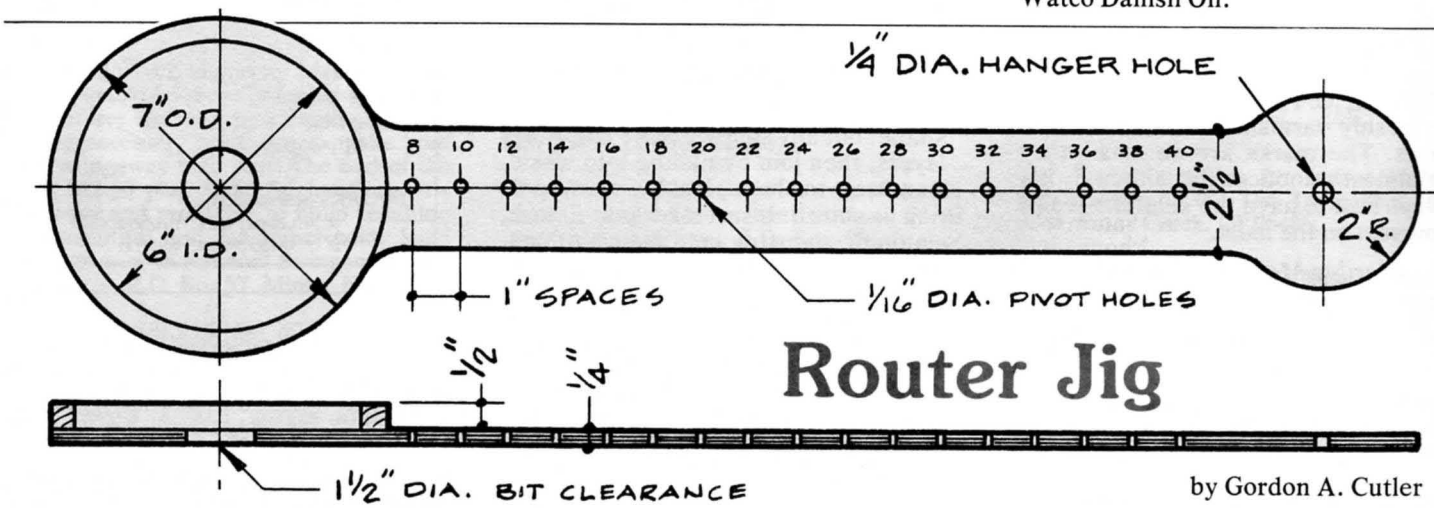


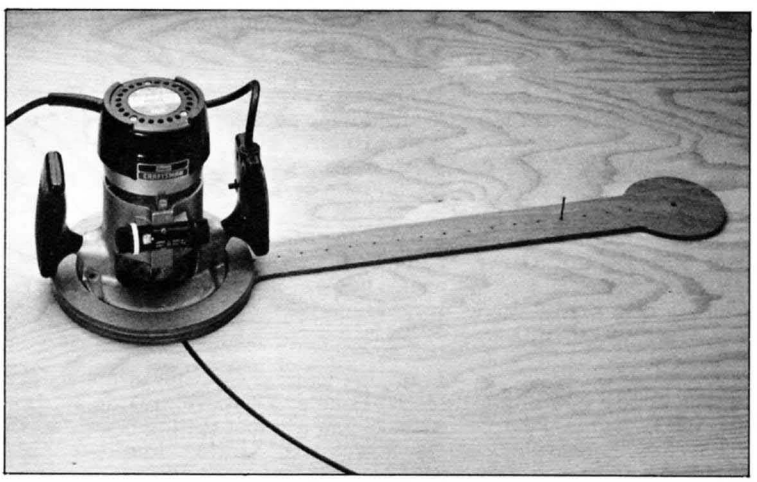


Locate the dowels 90 degrees apart, then drill 5/16 inch diameter by ⅜ inch deep holes for ¼ inch diameter dowel pins. The extra 1/16 inch hole diameter allows for any misalignment of the dowel pins. The pins are then secured in place with epoxy glue, which is fast setting and will fill any gaps in the hole. Sand both sides smooth, finishing with 220 grit, then final finish with an application of Watco Danish Oil.

Router Jig

by Gordon A. Cutler





Until I came up with this idea, I used to have a hard time cutting large circles from sheets of plywood or hardboard. Now I can cut circles up to 40 inch in diameter with ease.

Set up is fast and it's easy to use. The router simply drops into the ring with a snug fit. Most cutting is done with a ¼ inch diameter straight bit. A small nail through the appropriate pivot hole and into the plywood serves as the pivot point.

The ring dimensions shown are based on a Sears router; other routers will require that the dimensions be adjusted to suit. Make the base from ¼ inch plywood, using a band or saber saw to cut to shape. The ring is made from ½ inch plywood. A flycutter is used to cut an accurate inside diameter. The outside diameter can be rough cut slightly oversize with a band or saber saw.

Glue the ring to the base. When dry, sand the outside ring diameter flush with the base. Locate and drill the 1/16 inch pivot holes and the 1½ inch hole for the router bit. A ¼ inch hanger hole and a thorough sanding complete the project.

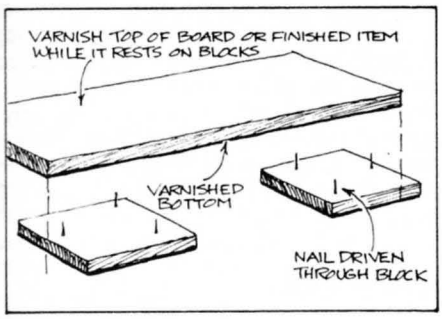
Shop Tips

Those sanding discs used with electric drills are made with thin paper and I find that they easily crumple and tear. To make them last longer I now take two sandpaper discs and contact cement them together back to back. If the center holes have four perforated slits, I make sure the slits are aligned. If the disc has more than four slits at the center, I've found that this area is potentially weak. To strengthen it I misalign the slits.

I usually prepare a few sets in advance, backing two different grit sizes. This makes it quick and easy to go from one grit size to another.

Donald Saunders, Bendersville, PA

These small blocks are great for drying boards or small light projects that have just been varnished. Simply place



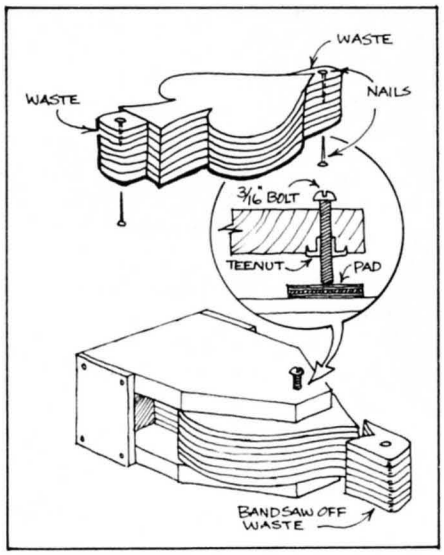
the freshly varnished side on the nail points. The marks are so small they are almost unnoticeable, although it's always best to have the side that won't show rest on the nails.

Marilyn Malcolm, Coldwater, MI

If you're faced with having to cut a bunch of dowels all the same length (dowel pins for example), here is an easy way to do it using the bandsaw. Take several long lengths of dowel stock and wrap them with masking tape at the cut-off points, then crosscut them with the bandsaw. Use a miter gauge if you have one. You'll be pleased to find that the dowels neither splinter nor fly all over, and they will all be the same length.

G.J. Barber, Verona, WI

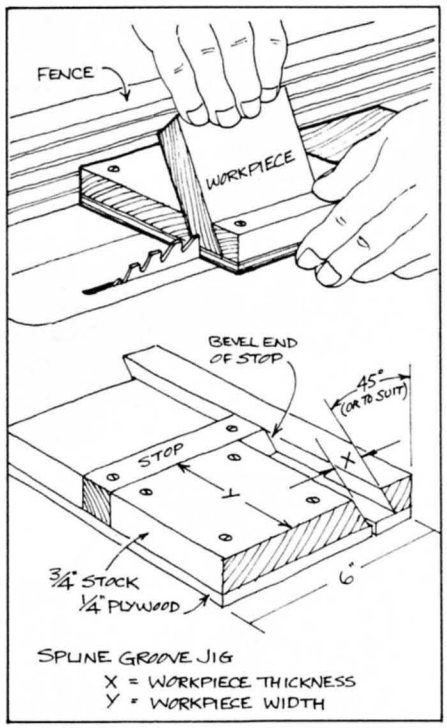
A simple clamping fixture like this is very helpful when band sawing identical parts. The sketch shows a spade



shape, but any shape can be cut. Stack layers, then join by nailing into waste. Band saw to shape, leaving waste portion as shown. Insert stack into fixture, clamp firmly using bolt and scrap pad, then cut off waste with band saw. While holding stack firmly together, place other end in jig, then clamp, and cut off remaining waste.

G.J. Barber, Verona, WI

Cutting spline grooves on short and narrow stock can be difficult. Yet it's an operation that's fairly common, especially if you make clock cases. With wide boards you can tilt the blade and run the mitered edge against the rip fence, but short and narrow stock doesn't lend itself to that technique. However, here is a jig that makes the job easy and safe. Size the jig to suit the workpiece.



Classified

The Classified rate is 75¢ per word, payable with order. Minimum ad length is 15 words, and the deadline date is the 10th of the 2nd month preceding the issue (for example, 1/10 for the March/April issue). Send copy and check to **The Woodworker's Journal**, Classified Dept., P.O. Box 1629, New Milford, CT 06776.

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Miniature Furniture Patterns. Dollhouse plans. Basswood, hinges, tools, books, wallpaper. 1" to 1' scale. Catalog $1.00. Green Door Studio, Dept. WJ, Box 6200, St. Paul, MN 55118.

Woodcraft Patterns; Windmills, Wishing Wells, Flying duck & pheasant, indoor-outdoor planters, bird houses, feeders and much more. Price list, $1.00. 11840 US 27 North, DeWitt, MI 48820.

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Woodworkers make Money when they learn from "The Woodworker's 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.

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Sconces. Series #10. Set of 10 plans and ideas: $5.00. Candleholders. Series #20. Set of 10 plans and ideas. Some lathe work: $5.00. Something Different, 1804 Old Hollow Road, Walkertown, NC 27051.

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Unusual Folding Rocker using canvas, denim, or macrame seating. Pattern $4. Leisure Seats, Box 9175WJ, Marietta, GA 30065.

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Buck Musical Instrument Products. A primary source for guitars, banjos, mandolins, violins, dulcimers, wood parts, books, records, tools, cases, etc. 150 page catalog $3.50. P.O. Box 71A, New Britain, PA 18901.

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Teak - Genuine first quality teak moldings, picture framing, furniture trim, drawer pulls, hole plugs, and round & square pads for clocks & lamp bases. Send 50¢ (refundable), for complete brochure & prices. Texas Woodworks, P.O. Box 14688, Houston, TX 77021.

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Grandfathers - Dads, too! Child's work-play-hobby bench that grows. 28" to 34" high in 2" increments. Base 18" x 35". Top ¾" ply, size your choice. Make to sell. Plan $5.00. Sobys, P.O. Box 180, Western Springs, IL 60558.

Bargains for Woodworkers. Screwhole buttons lower than ½¢, hinges 2¢, screws. Send stamp for list. Roses, 184C Winter St., Weston, MA 02193.

Unique Wood Tables. Attractive, sturdy, fold compactly. 30 x 30 x 27H, 20 x 30 x 29H, 18 x 36 x 17H, 16 x 20 x 22H. Plans, instructions (all sizes) $9.95. Skov, 3380 So. 4th Ave., Yuma, AZ 85365.

Build Furniture, Toys, Accessories and shop equipment. Select five free plans from illustrated catalog of 700 items. Send $1.00 for complete details. Maycosales, Box 2931 WJ, Mesa, AZ 85204.

Local Lumber Company - Fancy Hardwoods, white pine, custom kiln drying, flooring, paneling, 113 Canal St., Shelton, CT 06484. (203)-735-3343.

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Scrapwood Toys - 20 easy patterns; for fun, gifts or profit, send $5.95 today, Redhead Patterns, P.O. Box 39, Dept. WWJ, Hebron, CT 06248.

Woodworkers - Doll Cradle plans. Fullsized. $2.50. Great for sale or for gifts. Cradle, 20 Wamesit Ave., Saugus, MA 01906.

Router Accessory Plans - Jointer Guide for perfect glue joints. Template guide for mass producing contoured cuts. Both plans for $1.00 and 20¢ stamp. Reedy Woodworking, 1103 Royalton Dr., Vandalia, OH 45377. More plans available.

Renew Wood Furniture with Easy to Mix formulas. For recipes send $2.00 to Green Door Studio, Dept. WJ, Box 6200, St. Paul, MN 55118.

Dowels, screw hole buttons, spiral grooved dowel pins, gallery rail turnings, Shaker pegs. For price list send SASE to K & K Woodcrafters, RD 4 Box 270A, Scotia, NY 12302.

40 species of lumber for sale, green or dry. Delivery possible. Send 50¢ for listing to Irvin's Sawmill, RD 1 Box 28, Shirleysburg, PA 17260.

Swedish Door Harp Plans, a most unique project. Plans $4.95, accessory kit $5.95. Great for Christmas, other plans available, information $1.00, refundable! Custom Woodworking, RD 4 Box 4294J, Mercer, PA 16137.

Ohio Professional Woodworking Supply. For the convenience of serious woodworkers we are offering a selection of hard-to-find items, including silicon carbide abrasives, miniature abrasive discs, router cutters, fasteners, etc. Please write for our no-charge price list and literature. P.O. Box 506, Gallipolis, OH 45631.

Bandsaw Puzzle Boxes. Plans for five styles $5.95. Bennett Wood Products, Rt. 8 Box 680-S, Pensacola, FL 32506.

Childrens old fashioned Wooden Wagon. 5" wooden wheels, 9" x 17" bed. Complete detailed plans $3.00. Woodys, 821 South Logan, South Bend, IN 46615.

Plans: 19" Grandfather Style Clock. Uses regular quartz movements. Easy to construct. Excellent for Christmas gifts. $5.00, K & F Woodcraft Designs, P.O. Box 14028, Columbus, OH 43214.

Toy Plans, complete for indoor/outdoor fun. Catalog $1.00, The Toymakers, Box 3385, Stony Creek, CT 06405.

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Catalog of Unique Wooden Toy Patterns. $1.00, refundable. Playrite, Rt. 8, Box 343-J, Moultrie, GA 31768.

Wood Whirligigs. Full size patterns, instructions. 21" roadrunner, 21" coyote, 18" duck, 13" bee. $3.00 each, 4 for $10.00. Skov, 3380 So. 4th Ave., Yuma, AZ 85365.

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Shop Notes