

The Woodworker's Journal

Vol. 16, No. 2

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Shop
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- Woodthreading Devices
- Dealing with Rust

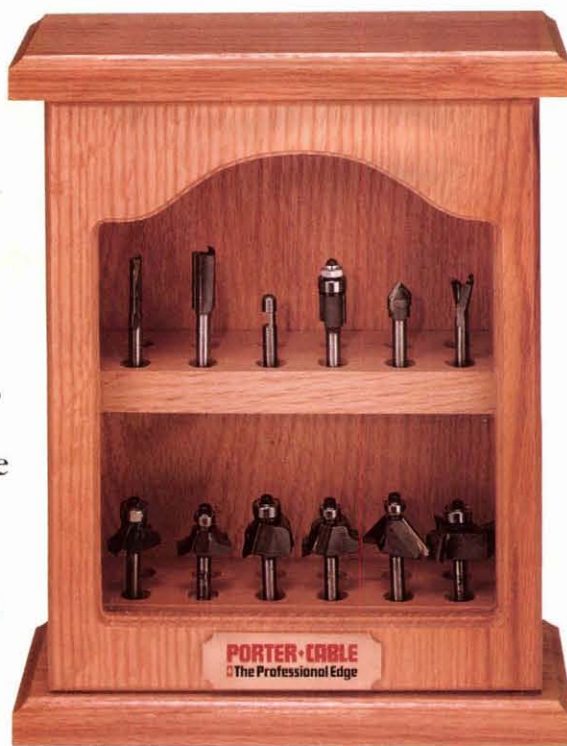
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March/April 1992

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The Woodworker's Journal

MARCH/APRIL 1992 VOLUME 16, NUMBER 2

C O N T E N T S

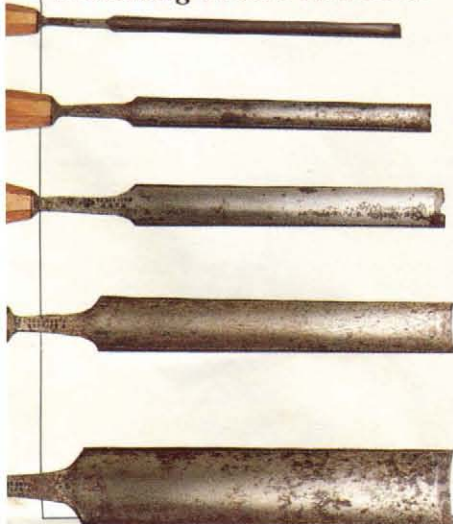
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Shoptalk

In 1964, I made a tenon cutting jig from plans by R.J. DeCristoforo. At that time, he was already a well-established woodworking authority. The jig is still in use, although in its second reincarnation. It got pretty worn by 1975, so I salvaged the handle and clamping device and built a new one. Good jigs never die.

In nearly half a century, Mr. DeCristoforo has authored some 38 woodworking books and countless magazine articles, and as a contributing editor to *The Woodworker's Journal*, he continues to spread the gospel of safe and efficient woodworking to yet another generation.

In this issue, we are pleased to present another of his fine jigs. If you've got a band saw, you'll surely want to check out the multi-purpose jig on page 30.

About a year ago, when we planned this issue, I decided to include a fishing rod rack since it's been more than 10 years since our last design. Also, I thought I'd build one for myself.

When I took count of my fishing rods, I was shocked to discover that I own no less than 25, ranging from 5 ft. casting rods to 15 ft. surf spinning rods. If this seems like an excessive number, please understand that they were purchased over a period of 30 years. It works out to be only one new rod every 1.2 years. This seems to me to be a most reasonable purchasing schedule (forget the 6 or 7 rods that were broken in car doors over the years).

The rods are stashed all over the house, in closets, on shelves, in the garage and standing in a corner of the family room. My wife has pointed out that one rod rack should be adequate for a "normal" collection (there's a not-too-subtle implication there), but we don't have enough wall space for the five or more racks needed for my rods, so why don't I just forget that project and make something we could really use like the deck rail planters, a ratchet table lamp and, for gift-giving, a bunch of those neat little salt and pepper shakers.

Subscribers' letters and surveys tell us that one of our most popular features is the Shop Tip section. In response to reader requests, and starting with this issue, we've nearly doubled the number of Shop Tips.

Although we generate many of these in our shop, we also depend on reader contributions, and we're willing to pay a handsome bounty of from \$25 to \$100 per tip. So if you've got some clever and safe ideas that will help all of us enjoy woodworking a bit more, be a bounty hunter and send them in to: Shop Tip Editor, P.O. Box 1629, New Milford, CT 06776.

James J. McQuillan

The Woodworker's Journal

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We believe that every hour spent in the shop is precious time.

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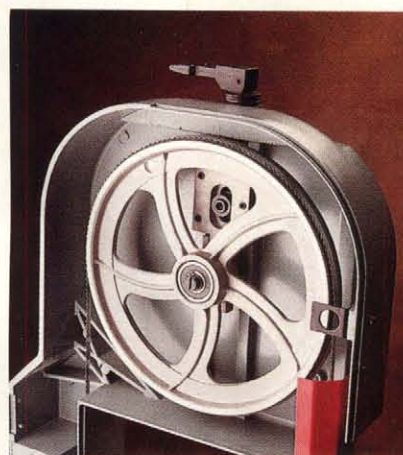
You'll find Delta quality shop tools at your local Delta machinery dealer or at leading home center and hardware stores.

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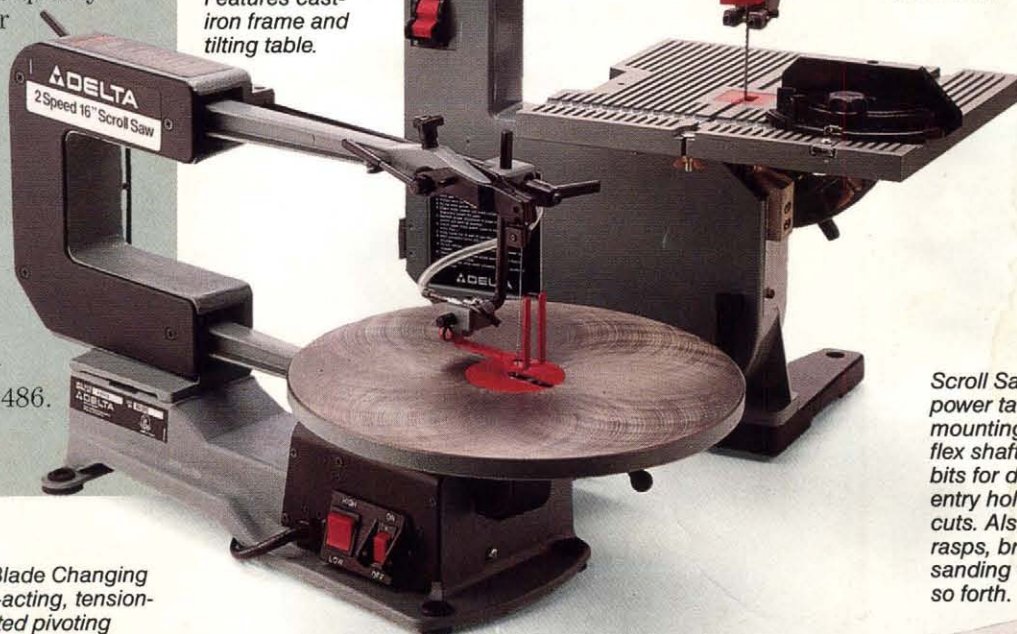
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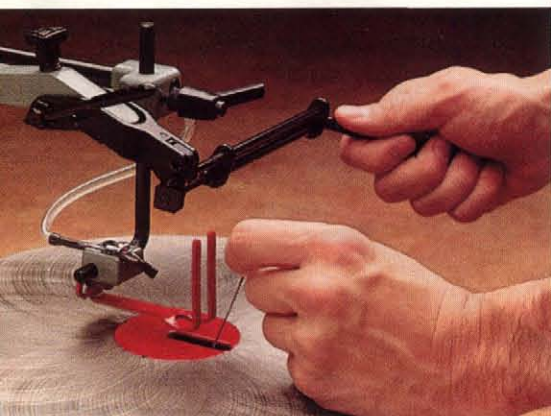


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Letters

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

Jim Barrett's review of plunge routers in your January/February 1992 issue was informative, but one point needs further explanation. The article states: "As you probably know, amps are a more accurate indicator than hp of actual power output on tools with universal (brush-type) motors." Although I've heard this before, is it really true?

Paul D. Cook, Palatine, Ill.

Jim Barrett replies: From an engineering standpoint, it would take several pages to describe exactly why this statement is accurate, but here's a brief synopsis. There are two ways to rate horsepower: maximum developed (peak) or continuous. Most router manufactur-

ers use the maximum developed rating, but some may assign a horsepower rating that falls somewhere between continuous and maximum developed horsepower. In comparing power ratings of different tools, you have no way of knowing real power, since assigning horsepower is so arbitrary. Moreover, the amperage draw at or near maximum developed horsepower is typically well over twice the rated safe amperage.

Amperage measurement, on the other hand, must be done with the same Underwriters Laboratory (UL) test procedure by all manufacturers, and companies are prohibited from listing higher than the assigned safe amperage. There's a lot more to the story than this, but I checked with engineers at several of the largest power tool manufacturers, and they confirm that amps are usually the more reliable measure.

I built the Pine Wall Cabinet featured in your September/October 1991 issue,

but have not been able to find a source for part I, the 5/16 in. magnetic catch. Where can I order these?

We were able to find them at a nearby hardware store. They are generally called button (or round) magnetic catches. If not available locally, they can be ordered from Armor Products, Box 445, East Northport, NY 11731. Order part number 75003. They currently cost \$.70 each, 10 for \$5.50. Add \$3.00 shipping for orders up to \$15.

After dispensing medications for headaches, heartaches and hemorrhoids all day, I find *The Woodworker's Journal* a welcome relief.

P.J. Gillis, Ken's Pharmacy,
Manchester, N.H.

Odds and Ends

In the Letters section of our January/February 1992 issue, we said that the mail-order company, Woodworker's

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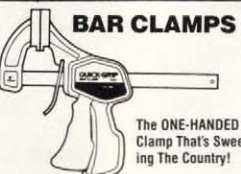
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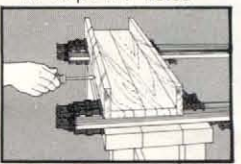
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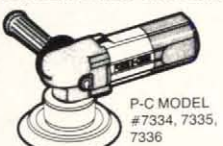


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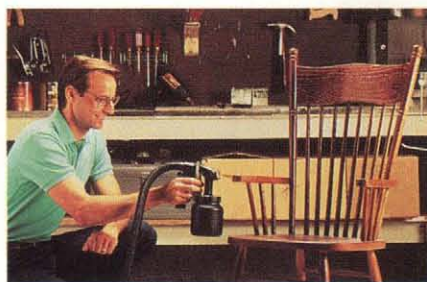
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Dream of Nazareth, Penn. sold 1/8 in. thick oak, ash, cherry and walnut. However, we have recently been advised that they no longer carry this material.

Craftsman Wood Service, 1735 West Cortland Ct., Addison, IL 60101, sells 1/8 in. thick stock in oak, cherry and walnut, but not in ash. They also carry 1/8 in. maple, balsa wood, basswood, aromatic red cedar, maple, poplar, spruce, and a variety of imported woods.

Merle Levy, of MLCS, tells us that in addition to carrying the spiral end mill cutters, locking drawer joint bits, spiral bits, and pattern cutting bits featured in the "In The Shop" article in our January/February 1992 issue, they also offer an inexpensive starter kit for doing biscuit joinery with your router. The kit includes a 5/32 in. slotting cutter plus a supply of the no. 20 biscuits. Cost is \$29. Contact MLCS at 1-800-533-9298.

The Michigan Woodworker's Guild is an association of 260 professional and

amateur woodworkers dedicated to improving the understanding and quality of woodworking for each of its members. For membership information write to the Michigan Woodworker's Guild, c/o Robert Bonetti, 619 Elizabeth, Rochester, MI 48307.

The National Arbor Day Foundation, a nonprofit educational organization dedicated to tree planting and conservation, is giving away 10 free Colorado Blue Spruce trees to each person who joins the Foundation. In Southern and West Coast states, other conifers hardy in those areas will be provided. The free trees are part of the Foundation's "Trees For America" program. The 6-12 in. trees are guaranteed to grow, or they will be replaced free of charge. To become a member of the Foundation and to receive the free trees, send a \$10 membership contribution to: Ten Blue Spruces, National Arbor Day Foundation, 100 Arbor Ave., Nebraska City, NE 68410.

Your safety is important to us . . .

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

— The Editors

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610 CFM Dust Collector:

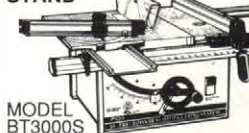
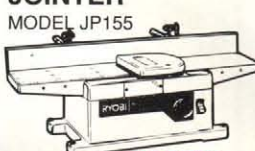
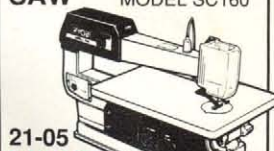
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21-31	1323ALSK	Long Shoe Planer	127
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21-34	S45	1/3 Sheet Sander	59

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21-35	1605	Biscuit Joiner	\$129
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21-37	7484	Random Orbit Sander	99

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21-41	6402	3/8" VSR Drill 5.2 amp	97
21-42	4200N	4 3/8" Circular Saw	129
21-43	LS1011	10" Slide Compound Miter	439
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21-45	1900BW	3 1/4" Planer	112
21-46	9401	4" x 24" Belt Sander	173
21-47	9924DB	3" x 24" Belt Sander	153

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Events

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

California: The Sacramento Woodworking Show, Apr. 3–5, Community Convention Center, Exhibit Hall A, Sacramento. For information call 1-800-826-8257.

The Ventura/Santa Barbara Woodworking Show, Apr. 10–12, Ventura County Fairgrounds, Commercial Building, Ventura. For information call 1-800-826-8257.

The Northern California Woodworking Show, Apr. 24–26, San Jose Civic Auditorium, Exhibit Hall, San Jose. For information call 1-800-826-8257.

The San Bernardino Woodworking Show, May 1–3, Maruko Convention Center, San Bernardino. For information call 1-800-826-8257.

Connecticut: For information on classes and weekend seminars at the Brookfield Craft Center, call (203) 775-

4526 or write to the center at P.O. Box 122, Brookfield, CT 06804.

Florida: The Central Florida Woodworking Show, Mar. 6–8, Florida State Fairgrounds, Tampa. For information call 1-800-826-8257.

The South Florida Woodworking Show, Mar. 13–15, War Memorial Auditorium, Fort Lauderdale. For information call 1-800-826-8257.

Georgia: ACC Craft Fair, "A Salute to American Craft," Atlanta Apparel Mart, Atlanta, Apr. 23–26. For fair information contact American Craft Enterprises 1-800-836-3470.

The Atlanta Woodworking Show, Mar. 20–22, Lakewood Fairgrounds, Building 1, Atlanta. For information call 1-800-826-8257.

Illinois: The Chicagoland Woodworking Show, Mar. 27–29, Odeum, South

Hall, Villa Park. For information call 1-800-826-8257.

Indiana: Woodworking World—The Fort Wayne Show, Mar. 27–29, Allen County War Memorial, Fort Wayne. For information call 1-800-521-7623.

Kentucky: Woodturning and joinery workshops. Contact Jim Hall, Adventure in Woods, 415 Center St., Berea, KY 40403; tel. (606) 986-8083.

Maine: Woodworking World—The Portland Show, May 1–3, Portland Exposition Center, Portland. For information call 1-800-521-7623.

Maryland: Woodworking World—The Baltimore Show, Apr. 24–26, Towson State University, Towson Center. For information call 1-800-521-7623.

Michigan: Woodworking World—The Detroit Show, Apr. 10–12, Michigan (continued on page 12)



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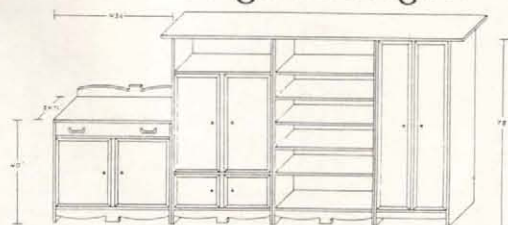
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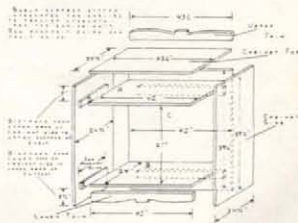
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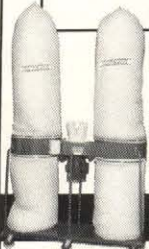


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Events

Continued

Exposition and Fairgrounds, Detroit. For information call 1-800-521-7623.

New Mexico: Woodworking World—The Albuquerque Show, Mar. 13–15, New Mexico State Fairgrounds, Albuquerque. For information call 1-800-521-7623.

New York: Woodturning Symposium conducted by Ernie Conover, Mar. 6–7; 4th Annual Wood and Tool Expo, Mar. 21–22; The Winter-Spring 1992 Classes in Woodworking at Constantine's run through April. For detailed information, call (212) 792-1600 or write Constantine's 2050 Eastchester Rd., Bronx, NY 10461.

Woodworking World—The Buffalo Show, Apr. 3–5, Erie County Fairgrounds, Hamburg. For information call 1-800-521-7623.

North Carolina: Among the Penland School's Summer 1992 Workshops is Furniture Making with Tage Frid, June 1–12. For information on this and other

workshops, contact Penland School, Penland, NC 28765; tel. (704) 765-2359.

Country Workshops is offering workshops on Ladderback and Windsor Chairmaking. For information call (704) 656-2280 or write Country Workshops, 90 Mill Creek Road, Marshall, NC 28753.

Ohio: Wood Finishing Techniques, Earl Richards, Instructor, is being held Mar. 28 and is sponsored by The Hardwood Store, 1813 Dalton Dr., New Carlisle; tel. (513) 849-9174.

A workshop in Finishes, sponsored by Carriage Hill Farm, will be held Mar. 7. For information call (513) 879-0461.

Oregon: Workshops at the Oregon School of Arts and Crafts include An Introduction to Bowl Turning, Mar. 1; Sculptural Marquetry, Mar. 8. For information, call (503) 297-5544.

Tennessee: For information on workshops at the Arrowmont School of Arts and Crafts, write to the Registrar, Ar-

rowmont School, P.O. Box 567, Gatlinburg, TN 37738; tel. (615) 436-5860.

Woodworking World—The Johnson City Show, Mar. 20–22, Freedom Hall Civic Center, Johnson City. For information call 1-800-521-7623.

Texas: Woodworking World—The Houston Show, Mar. 6–8, Pasadena Convention Center, Pasadena. For information call 1-800-521-7623.

Vermont: The Vermont State Craft Center at Frog Hollow will be hosting a Shaker Conference Mar. 6. June Sprigg, Curator of Collections, Hancock Shaker Village, will be the keynote speaker. Hands-on workshops will be conducted Mar. 7–8. For more information or to register call (802) 388-3177.

Wisconsin: Furniture Restoration Workshop—Comprehensive 2-day workshop covers complete restoration process. Contact the Minuteman Institute, 115 N. Monroe St., Waterloo, WI 53594; tel. (414) 478-2001. 

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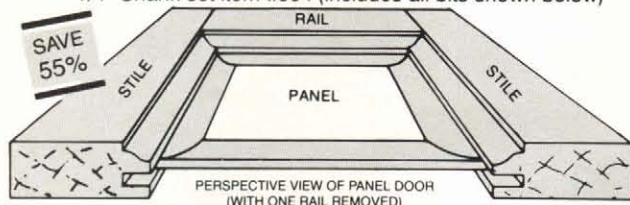
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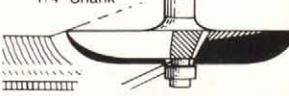
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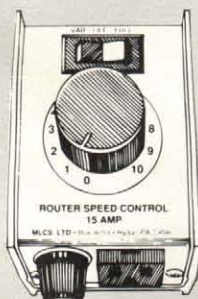


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#353		5/16" Round Over	5/16" R	1 1/8"	1/2"	1/4"	\$14.00
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#207		1/2" Cove	1/2" R	1 1/2"	5/8"	1/4"	\$14.00
#643		1/2" Cove	1/2" R	1 1/2"	5/8"	1/2"	\$15.00
#208		3/4" Cove	3/4" R	1 7/8"	3/4"	1/2"	\$26.00
#231		5/32" Roman Ogee	5/32" R	1 1/4"	1 5/32"	1/4"	\$16.00
#232		1/4" Roman Ogee	1/4" R	1 1/2"	3/4"	1/4"	\$17.00
#506		1/2" Pattern	Flush Trim	1/2"	1"	1/4"	\$15.00
#508		3/4" Pattern	Flush Trim	3/4"	1"	1/4"	\$17.00
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#546		Tongue & Groove	Wedge	1 3/16"	1"	1/4"	\$29.00
#846		Tongue & Groove	Wedge	1 5/8"	1"	1/2"	\$29.00
#450		1/8" Beading	1/8" R	3/4"	3/8"	1/4"	\$11.00
#233		1/4" Beading	1/4" R	1"	1/2"	1/4"	\$13.00
#454		3/8" Beading	3/8" R	1 1/4"	5/8"	1/4"	\$15.50
#455		1/2" Beading	1/2" R	1 1/2"	3/4"	1/4"	\$17.00
#500		3/8" Flush	Trimming	3/8"	1/2"	1/4"	\$ 7.00
#501		3/8" Flush	Trimming	3/8"	1"	1/4"	\$ 7.50
#503		1/2" Flush	Trimming	1/2"	1"	1/4"	\$ 8.50
#221		1/2" Flush	Trimming	1/2"	1 3/16"	1/2"	\$ 8.00
#558		Thumb nail		1 3/16"	3/8"	1/4"	\$18.50
#858		Thumb nail		2 1/2"	3/4"	1/2"	\$35.00
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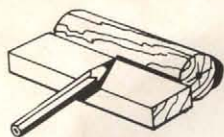
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Shop Tips

Beeswax makes an ideal lubricant for woodscrew threads, but it's not always easy to find. Next time you're in need of some, check with your local fabric or sewing notions store. Most carry small beeswax disks (sewers use it to coat fabric thread) which sell for about \$1.

When working on a carving project, and using my V-gouge to make light cuts, I like to hold the gouge like a pencil and push it through the wood with my fingertips. To make the tool more comfortable to hold when making this type



of cut, I find it helpful to wrap heavy string around part of the shaft of the blade. I learned this trick while visiting some woodcarvers in Switzerland and it really works.

Rick Butz, Blue Mountain Lake, N.Y.

I recently discovered that my stick of abrasive belt cleaner works great for removing pencil marks on wood. Use it like an eraser and the marks come off quickly and effortlessly.

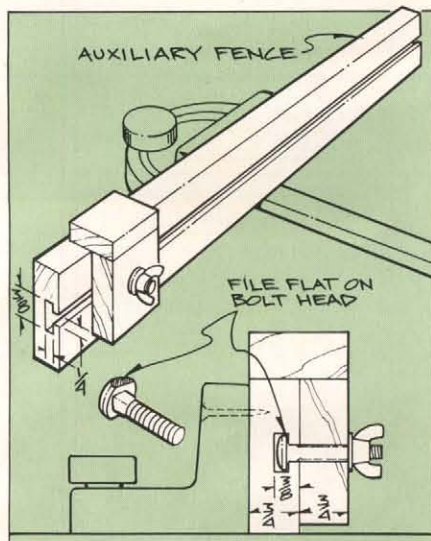
Steven R. Tremaine, Rochester, N.Y.

For filling holes with wood putty, I find nothing works better than an artist's palette knife. The small handle and thin trowel-shaped blade enable you to fill a hole with one clean swipe, leaving little or no clean-up work. You can get a palette knife at most any art supply store for \$4 to \$5.

Sven Hanson, Albuquerque, N. Mex.

Over the years, we've come across many methods for making adjustable miter gauge stops, but none have been as simple and effective as this one.

Using a keyhole router bit (sold by most mail-order catalogs) that cuts a $\frac{3}{8}$



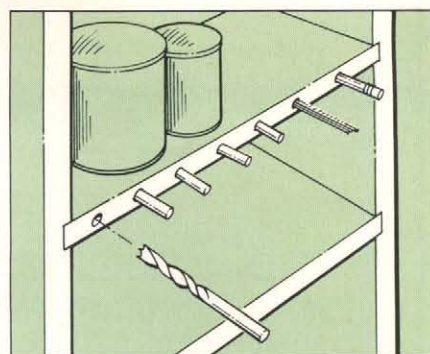
in. entry hole and a $\frac{1}{4}$ in. slot, route a groove down the center of an auxiliary wood fence. The keyhole bit will be less likely to burn if you first remove most of the material using a $\frac{1}{4}$ in. straight cutter. You'll need about a $\frac{3}{8}$ in. depth, so make three cuts with the straight cutter, each one removing $\frac{1}{8}$ in. of stock.

Cut a stopblock to size and bore a $\frac{3}{16}$ in. diameter hole through the center. Note that the stopblock is about $\frac{1}{8}$ in. narrower than the fence in order to allow for sawdust clearance.

A $\frac{3}{16}$ in. diameter by $1\frac{1}{4}$ in. long carriage bolt serves as a clamp, but you'll first need to file a pair of flats on opposite sides of the bolt head so that it can fit in the $\frac{3}{8}$ in. groove. Assemble the stopblock, carriage bolt, washer and wing nut as shown. A top glued to the stopblock helps keep the stopblock square to the saw table. Finally, add a thin coat of paste wax to help everything slide easily.

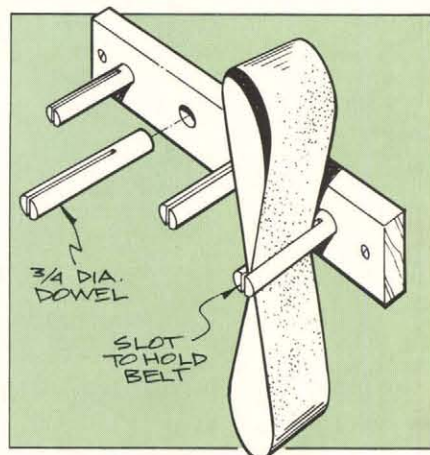
When cutting veneers with a utility knife and straightedge, always place the straightedge over the material you want to keep. Should the knife stray, it will only cut into the waste.

Roger Holmes, Woodbury, Conn.



A few holes bored in the front edge of a shelf creates a handy place for storing drill bits, scroll saw blades, pens, pencils and the like.

This easy-to-make rack makes a perfect way to organize and store sanding belts. To make it, cut $\frac{3}{4}$ in. diameter dowel stock to a convenient length, then



use a hand saw to slot each one. A panel saw, which cuts a wide kerf, is probably your best choice here. Glue the pegs to a $\frac{3}{4}$ in. thick by 4 in. wide board and secure the board to your shop wall.

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

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

"MY WOODWORKING SHOP MAKES ME \$300 WEEKLY, PART TIME. YOURS CAN, TOO!"

You've heard of "the woodworker who was a real butcher." It's true for many years I was a meat cutter in a butcher shop in Erie, Pennsylvania. But several years ago the poor economy in the Erie area forced me to look for a new job.

I looked for months. Nothing was available. My situation was so bad we were getting calls from collection agencies. Each time the phone rang my wife would begin to cry.

I was sitting at the kitchen table very late one snowy night in December. I couldn't sleep, my checkbook was overdrawn, bills were piling up and the bank was threatening to foreclose on our home.

While I was sitting there, I began remembering the advice a very successful man by the name of Ed from Waterford, Pennsylvania once gave me. He said, "Rick, If you want to succeed, make a living, don't just earn a living. In other words, work for yourself, BE YOUR OWN BOSS." This man should know! He was 89 years old and a self-made millionaire.

"Make a living?" That night it came to me. For years my wife, Amy, and I went to all the local craft shows. We loved them. We admired the beautiful handmade woodcrafts. Fact is, I've enjoyed woodworking ever since I was a boy. I told Amy many times, "When I retire and have more time I want to make handmade wooden toys and gifts."

It was just before Christmas and there were many local craft shows, so we started going to each of them. We watched what items were selling well and asked a lot of questions. After gathering all the information we could, we went to work.

In an abandoned pigeon coop with an old borrowed saw and some scrap lumber, we designed seven very unusual items, among others, which we thought would have great sales appeal. After cutting each on our old band saw, hand sanding them smooth and painting them in many colors, we loaded them into our old Chevy station wagon and went to our first craft show in Waterford, Pennsylvania.

We were so excited we arrived an hour earlier than the rest of the crafters to make sure we were ready before the show started.

Amy and I sat in our booth anxiously watching the people look at our hand-made woodcrafts. A well dressed lady in a red dress picked up one of our blue cat doorstops and said, "Oh, how cute. This is just what I've been looking for." Our first sale, \$9.95. That was just the start. Next we sold one of our Canadian geese items for \$5.95, then two unique toy trucks to an elderly lady who wanted to give them to her grandson.

At the end of the day we looked into our cash box. We'd made over \$600!

We were so happy we treated ourselves to a prime rib dinner for the first time in fourteen months!

We have some friends, Bob and Nancy Williams, from Fairview, Pennsylvania. Bob is a 25-year-old school teacher, so of course they needed an extra income to help with the family expenses. Bob asked me if I would help them get started with a money making woodworking business.

Amy and I spent several weeks helping them turn their garage into a workshop. We gave them many designs which were very profitable for us, and information on which shows to attend.

Now, eighteen months later, they have a very successful craft business attending shows in the summer months when Bob isn't teaching. Nancy keeps the business going in the winter attending the local Christmas shows and filling mail orders.

This isn't some kind of "Get Rich Quick" deal. No way. There's plenty of room for everyone in crafting. I won't be competing with you and you won't be competing with me. That's why Amy and I would enjoy showing you how you can start your own craft business using your basic woodworking and painting skills. You can go as far as you want... profits are virtually unlimited!

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New Product Review

I had the opportunity to try out the Performax S/T sander along with the Performax power feed assembly. The Performax S/T is a wide-drum surface/thickness sander attachment for your radial-arm saw. With enough ingenuity and attachments, a radial-arm saw can do just about anything, but I was somewhat skeptical that a clamp-on attachment could turn it into a capable wide-surfacing sander. After working with the Performax, I find that my doubts were misplaced.

The Sander

The Performax S/T has a 22 in. wide x 5 in. diameter sanding drum with a support arm that clamps to the column of your saw. A pulley is provided to mount on the arbor in place of the blade. The saw arm and motor support yolk are positioned so that the motor pulley and drum pulley align and provide sufficient tension for the drive V-belt. A molded plastic cover fits around the drum and provides the dust collection hook-up.

Although the drum is 22 in. wide, the open sided (cantilevered) design allows wide stock up to 44 in. to be finished in two passes.

Power Feeder

The power feeder attaches to the top of the saw table and allows infinitely variable feed rates of between 0 and 10 feet per minute. The conveyor belt is a thin, tough Mylar-like plastic film coated with 120-grit abrasive. This combination provides a very good grip on the stock and does not compress, thus allowing precise thicknessing. The reinforced steel conveyor bed provides a rigid platen against which the stock can be accurately surfaced. The motor is directly coupled to the rubber covered steel drive roller.

Assembly

The sander and power feeder require some assembly but the instructions are clear and all the necessary hardware is provided. You will need the usual assortment of wrenches and hex keys. My assembly time was a little over a half hour for each unit. Mounting the sander and feeder on the radial-arm saw took less than 10 minutes.

How It Worked

The 3 in. wide by 10 ft. long cloth backed abrasive strip is spirally wrapped around the drum and fastened with built in spring clips. One of the clips has a provision to take up the slack as the sander is used. The wrapping was easy but it was a bit of a squeeze to get my fingers onto the spring clips at the ends.

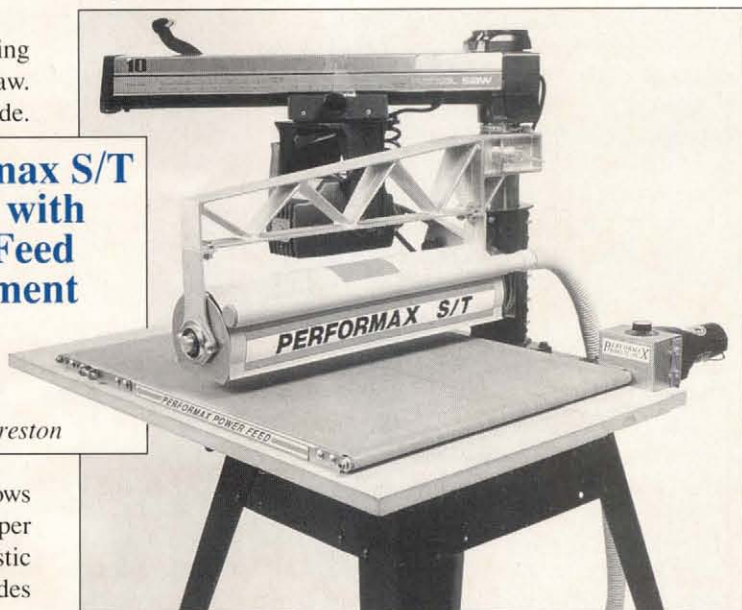
I sanded oak, walnut and cherry boards during the test to check the quality of finish as well as the ability to "grind off" wood. The sanded surface was very uniform with no ripples or gouging. I attribute part of this to the steady feed of the power feeder. The ripples left by a surface planer could be removed in one pass with 80-grit abrasive. The sander produced good crisp edges with no round over—an important consideration if you are preparing stock for glue-up.

The unit is described as a sander and a thicknesser and it will do both tasks, however the depth of cut and feed rate are dependent on the motor power of your saw. The work is best done by taking light passes. Heavy thicknessing passes on wide stock requires considerable horsepower.

The variable speed direct drive gear motor provides the power to drive the conveyor. Feed rate can be varied between 0 and 10 feet per minute. The small 1/30 hp DC motor has a surprising amount of torque and did an excellent job driving the

Performax S/T Sander with Power Feed Attachment

by Dennis Preston



stock through the sander. The feeder unit has a very simple screw and nut adjustment for belt tension and tracking. I found these adjustments to be simple and effective and had no problems with belt tracking.

The sander comes with a cover that provides the dust pick-up. It's absolutely necessary to use a shop vacuum or dust collector when sanding. Clouds of dust sail off the drum. Even if you were willing to put up with the housekeeping problems and wear double dust masks, the conveyor belt quickly fills with dust causing the stock to slip.

Summary

My overall impression is very favorable. The Performax S/T gives the small shop some large shop sanding/surfacing capability without a major investment in additional machinery and floor space. You can hand feed the stock through the sander but the power feeder does such a nice job and is so convenient you'll get spoiled.

If you don't have a radial-arm saw, if you prefer a freestanding unit, or if your work requires a lot of heavy stock removal, Performax offers their Pro Stand which uses this sander and feeder and allows the use of a larger motor.

Prices are \$300 for the Performax S/T, \$330 for the power feed, and \$350 for the optional Pro Stand. The heavy-duty motor is \$225. For more information, contact Performax Products, Inc., 12211 Woodlake Drive, Burnsville, MN 55337; tel. (612) 895-9922.



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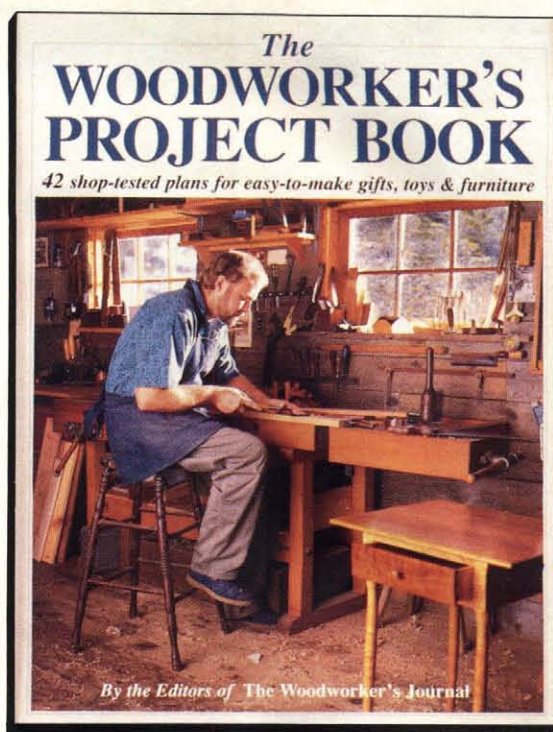
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Readers' Information Exchange

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

I need an owner's manual and parts list for a Shopsmith Mark V Anniversary Edition, made by Yuba Power Products in about 1970.

Jim Mau

1453 W. Juanita Ave., Mesa, AZ 85202

I'm looking for an owner's manual or information for a Sears Craftsman Router Crafter, model no. 720.25250.

James M. Baumann

6906 Balchen Dr., Edwards, CA 93523

I received a hand-me-down wood lathe. The only identification on it is:

Companion 11013 103, model no. 103.0601. It has no center spur, only a 1/2 shaft sticking out of the head. I need a source to buy a center spur.

Albert Keul

RD #2 Box 4470

Ellwood City, PA 16117

I need an owner's manual for a Sears 12 in. metal lathe, model no. 101.07383.

James Andrews

6010 S 020 W, Wolcottville, IN 46795

I need a jointer fence, part no. 29424, for my Craftsman jointer, model no. 103.23340. I'm also looking for a morse taper for an Atlas lathe tail stock, model no. 7122, serial no. 004802.

Dick Eddy

45 William Fairfield Drive

Wenham, MA 01984

I need a 1/2 in. collet and parts list for a Duracraft shaper, model no. 31111.

Ed Chonko

436 Highmeadow Road

Amherst, OH 44001

I have a 10 in. table saw, model no. NB1025, made by Sprunger Corp., Elkhart, Indiana. I need a height adjust lead screw and lead nut. Is anyone selling parts for Sprunger tools?

Richard S. Meissner

3234 N.E. 48th, Portland, OR 97213

I have an RBI Hawk 220 scroll saw which is in a room with a wooden floor. The vibration in the saw is so bad that it makes cutting difficult. I spoke to the manufacturer and they blamed it on the floor, and suggested that I temporarily move the saw to a location with a more solid floor to see if that made a difference. Sure enough, the vibration was almost eliminated. Unfortunately, I have to use the saw in the area with the wooden floor and I was wondering if anyone might have some ideas on how I can reduce the vibration.

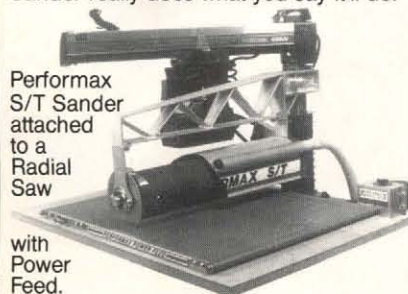
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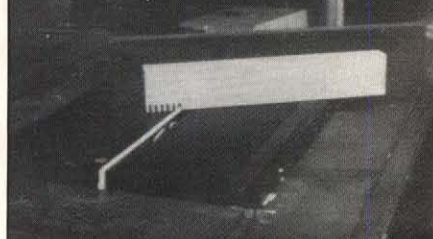
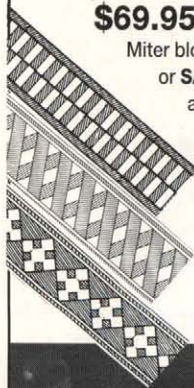
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Rust Busters

Who do you call to reclaim and protect tools from rust?

by Roger Holmes

I'm a sucker for secondhand tools. Years of scrounging at "antique" markets and scouring classified ads have rewarded me with a shop full of quality tools bought for a fraction of what they would have cost new. Of course, cash savings have often been balanced by the time and sweat required to put my prizes in working order. For the most part, I enjoy the process of bringing a neglected tool back up to snuff, whether it's realigning the tables on a jointer the size of an aircraft carrier or fiddling with the frog of an old Stanley #7 plane.

The one reconditioning task I loathe is, naturally, the most common—rust removal. A rust-free second-hand tool is a rare find. Most have at least a spot of the stuff here and there; sometimes entire surfaces sport a thin reddish-brown coat the texture of fine sandpaper. The truly neglected, located just this side of the scrap heap, present moonscapes of scaly, pitted iron and steel.

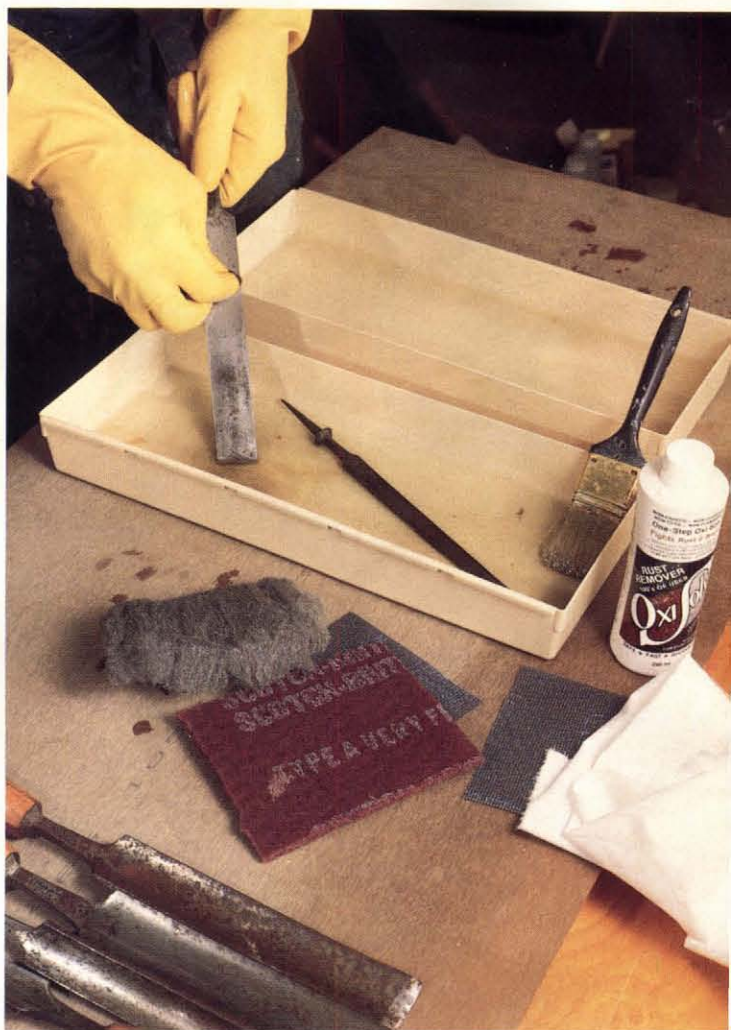
For years, I have attacked rust with abrasives and elbow grease. Steel wool or Scotch-Brite pads handle minor infestations. More entrenched cases warrant sandpaper, emery cloth or drywall sanding screens. (With rare exceptions, I have left the scaly, pitted specimens for those more optimistic than I.) The results are usually worthwhile, but the work is tedious and dusty.

Rust, of course, isn't just a reconditioner's problem. Old tools, new tools, anything with an unprotected metal surface is at risk. The humidity rises or the temperature changes, depositing a film of moisture on a chisel's tool-steel blade or a jointer's machined cast-iron tables and, bang, it's back to the steel wool. Protecting tools from rust, particularly if your shop occupies a damp basement or garage, is a daily concern.

Fortunately, there are some products that reduce the work of rust removal and ease the burden of rust prevention. I tried some of these recently and, while my examinations were by no means scientifically rigorous, I came away feeling my days of snorting rust dust are over.

What Is Rust?

First, a little chemistry. All steels, from cast iron to high-speed tool steel, are alloys of iron (chemical symbol Fe) with much smaller quantities of other elements; usually carbon but sometimes more exotic substances. (High-speed steels, for example, can be alloys of iron and tungsten, chromium, cobalt and/or vanadium.) Iron is less stable in these compounds than



in its "natural" forms, the iron oxides and other compounds mined from the earth. In the presence of water and oxygen, the iron in steel happily reverts to nature, so to speak, forming ferric hydroxide ($\text{Fe}_2\text{O}_3 \cdot \text{H}_2\text{O}$), the brownish-red deposit we ordinary folks call rust.

Most metals corrode, but some, copper and bronze for example, gain from the initial deposits a measure of protection from further corrosion. Alas, this is not as true of iron and steel. As all car owners know, a little rust begets more rust until, if left unchecked, the steel disappears altogether.

Getting Rid of Rust

There are two ways of dealing with rust. You can rub, scrape, grind or sandblast it away, exposing new metal. Or you can attack it chemically, breaking down the ferric oxide. The preparations I tried do the latter, and I helped them along with some energetic scrubbing.

I came across OxiSolv Rust Remover, a clear liquid the consistency of water, in a mail-order woodworking catalog. A trip to the local hardware store turned up Naval Jelly, a viscous pink liquid that appears to be a sort of Pepto-Bismol for distressed steel. My neighbor, a veteran of numerous battles with rust-infested automobiles, suggested I try PPG Metal Cleaner DX 579, a blue, watery liquid available at a local auto supply.

Phosphoric acid is the main rust remover in all three products. In addition, OxiSolv simultaneously deposits a protective layer of zinc phosphate; a companion product to DX 579, Metal Conditioner DX 520 SG (who thinks up these names?) does the same when applied separately. (I'll discuss protective measures later.)

Working outside on a plastic-covered table, my hands sheathed in ordinary, kitchen-strength latex gloves, my eyes protected from splashes by goggles, I swabbed on the liquids with old paint brushes. The tools were a mixed lot: a selection of turning chisels afflicted with a thin, uniform coating of rust and, the real challenge, a scaled and pitted two-man timber saw.

All three solutions made short work of the chisels. A couple minutes after the surfaces were coated, they scrubbed almost clean with a Scotch-Brite pad. One or two more coatings and scrubbing eliminated most of the recalcitrant spots. In all cases the clean steel had taken on a slightly dull, light-gray cast—like a worn nickel.

The saw, however, posed a stiffer challenge. Swab, wait and scrub; swab, wait and scrub—over and over I repeated the same ritual, leaving the solutions to work from 3 to 10 minutes or so before scrubbing and reapplying. (You're not supposed to let these products dry out on the surface.) The results were varied. Naval Jelly and OxiSolv produced a patchwork—some areas appeared to be steel speckled with rust; others were rust speckled with steel. DX 579, which is a more concentrated acid, worked faster. In a half dozen swab-and-scrub cycles, I'd uncovered an impressive patch of steel.

Pleased with my first efforts, but feeling the need to know more, I phoned the manufacturers. The people with whom I spoke were helpful and patient, but chemical reactions are complicated processes and I soon realized I wasn't going to unravel the chemistry of rust removal, or the relative merits of the products, in an afternoon. Still, I learned some interesting things and received some useful tips.

I discovered something of the history of these products when I spoke with Hal Kaufman, recently retired founder of

Before Treatment



After Treatment



the Naval Jelly Company in Kansas City, Missouri. About 25 years ago, repeated requests for help from people who wanted to remove rust on household items intrigued Kaufman, owner of a mail-order business and possessor of an undergraduate chemistry degree. Industry removes rust in vats of concentrated acids, but Kaufman reasoned that a safely diluted, easy-to-use rust-remover might find a market. Viscous paint removers, thick liquids that can be brushed on and adhere to vertical or overhead surfaces, seemed a good model, but Kaufman knew that gel structures don't stand up in acid. When he figured how to make a viscous, non-gel solution of phosphoric acid, Naval Jelly, and a new consumer industry, was born.

For insight into the acid-rust reaction, I turned to Tom Specht, a technical representative for refinish coatings at PPG, makers of DX 579. With generous allowance for the considerable holes in my chemical knowledge, Specht explained that, essentially, the acid strips the oxygen from the ferric oxide, leaving iron ions, most of which are rinsed away. Some of the remaining iron is deposited on the surface as iron phosphate, which is responsible for the slightly cloudy grayish-white appearance.

Lee Junge, plants operations manager for Solv-O, manufacturers of OxiSolv Rust Remover, furthered my education by pointing out that every 15°F increase above room temperature doubles the speed of OxiSolv's acid-rust reaction. Junge said he'd removed as much as 1 in. of rust from parts soaked in vats of OxiSolv heated to 100°F. He also cautioned me to disassemble moving parts before treating them with OxiSolv, otherwise the zinc coating will seize up the parts. (Another Solv-O product, OxiSolv Degreaser/Rust Remover lacks a coating and can be used for parts that can't be disassembled or where no coating is desired.)

Armed with this information, I submerged a collection of badly rusted washers, wrenches and plane irons in shallow plastic trays filled with OxiSolv Rust Remover and DX 579 and left them overnight. The next day a little scrubbing revealed virtually rust-free surfaces.

Rust Removal: A Wrap Up

As you can see, I'm no expert at rust removal, but here's a summary of what I've learned.

Minor to moderate rust: For rust that doesn't require a good soak to eradicate, all three products worked well. If the item is small enough to turn and position horizontally, I found the watery OxiSolv Rust Remover and DX 579 easier to work with than the viscous Naval Jelly. If the surface is angled or overhead and immovable, Naval Jelly may be the best bet.

Despite the ease of using rust removers, I'm not throwing away my steel wool. I'm not fussy about most tools, but I do like my chisels to shine. Because all three products slightly dull treated surfaces, I'll stick with steel wool to remove the light rust that often blossoms overnight.

Major corrosion: Soaking in OxiSolv or DX 579 is the way

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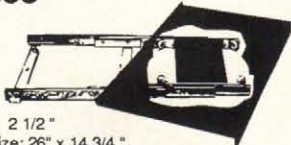
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to go. Larger items require more solution and bigger containers, but both solutions can be reused if they're freshened up periodically. (OxiSolv recommends adding 10 percent new solution when reusing.) Just be sure to store these materials in plastic containers; they will eat through ferrous metals given enough time.

If the item is too large to soak, there seem to be few alternatives to a long bout of swabbing and abrasive scrubbing. Sand blasting is useful if you're not worried about damaging a machined surface. If you just want to arrest rust damage on a machine base or other non-work surface, you might try products that stabilize but don't remove rust. Auto body suppliers sell several; D-Rust/7, which is advertised in woodworking catalogs, is another.

Protecting from Rust

Defense, my high school basketball coach used to admonish us, is often the best offense. You wouldn't have to soak, swab or scrub if you prevented rust in the first place. A simple method for small tools is to enclose them in a box with a few sheets of rust preventative paper.

Another common way to prevent corrosion is to erect a barrier between the surface of the steel and the moisture necessary for oxidation. Paint works well, but isn't appropriate for many of the tools in a shop—plane irons, chisels, saw and jointer tables. Oils, waxes and silicone-based products lubricate as well as protect, but some stain wood or interfere with wood finishes.

A search of woodworking catalogs yielded several products that claim to produce non-staining, rust-inhibiting coatings. Top-Cote and Dyna Glide Woodworking and Tool Dry Lubricant and Cleaner are both sprays, though of what isn't clear. Top-Cote mentions "synthetic materials," Dyna Glide talks of "extreme pressure waxes." A third product, Kurobara Camellia Oil, evokes the mystique of the Japanese craftsman. It is expensive—3 oz. cost \$13 to \$17, depending on the supplier—but I know a woodworker who swears by the stuff, and points out that a little goes a long way.

One more spray-applied rust preventive is Boeshield T-9. Peter Schwarz, President of PMS Products, the company that makes Boeshield, explained that Boeshield is mainly a paraffin wax in a solvent vehicle. "Once the solvent vehicle evaporates, the remaining film is a dry paraffin wax which will not stain wood," Schwarz said. Application calls for spraying on and then wiping off. "For long-term storage of equipment in a damp basement or garage, spray on but do not wipe off," Schwarz advised. "That way you get maximum protection, good for about 12 months. When you're ready to use the equipment, simply respray and wipe off," Schwarz added.

Still another product, RD90, provides metal protection from rust, but should only be used on surfaces that don't come into contact with wood, since it has a mineral oil base and doesn't claim to be non-staining.



Another method of rust protection is offered by OxiSolv Rust Remover and PPG Metal Conditioner DX 520 SG, both of which deposit a thin layer of zinc phosphate on the steel. This crystalline film forms a physical barrier to water, but more important, it provides electrochemical protection. When water rests on a metal surface, it becomes an electrolyte, just like in a car battery, hastening the oxidation of the metal. Zinc is more susceptible to this process (called galvanic corrosion) than steel, therefore the layer of zinc corrodes before the steel. As long as a "sacrificial" layer of zinc remains, the steel is safe.

You can apply a zinc coating with OxiSolv Rust Remover or DX 520 SG to any tool, new, old or newly de-rusted. It's prudent to use a degreaser beforehand, as even the oils secreted by your hands can interfere with the process. When the zinc wears away, just recoat the tool.

Safety

Any product that can eat its way through a layer of rust ought to raise some concern about what it might do to skin, eyes or lungs. But chemicals have become so pervasive in our lives (just look under your sink, in your garden shed or on your

workshop shelves), and we're so grateful for or impressed with what they do, that we too often overlook their hazards.

I wasn't too worried about Naval Jelly and OxiSolv, which are sold for home use. And, when my friend sang the praises of PPG's DX 579, I just glanced at the bottle before trying it out. Sure, the label said it was "designed for application by trained personnel" and called for goggles, impermeable clothing and "ADEQUATE VENTILATION." But, I reasoned, the professional stuff is often the good stuff; besides, my friend said he just tossed parts in a plastic bucket of solution in a corner of the garage and let them soak. So, I went to work, outdoors with my goggles and gloves, and DX 579 seemed no more troublesome than the other two products—and it worked great.

That's where the story usually ends for me and, I suspect, for many others. Task accomplished, no casualties, new "magic" chemical put up on the shelf ready for the problem. But, for the sake of this article, I felt obliged to poke further. I read the product labels more carefully and I requested the Material Safety Data Sheet (MSDS) for each product. The MSDS, which is required for many chemical products by OSHA and is available from the seller or manufacturer, provides more complete information than the labels, including the ingredients and their characteristics and data on health hazards, first-aid procedures, protection and special precautions.

Naval Jelly and OxiSolv appear to be relatively benign, as you might expect from products sold for home use. Both warn against getting the stuff in your eyes and against excessive contact with skin. Solv-O "suggests" that you wear gloves and eye shields and says there are no harmful fumes. Naval Jelly "recommends" gloves and also cautions about eye contact. (Of course, neither should be swallowed.)

The warnings on the bottle and in the MSDS for DX 579 and DX 520 SG are altogether more daunting, citing considerable dangers from contact with eyes and skin and from inhalation and ingestion. Sobered, I phoned the Product Safety number provided by PPG to find out more—like many casual chemical users, I sometimes suspect that manufacturers exaggerate dangers to protect themselves from lawsuits. No, the representative informed me, they really do mean what they say. For best protection, you should wear impermeable, neoprene or latex rubber protective clothing and gloves and a face shield. Adequate ventilation is essential; even if you're working outdoors, a respirator rated for organic solvents is a good idea.

At first, that sounds like more trouble than it's worth. After all, my friend is still in good shape and he didn't do all that. But maybe he was lucky. We too often sacrifice safety for results, particularly if it's something that we need done right away (like test a bunch of rust removers...) or that we do infrequently—why go to all that trouble when I only need to remove rust once or twice a year? It only takes one errant splash of chemical into an unguarded eye to answer the question.

Fortunately, for rust removal there's a choice. I don't have the necessary gear and don't do a lot of rust removal, so I'll

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stick with OxiSolv or Naval Jelly. But if you do much wood finishing you may have everything but the impermeable suit of clothes already on hand, and disposable coveralls are easily bought. If you're going to use a professional product, use it like a professional.

That caution goes, of course, for any chemical. Read the label, request the MSDS or other safety information. If you don't understand the warnings or the recommendations, call the manufacturer. Everyone I spoke with was eager to help me out. When I mentioned to the woman at PPG that I didn't understand a lot of the technical stuff on the MSDS, she offered to send me a glossary of terms and a technical sheet explaining, in ordinary language, how to use the product safely. If a company is reluctant to provide such material, you should be reluctant to use their products.



Sources

Rust Removers

D-Rust/7

Constantine's
2050 Eastchester Road
Bronx, NY 10461
Tel. 1-800-223-8087
\$7.45 for 8 ounces with applicator

Duro Naval Jelly

About \$6.00 per pint from hardware stores

OxiSolv

Garrett Wade
161 Avenue of the Americas
New York, NY 10013-1299
Tel. 1-800-221-2942
1 pint, \$7.75

PPG Metal Cleaner DX 579

\$7-8.00 per quart from auto parts stores or auto paint suppliers.

Rust Protection

Dyna Glide

Woodcraft
210 Wood County
Industrial Park
P.O. Box 1686
Parkersburg, WV 26102
Tel. 1-800-535-4486
\$9.95 for 12 ounces

Kurobara Camellia Oil

Japan Woodworker
1731 Clement Ave.
Alameda, CA 94501
Tel. 1-800-537-7820
\$11.95 for 3 ounces and applicator;
\$10.95 for 8-ounce refill

PPG Metal Conditioner DX 520 SG

\$7-8.00 per quart from auto parts stores or auto paint suppliers

Top-Cote

Constantine's
(address and phone number above)
10-ounce bottle, \$10.25

Rust Preventive Paper

Garrett Wade
(address and phone number above)
\$5.50 for 25 10-inch x 15-inch sheets

Boeshield T-9

Woodworker's Supply
5604 Alameda Place NE
Albuquerque, NM 87113
Tel. 1-800-645-9292
\$10.95 for 12 ounces

RD 90

Sprayway
Tel. 1-800-332-9000
\$3.35 for 11 ounces

Counterpoint

Associate editor Dave Peters, saddled with the task of cleaning and sharpening the gouges in the photo on page 20, soon reverted to his tried and true rust-removal system—a wire wheel, silicon carbide wet-or-dry sandpaper, and steel wool. Here's why.

Armed with the chemicals, trays, and other sundries from Roger Holmes' Rust Busting article, I set out to ready the gouges and the small chariot plane for the after portion of the before/after photographs. As the before photo shows, several of the tools were severely rusted, with some fairly deep pitting. As is common with this type of heavy rust, the long-term rusting action had left built-up areas of rust and scale.

After donning my gloves, mask, rubber apron and protective goggles, I set out to let the chemicals do their magic. It was a bright Saturday morning, with the temperature at a brisk 20°F—not an ideal temperature for the best chemical action. But after all, I had here the latest in rust removal technology, so why worry.

Well, after a half hour spent on just my first gouge, I threw in the proverbial towel. The chemicals were messy, and I had to take great care to shoo away the kids and cats, lest a stray drop end up in their eyes. On the most serious rust, I was spending an inordinate amount of time with the Scotch-brite pads, to the point where I was in danger of rubbing a hole in my protective gloves. Thinking that the cold temperature was compromising the chemical action, I moved the operation indoors, but with only marginally better luck. And I still had to look forward to cleaning up the tool, the mess, myself and disposing of the chemicals—another problem I wasn't sure how to handle. Moreover, based on the time spent on the first gouge, I'd be working at this all day.

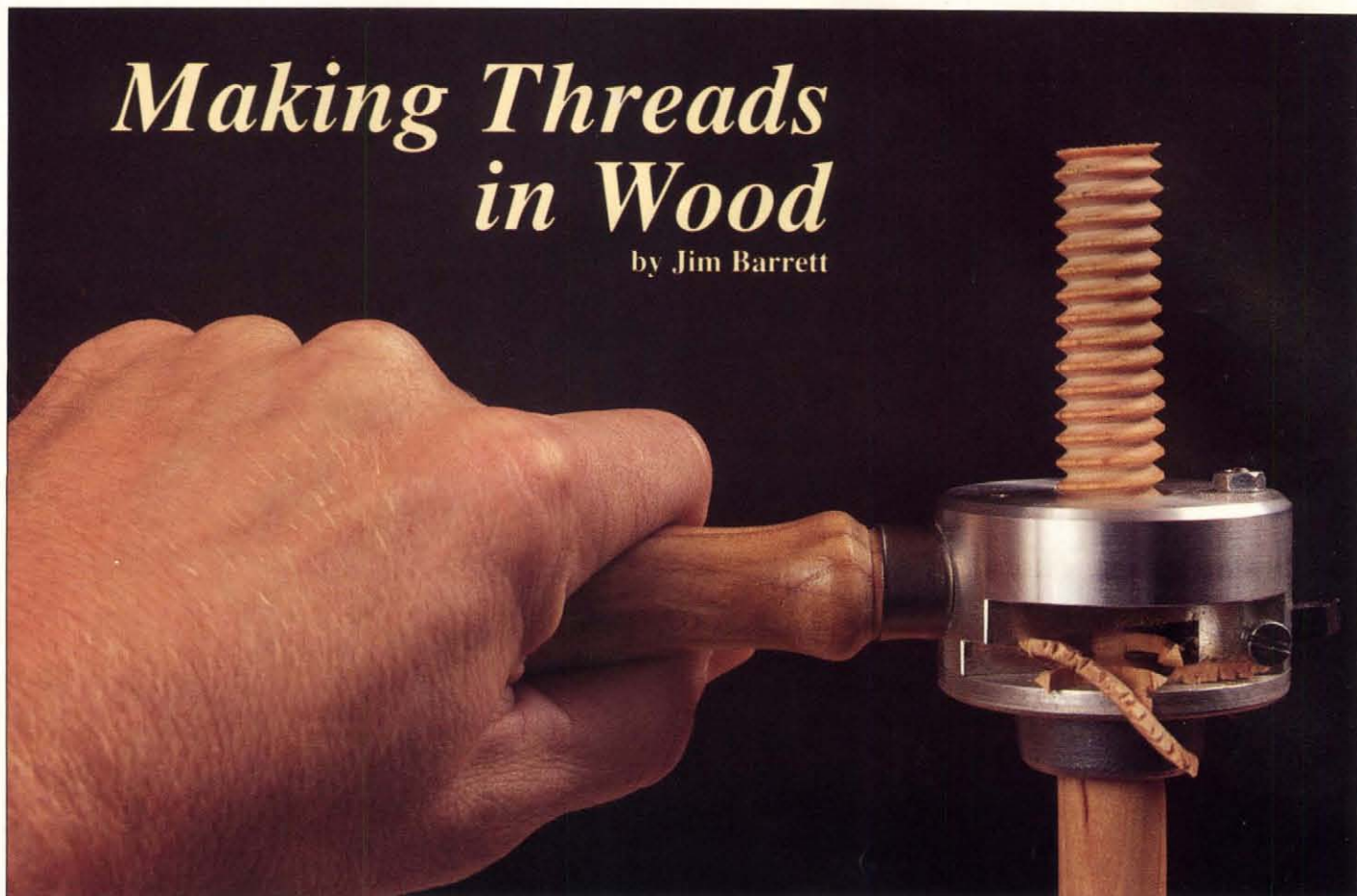
I took the easy way out, and decided to clean these tools using the same time-tested system that I've always used for rust. An hour later, after spending a few minutes on the wire wheel with each gouge, followed by some polishing with silicon carbide wet-or-dry sandpaper (lubricated with honing or light machine oil), and finally steel wool, I had the tools all cleaned and polished. Sure my tools didn't have that protective layer of self-sacrificing zinc, but then I didn't plan on storing those tools where they'd be subject to rust. And I prefer the look of polished steel to the dull gray of the zinc coated surface.

Yet, perhaps best of all, when my work was done, I didn't have a mess of scary chemicals to deal with. Even if they are easily diluted with water and washed away down the drain, somehow, in this day and age, I just feel a little bit better about myself when I'm not adding more chemicals to the environment. The money saved in chemicals and protective gear not bought, the confidence of working without worry of fumes or skin contact, and the time saved in cleaning up, all combine to confirm that when it comes to rust removal, I feel there's just no substitute for a wire wheel and old-fashioned elbow grease.



Making Threads in Wood

by Jim Barrett



It's not often that a project calls for threaded wood components. But, when my editor Dave Peters decided to make the handscrew project on page 54, he asked me to find and try out some commercially available wood threading devices that could be used to cut the internal and external threads for the handscrew. My search turned up four such devices: the router-operated Beall wood threader, a precision tap and die set available from Frog Tool Company, and two threadbox-type wood threaders from AMT and Conover.

All four of these wood threaders work similarly to a machinist's tap and die set. The AMT, Conover, and Frog Tool threaders have hand-operated dies for cutting the external (male) threads in dowel stock; the Beall is a router-operated thread-cutting device into which you feed the dowel stock. All use hand-operated threaded taps for cutting

the mating internal (female) threads. When it comes to making clean, accurately sized threads, I discovered that the type of threader you buy isn't nearly as important as the species and quality of the dowel stock you use. After a brief discussion of how each threader works, I'll cover this point in more detail. My other discovery was that wood threaders hold a particular fascination with children. I let my 8-year-old daughter play with one of the threadboxes, and before I knew it, she had threaded a good six feet of dowel! The hand-operated threadboxes and dies are safe and easy enough for young kids to operate; using the taps requires a bit more skill.

AMT and Conover Threadboxes

These two wood threaders are a modern variation of the threadboxes used by 19th century woodworkers. The two-piece "box" houses a die, which con-

sists of a V-shaped cutter (which has the same profile as a carver's veining tool) followed by a threaded metal guide bushing. Detaching the bottom section of the box exposes the cutter, as shown in the photo on page 26. If you need to make minor adjustments to the cutter, you loosen the large acorn nut on the top side of the threadbox, position the cutter, retighten the nut and reassemble the box.

The cutter should be adjusted so it will cut an external thread just a hair smaller than the diameter of the internal thread cut by the tap. This will allow for any expansion or contraction in the mating pieces that would cause the threads to bind. Both threadboxes I tried came preadjusted from the factory, and worked perfectly.

While both of these threadboxes do a respectable job on most hardwoods, they're not recommended for extremely dense woods such as rock maple. How-

Special Techniques

Continued

ever, I had no problems cutting threads in my sample dowels of cherry, walnut, maple, and birch. As noted in the manufacturer's instructions, the threadboxes cut better if you first coat the dowels with a lubricant, such as Danish oil, mineral oil, linseed oil (cut 50 percent with mineral spirits) or paraffin. Lubricating the dowel also extends the cutter life.

When using both threadboxes, I found that I had to work slowly; after turning the box three or four full revolutions, I backed it off to clear out the chips, then turned the box a few more times, backed it off, and so on. You have to be especially careful when cutting the first few threads: start slowly, holding the threadbox perfectly square to the dowel end. Chamfering the dowel end with sandpaper or a chamfering tool helps prevent initial chipping or splintering when you start the threads.

The Conover threadboxes come in $\frac{1}{2}$ in., $\frac{3}{4}$ in., and 1 in. sizes. The AMT threadboxes come in the aforementioned sizes plus $1\frac{1}{4}$ in. and $1\frac{1}{2}$ in. sizes. Conover sells their threadbox and matching tap as a set; a $\frac{3}{4}$ in. threadbox and matching tap can be ordered directly from Conover for \$64.95. Several major woodworking supply catalogs also carry this brand. AMT sells their threadboxes and taps through their tool catalog, and at a considerably lower cost than the Conover: For example, you can buy a $\frac{3}{4}$ in. set for about \$30. Both companies also offer special bottoming taps, designed to thread all the way to the bottom of a blind hole.

The AMT is a Taiwanese "clone" of the Conover. While the two look nearly identical on the outside, there are a few differences. When I disassembled both threadboxes, I noticed that on the AMT the two parts of the threadbox are held together by brass machine screws that screw into threaded sleeves; a bit better arrangement than the two brass wood screws used on the Conover for the same purpose. The taps that come with the AMT threadboxes have a built-in T-handle, so you don't need to use a wrench or other device to turn them—a



Photo A: Threadboxes from AMT and Conover (shown) enclose a V-shaped steel cutter followed by a threaded aluminum guide bushing.



Photo B: The AMT and Conover look virtually identical, but there are some differences, as explained in the text.

nifty feature that none of the other taps have.

Beall Wood Threader

The router-operated Beall is an automated version of the hand-operated die. The threader works with all conventional routers, although large, heavy-duty $\frac{1}{2}$ in. routers would be considered overkill for the threader. The inventor, J.R. Beall, told me that even the smallest $\frac{1}{4}$ in. consumer routers have enough power to cut threads in any type of stock. After mounting the router onto the threader and adjusting the router bit to the proper depth, you simply insert the dowel into the threader and twist it to cut the threads as shown in the photo on page 27. The basic unit accepts different inserts for cutting $\frac{3}{8}$ in., $\frac{1}{2}$ in., $\frac{5}{8}$ in. and 1 in. right-hand threads, and $\frac{1}{2}$ in., $\frac{3}{4}$ in. and 1 in. left-hand threads. The basic "kit," which includes the housing unit with a $\frac{3}{8}$ in. or $\frac{1}{2}$ in. insert, router

bit, and matching tap sells for about \$60 (a $\frac{5}{8}$ in., $\frac{3}{4}$ in. or 1 in. kit sells for about \$5 more). Larger kits with three, five, or all eight sizes are also available. Inserts, taps, and special bottoming taps are also sold individually.

I found the instructions easy to follow, and had no problems with the initial setup. It did take a bit of trial and error to adjust the router bit to the proper depth to make the external (male) threads match the internal (female) threads cut by the tap. However, once I had it set up, the Beall cut the external threads in all my sample dowel species quickly and accurately—much faster than the hand-operated dies. Because of the high speed of the router bit, lubricating the dowels isn't necessary. The instructions that came with the kit included plans for making a crank device for turning the dowel stock, as well as a wooden T-handle for turning the taps, and plans for several simple projects.



Photo C: The router-operated Beall threader quickly cuts male threads in even the hardest dowel stock—you simply twist the dowel into the unit, as shown. For portability, I mounted the unit on a short board, then clamped the board onto my bench, as shown.

Taps and Dies from Frog Tool

These precision, high-quality taps and dies are imported from Germany, and are sold exclusively by Frog Tool Company, Ltd. Both the tap and die cut amazingly clean threads, and did so much more quickly than the two thread-boxes I tried—like a hot knife through butter. I found that I didn't have to lubricate the dowels before cutting the threads, although I would still suggest this practice to get optimum results. Richard Watkins at Frog Tool noted that some woodworkers first soak the dowels in water to soften the wood and help prevent tearout while threading; others use a Teflon-type spray that leaves no residue like oil lubricants do.

Despite their high quality, I found one minor problem with the set I ordered. The tools come in metric sizes, which don't correspond precisely to their equivalent inch size. Depending on the size you buy, the guide nozzle on the die will be just a tiny bit larger or smaller than the inch equivalent (the 16mm die shown roughly corresponds to $\frac{5}{8}$ in.). Watkins told me this isn't a serious problem: if the dowel won't fit into the die, you simply remove the aluminum guide nozzle and enlarge the opening with sandpaper wrapped around a smaller dowel. I did notice that the

Photo D: Precision dies from Frog Tool cut the cleanest threads of all.



maple dowels sold by Frog Tool fit into their dies perfectly, but the $\frac{5}{8}$ in. dowels that I ordered from Constantine were a bit snug.

The sets are available in 11 sizes, ranging from $\frac{3}{8}$ in. to $2\frac{1}{2}$ in. (metric equivalent). These production-type dies don't come cheap, and they're really not intended for the weekend warrior. For example, at the time of this writing a $\frac{3}{4}$ in. set cost about \$135 postpaid; the $1\frac{1}{2}$ in. set ran a whopping \$463. But, you get what you pay for—if you're a perfectionist, you'll certainly appreciate these tools. When I wrote this article, not all sizes were in stock, so it's best to call or write Frog Tool before you place your order.

A Few Words on Taps

As mentioned, the taps for all the wood threaders are hand operated: first you

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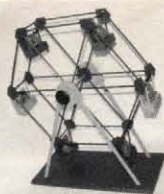
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#16081 1" Shaker Peg	5.50/100, 23.75/500
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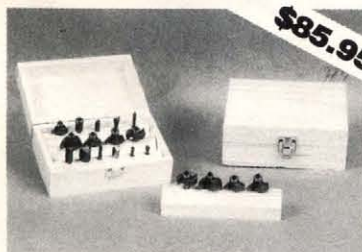
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Special Techniques

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Photo E: No matter what type of threading device you buy, the taps for them all work the same way. The AMT tap in foreground has a handy T-handle; the others must be turned with a wrench.

must drill a perfectly round hole with a diameter $\frac{1}{8}$ in. smaller than the tap diameter ($\frac{5}{8}$ in. for a $\frac{3}{4}$ in. hole, for example). You'll get best results if you use a high-quality brad-point bit or Forstner bit chucked in a drill press. (Ideally, your drill press should also be in good shape, with little or no runout). The taps that come with the Conover, Beall, and Frog Tool threaders require a wrench to turn them; the AMT has a built in T-handle, as mentioned earlier. The trick is to keep the tap perfectly vertical while cutting the first few threads. It helps to first rub a bit of Danish oil or other lubricant inside the hole to facilitate threading. With the Conover, AMT, and Beall taps, you need to back them out after every few turns to clear out the chips. The Frog Tool tap is designed so that the chips enter it's hollow center and fall out the bottom—you needn't back them out to clear out chips unless you're threading a stopped hole. While the taps supplied by the four manufacturers may all look alike, they're not interchangeable between brands.

What Size Threader Do You Buy?

Threaders are sized by the diameter of the dowel stock cut by the die or threadbox—the diameter of the finished

threaded stock will be slightly smaller than the initial dowel diameter. The size you choose, of course, will depend on your project requirements.

In my book, wood threaders are most useful for making wooden handscrews, such as the one featured on page 54. In most cases, the money you save by making several of your own handscrews will more than pay for the cost of the threader. As a rule of thumb, you would use a $\frac{3}{4}$ in. size for handscrews up to 10

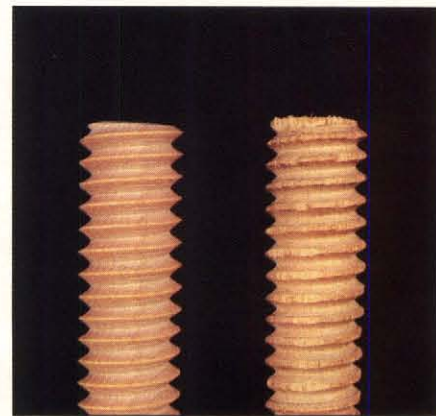


Photo F: Here, I used the same wood threader (Conover) to thread a high-quality maple dowel ordered from Constantine (left) and a typical "hardwood" dowel purchased at the corner hardware store (right)—the picture tells the story.

in. (jaw length) and a 1 in. size for handscrews over 10 in. Sizes for wooden screws on wood-jaw bench vises should be a minimum of 1 in. I consider the $\frac{3}{4}$ in. size to be the most versatile for most projects. Besides, the handles of most push brooms use this size thread—if nothing else, the die comes in handy for re-threading broken ones. This is also a good size for making threaded components on knockdown furniture.

Selecting Dowel Stock

Two points to consider here: the wood species, and the actual size of the dowels. Generally, the dowels available at your local hardware store or lumberyard are losers on both counts. Typically, these "hardwood" dowels are made from an imported species called *ramin*, which is a coarse, open-grained hardwood that usually tears out when you try to thread it. Even if you can find a relatively straight one (good luck!), most hardware-store dowels are slightly oversize in diameter, and aren't perfectly round. All of these factors affect the thread: Oversized dowels won't fit properly into the threader; undersize and out-of-round dowels make for a sloppy fit between the male and female threads. All of the threaders I used require the dowel stock be perfectly round and turned within a tolerance of plus or minus .005 in. Beall, Conover, and Frog Tool all sell high quality, accurately sized dowels for use with their threaders. Constantine's also carries precision-cut dowels in several different species. If you want to be perfectly assured that the dowels will fit your threader, or if you want dowels of an exotic species, you'll have to turn them on a lathe.

Closed-grain woods, such as white or yellow birch, alder, cherry, and maple work best for internal and external threads. These woods tend to cut clean threads with little or no tearout, and are durable enough to withstand frequent use, such as on handscrews or vises. Keep in mind that extremely dense woods, such as rock-hard maple or hickory will be a bit harder to thread, so

you'll need to work more slowly and provide plenty of lubrication; these woods will also dull the cutters more quickly. Some open-grained woods such as oak, and mahogany tend to split or splinter along the grain, so the threads often chip when you're cutting them, or later, when they're subjected to pressure. Although walnut has a semi-open grain, I had good results threading the walnut dowels from Constantine. Fir, pine and other softwoods don't make good threaded components because they're not durable and tend to tear out easily when threaded. When hand-selecting dowels, choose ones with straight, tight grain patterns.



Sources

AMT

Fourth Ave. and Spring St.
P.O. Box 70
Royersford, PA 19468
Tel. 1-800-383-2681

The Beall Tool Company

541 Swans Road N.E.
Newark, OH 43055
Tel. 1-800-331-4718

Conover Division

Byrom International Corp.
P.O. Box 246
Chardon, OH 44024
Tel. 1-800-722-5447

Constantine

2050 Eastchester Road
Bronx, NY 10461
Tel. 1-800-223-8087
*white birch, oak,
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Frog Tool Company, Ltd.

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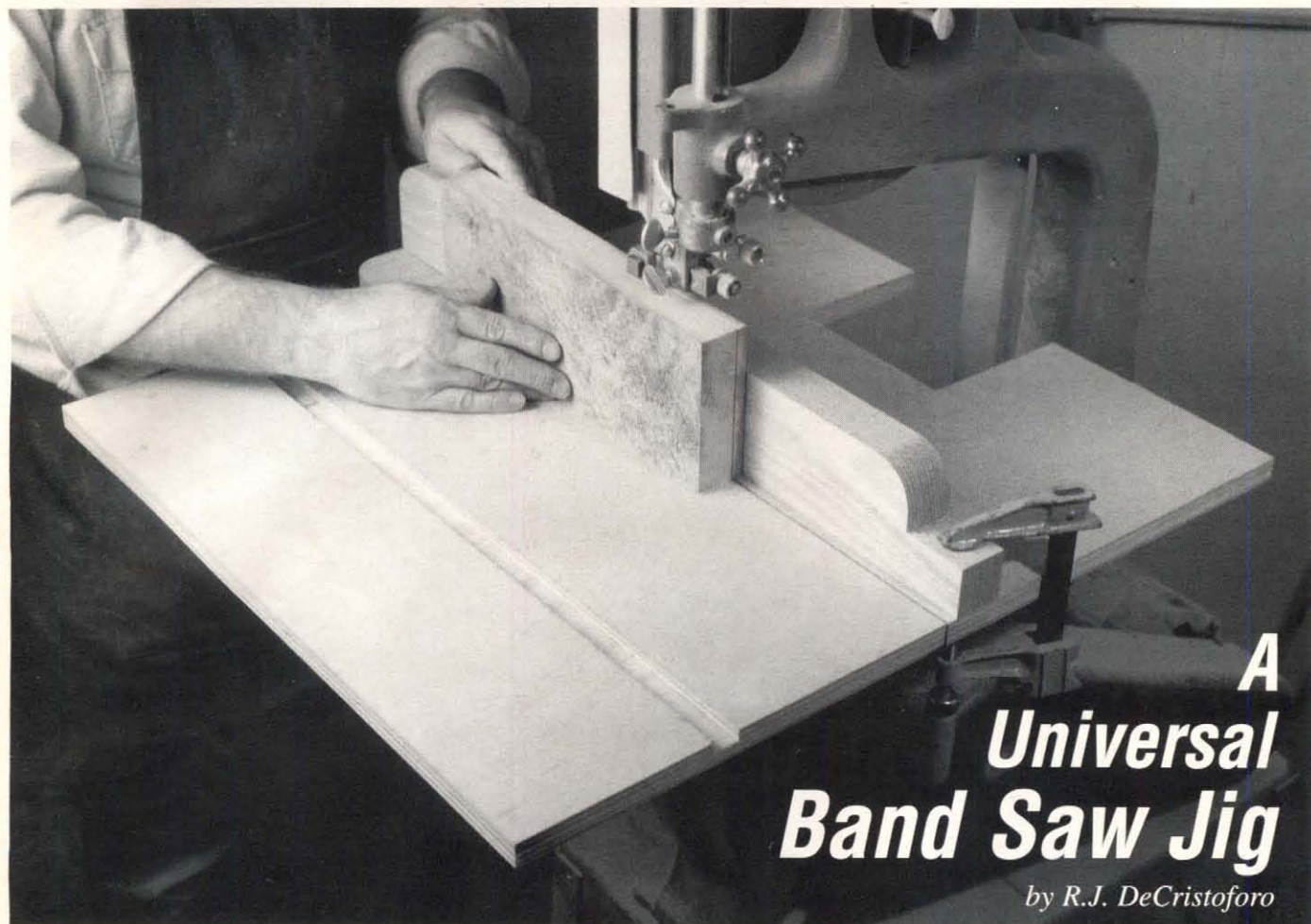
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Woodworking Basics



A Universal Band Saw Jig

by R.J. DeCristoforo

Anyone involved with tools soon learns that conceiving ideas for accessories even the manufacturer didn't think of is part of the fun of woodworking. The capability of a band saw, like other machines, is easily extended through the use of home-grown jigs and fixtures.

Our all-purpose concept provides for an oversize table plus accessories to use with it. Actually, anyone who is not interested in the overall view can select particular items that might suit special applications and use them as "individual" tools.

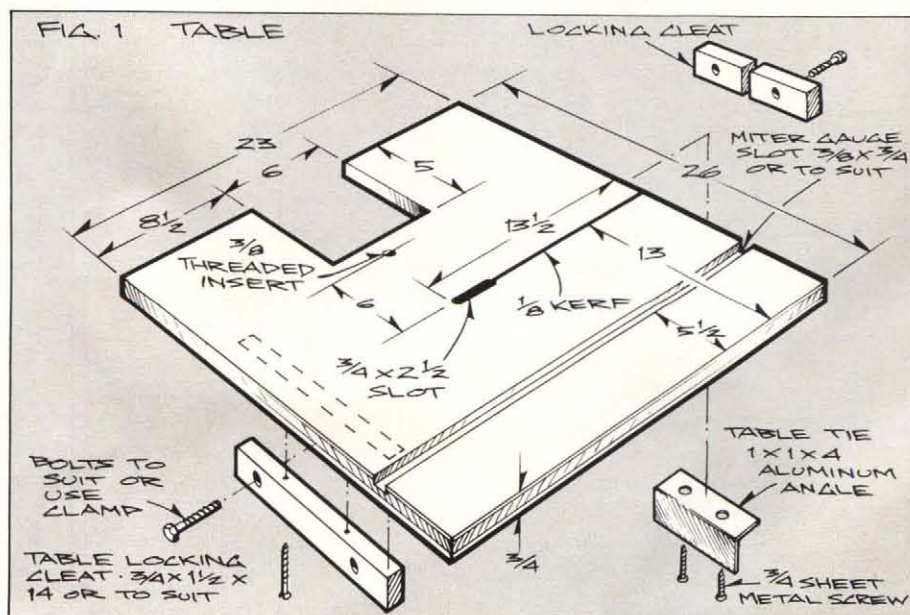
For the sake of clarity, the illustrations show the blade guard raised well above the workpiece. In practice, for safety, always adjust the guard so it is close to the workpiece.

The Table

Just adding an oversize table (see photo) is an asset for a home-shop band saw whose work-support area isn't generous.

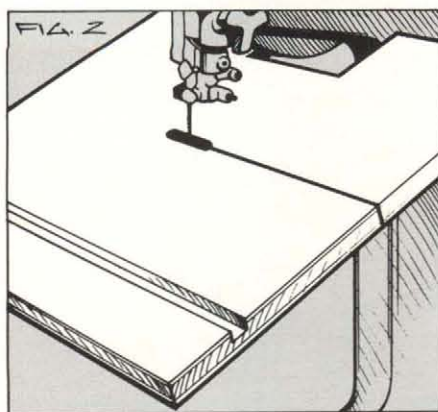
The table was designed for a Delta 14 in. machine with a 14 in. table. If your machine is similarly sized, you will be able to stay pretty close to the dimensions offered in Fig. 1.

In order to tilt the table at a sharp angle, a relief area (U-shaped in this case) must be cut in the table in order to allow it to clear the upper column (Fig. 2.). An L-shaped relief area will serve



the purpose if it is necessary to clear any rear-mounted tracking and tensioning mechanisms. The depth and shape of the relief cutout will determine how much the table can be tilted.

A locking bolt (see Fig. 12, "Locking Bolt Detail") that screws into a threaded insert is needed to secure several accessories that will be shown later. Hold off on the installation of this threaded insert until the accessories are described, since its location is critical.



Use a cabinet-grade $\frac{3}{4}$ in. thick maple or birch plywood for the table, sanding it carefully and then applying several coats of sealer with a light sanding between applications. Applying paste wax as a final step is a good idea since it will make it easier to move work.

Take the precaution of rechecking the machine's alignment. The angle between the blade and the horizontal plane of the table (when the trunnion is at zero) should be 90 degrees. The slot for the miter gauge and the side of the blade must be parallel.

Securing the oversize table to your band saw table is a fairly simple matter. Most band saw tables have a pair of holes on both the front and back edges. Cut a pair of cleats, as shown in Fig. 1, drill through them to match the hole spacing on your table, then glue and screw the cleats to the bottom of the oversize table. Locate the cleats carefully so they're flush with the edges of the regular table. Then just cut through the kerf side cleat to allow the blade to pass through when mounting the over-

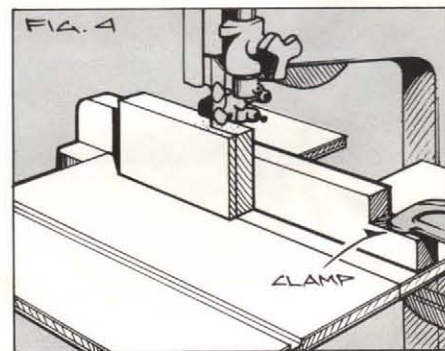
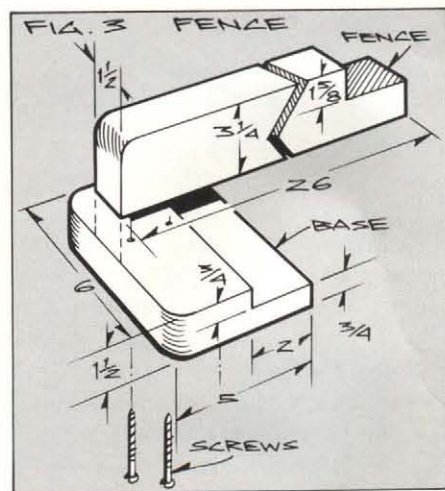
size table.

To mount the oversize table, raise your upper blade guide assembly to provide clearance, drop the table in position, then screw through the cleats and into the regular table. The table tie (also Fig. 1) is screwed to the underside of the oversize table, so it spans the $\frac{1}{8}$ in. kerf. The tie serves to keep the table on both sides of the kerf level.

The Fence

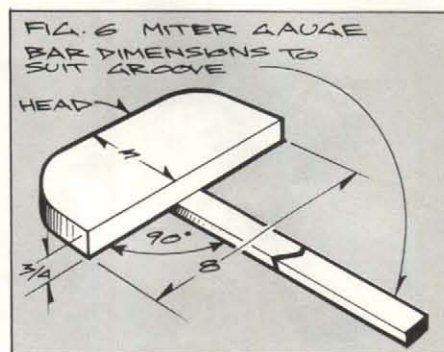
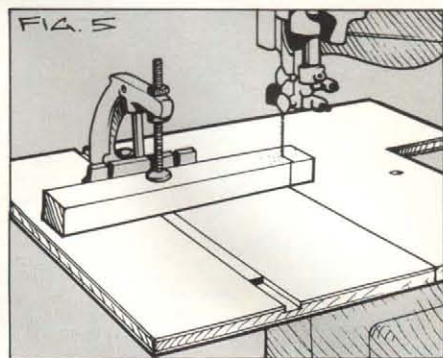
A critical factor for the fence is the dimensions of the rabbet cut in the base (Fig. 3). This should provide for a snug fit on the table. Be sure, when attaching the base, that the angle between it and the fence is 90 degrees. The fence is secured with a C-clamp at each end.

Fig. 4 shows the fence as a guide for resawing. It's always true when resawing, that the success of the job depends primarily on the condition of the blade. It must be sharp and free of "lead." Lead is the tendency on the part of the blade to move voluntarily left or right,



making it difficult to saw a straight line.

Use A Miter Gauge



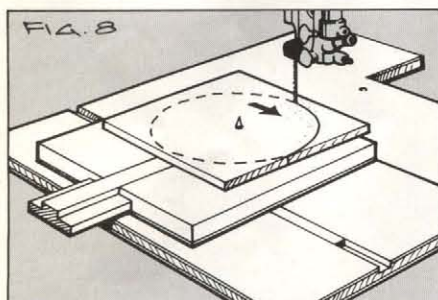
Use an on-hand miter gauge, preferably one with a hold-down, for miter cuts and for crosscutting (Fig. 5). Accuracy, here, will also depend on the condition of the blade and careful setting of the angle between the gauge and the blade. Feed steadily, but only at a pace that allows the blade to cut efficiently.

If a miter gauge is not available you can improvise for crosscutting by making a T-shaped guide (Fig. 6). Make the "head" about $\frac{3}{4}$ in. by 3 in. by 8 in.; the "bar" to suit the slot in the table. Assemble the two pieces so the angle between the head and bar is 90 degrees.

Controlled Circular Sawing

An adjustable, pivot-type jig that is made by following the details in Fig. 7, allows controlled sawing of perfect disks. The $\frac{1}{4}$ in. threaded insert is for a short set screw that is used to lock the position of the slide.

The work, impaled on a pivot, is rotated clockwise as shown in Fig. 8. There are two ways to operate. Cut the



In either case, it's critical that the pivot point and the front edge of the blade be on the same line. If this alignment isn't adhered to, the blade will not follow the circular path.

The length of the pivots can be sized

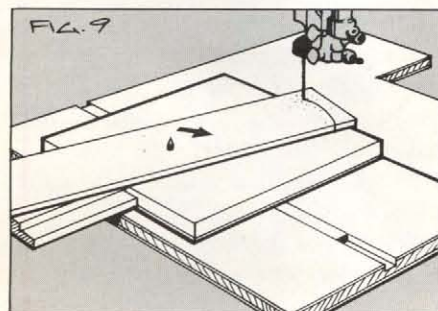
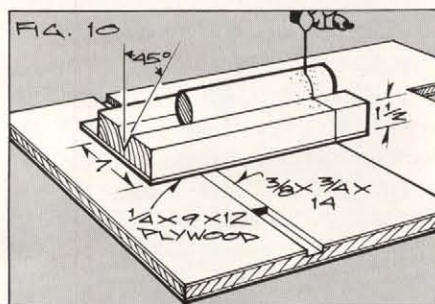


Fig. 9 suggests another use for the jig—rounding off the end of a component by using the pivot-sawing technique.

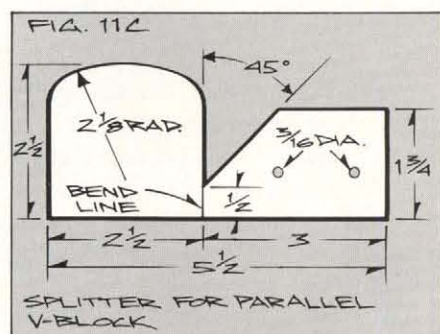
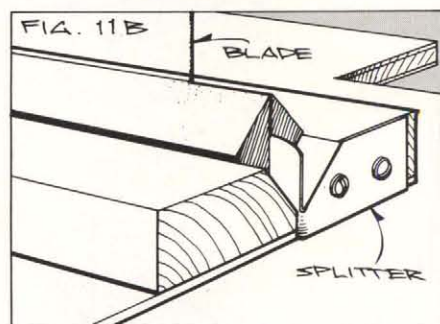
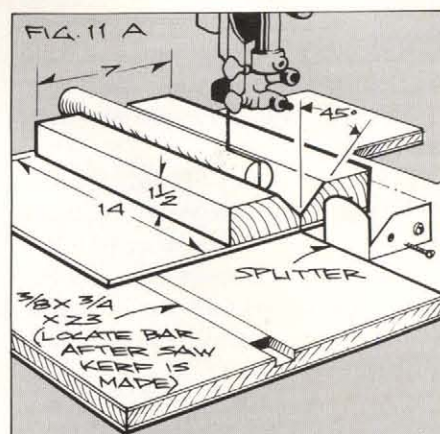
If you have ever cut a round shape on a band saw you know that the blade will tend to rotate the work. The safest and most accurate method for that type of sawing is to utilize a V-block. To make one that will suit the table, follow the details offered in Fig. 10. Make and assemble all the parts and then form the kerf with the jig mounted on the table.



When you need duplicate pieces, clamp a stop block near the front edge of the table on the left of the saw blade to gauge the length of the cutoffs.

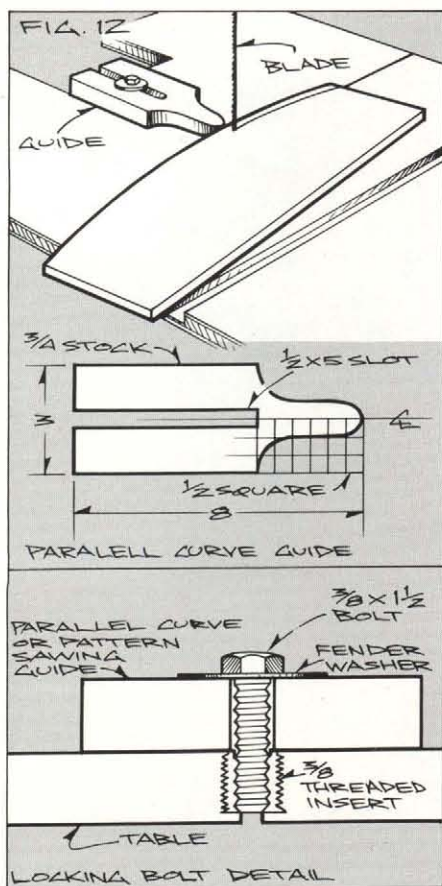
The parallel V-block makes it easy to saw round (Fig. 11a), or even square stock (Fig. 11b), exactly in half. Actually, after the first step, the half pieces can be sawed again to produce quarter-rounds.

To operate, clamp the jig in position and then move the work carefully until it engages the splitter. Thereafter, the splitter, which is made from a piece of thin sheet metal, will do the job of



maintaining correct alignment. When you approach the end of the cut, use a push stick to complete the job so your hands can stay away from the blade. Fig. 11c offers dimensions for a splitter that is just right for the jig.

Sawing parallel curves requires the guide and locking bolt that are sketched in Fig. 12. Make the guide first and then install the threaded insert that is shown in Fig. 1. The idea is to locate the insert so the guide can be secured with its point directly opposite the leading edge of the blade. Cutting a 1/2 in. wide slot in the guide and using a 3/8 in. locking bolt allows a little room for adjustment.

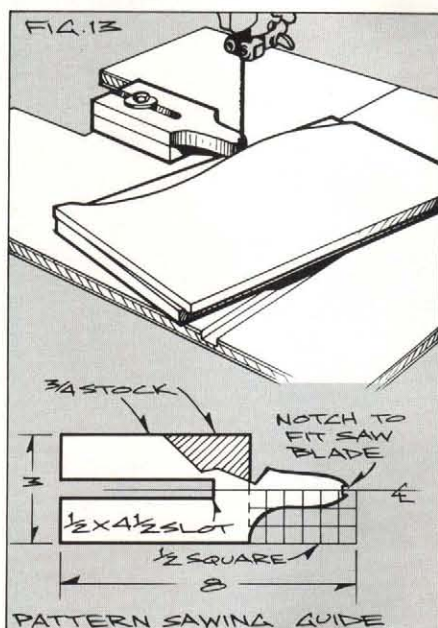


The work is accomplished by first freehand sawing and sanding the curve that is needed, then passing the work between the point of the guide and the blade. The distance between the two points establishes the width of the component. To be successful, you make the pass so that the curve of the work is always tangent to the point of the guide.

To allow for slight discrepancies, cut the parts a bit wider than necessary; then stack them together with double-stick tape and sand them as if they were a solid block.

Pattern Sawing

The difference between a guide for parallel curve sawing and one for pattern sawing is shown in Fig. 13. The guide is elevated so the edge of the work can pass beneath it, and its front edge is notched to fit the saw blade. The operation involves first cutting a pattern that duplicates the shape you need. The pattern, tack-nailed or held to the work with double-faced tape, rides against the

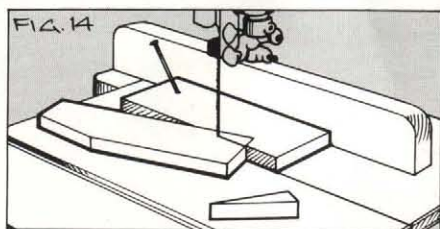


edge of the guide so the blade can follow its configuration. Thus, the workpiece (which is on the bottom) is shaped to match the pattern.

The notch in the guide must provide a nice fit for the saw blade. Keep the work moving steadily; maintain constant contact between the pattern and the guide.

Notching Jigs

A notching jig is a rectangular piece of wood with a particular shape cut into



one edge. The cutout, wedge-shaped in the example shown in Fig. 14, can be the shape of the part that is needed or the area you wish to remove from the work. Situate the jig so that its bearing edge is against the blade, then move both jig and work past the saw blade. As shown, a large nail, driven at an angle into the jig, serves nicely as a pusher.

Jigs work in good fashion when they are carefully made. Since, most times, jigs become permanent accessories, it pays to take the time to make them correctly.



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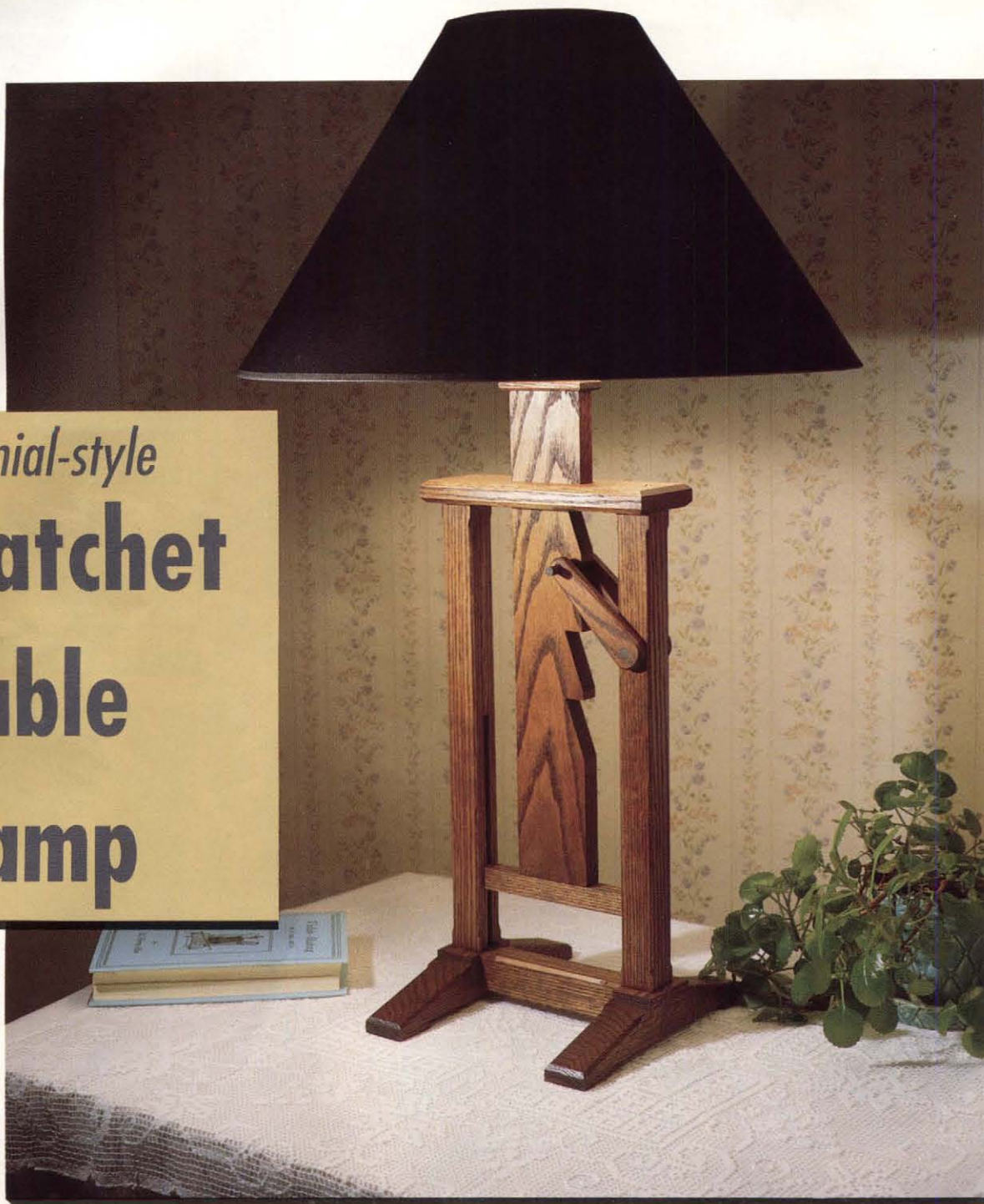


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sary parts. And if you can't find a satisfactory lamp shade, we've included a source for that also.

Begin by cutting all the lamp base parts (except part H) to the dimensions shown in the Bill of Materials.

The stretcher (B) and the two posts (C) have identical tenons, so they can be cut next. Note, though, that the tenons

are not on center, but have a $\frac{1}{4}$ in. shoulder on one side and a $\frac{1}{2}$ in. shoulder on the other side. We used the table saw and dado head, with a miter gauge, to support the stock as it passes over the cutter.

The dado head can also be put to use on the ratchet (E). Use it to cut the $\frac{1}{2}$ in. long tenon on the bottom end (see

Detail) and the $\frac{1}{4}$ in. wide by $\frac{1}{2}$ in. deep groove along one edge. Also, at this time, cut the tenons on each end of the guide (D).

The $\frac{1}{4}$ in. wide by $\frac{1}{2}$ in. deep stopped grooves in the posts are best cut using the router table. As shown in the front view, the groove is cut $8\frac{1}{4}$ in. long. Since the router bit creates a rounded corner, you'll need to square the end with a chisel.

Next, lay out and mark the location of the mortises on the two feet (A), the top (F) and the guide. Note that the guide

mortise is slightly off center, and longer on the left side, to create a space for the cord. To cut the mortises, use a drill bit to remove most of the material, then pare the remaining waste with a chisel. The $\frac{13}{16}$ in. by $2\frac{13}{16}$ opening in the top (for the ratchet) can also be made now.

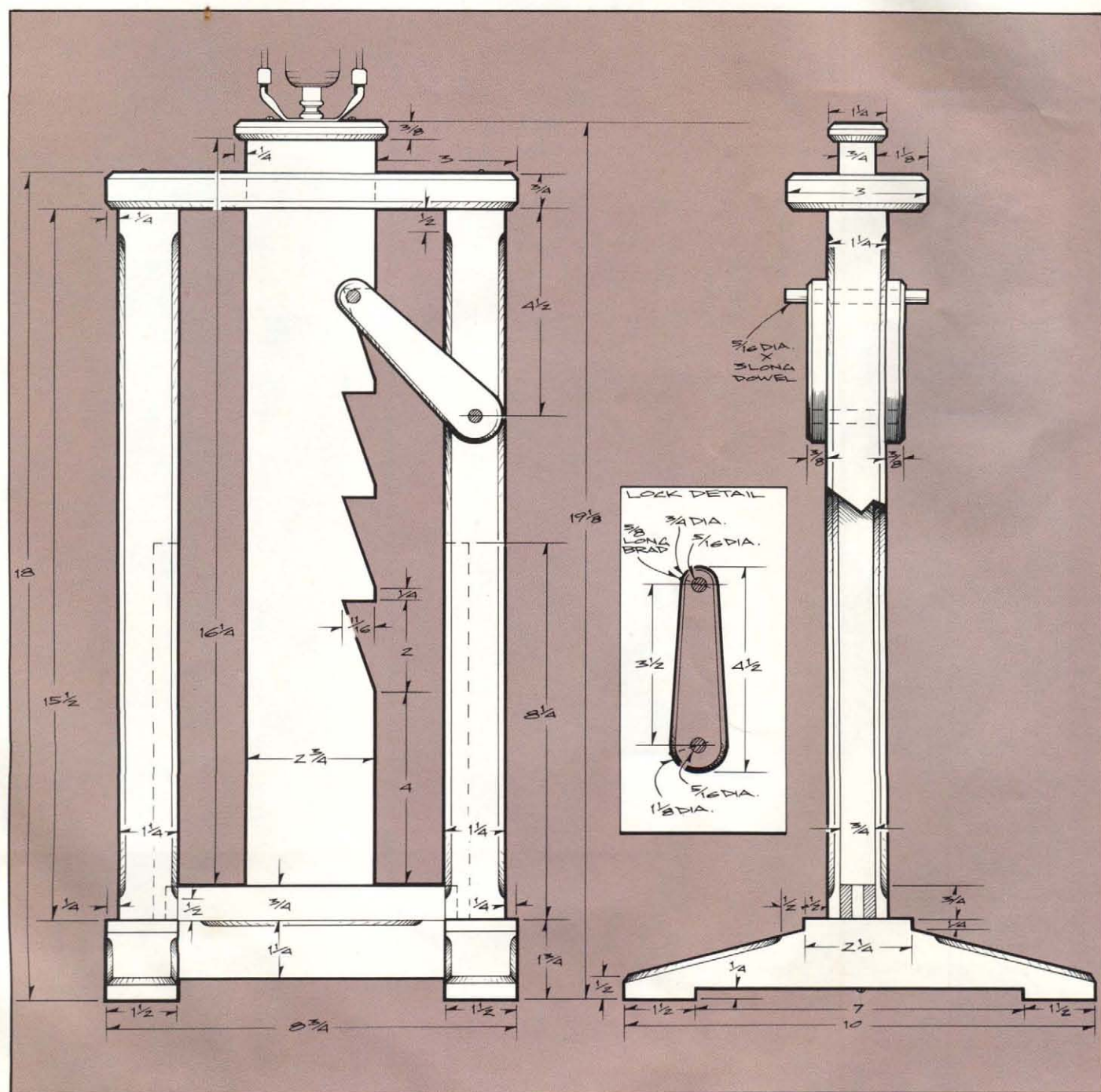
The band saw can now be used to cut both the taper and the $\frac{1}{4}$ in. by 7 in. long step in each foot. Also, the locks (I) are cut to shape on the band saw, as are the ratchet teeth.

As shown on the drawing, a chamfer is applied to a number of the lamp base

parts. Use the router table and a 45 degree chamfering bit to cut a $\frac{1}{4}$ in. wide chamfer on the top, a $\frac{3}{16}$ in. wide chamfer on the foot, stretcher and post, and a $\frac{1}{8}$ in. wide chamfer on the locks and cap. You'll need to use a file or disk sander to chamfer the ends of the feet.

All the parts can now be given a thorough sanding, finishing with 220-grit. Take care not to round over the chamfers as you sand.

The two feet and the stretcher can now be joined. Apply a thin coat of glue to each mortise and tenon, then assemble



and clamp firmly. Make sure the parts are square. When dry, drill the $\frac{5}{16}$ in. diameter lamp cord hole through one of the feet as shown in the exploded view. Locate the hole so that it lines up with the back edge of the $\frac{1}{2}$ in. deep post slot. Use a countersink bit to apply a generous bevel to the hole on the underside of the foot.

Several more holes are also bored now. Start with a $\frac{1}{4}$ in. diameter hole through one end of the guide and into the mortise. Then, using a pair of 1 in. long by no. 6 ovalhead brass wood screws, join the cap to the ratchet. Be sure to bore pilot holes before driving the screws. Next, bore a $\frac{3}{8}$ in. diameter hole through the center of the cap and into the top end of the ratchet. Make the ratchet hole $1\frac{1}{2}$ in. deep to accept the threaded nipple (J) later on. Also, bore a 45 degree angled hole (see Wiring Diagram) to connect the ratchet groove with the hole for the threaded nipple. Next, clamp the two locks back-to-back and use the drill press to bore the pair of $\frac{5}{16}$ in. diameter holes in each one. Finally, at a point $4\frac{1}{2}$ in. from the top end of the post, bore a $\frac{3}{8}$ in. diameter pivot hole for the lock.

Cut the filler (H), sizing it for a press fit in the ratchet groove. A press fit eliminates the need for glue, so the filler can be easily removed should the cord ever need to be replaced.

All parts can now be final sanded in preparation for staining. The various moving and interlocking parts make this a difficult piece to stain once it is assembled, so it's best to stain before most of the parts are joined. Just be sure to avoid getting stain on any surfaces that will later be glued, as the stain could reduce the glue strength. We used two coats of Minwax's Jacobean Wood Finish.

After staining, use epoxy to glue the 2 in. long threaded nipple in place. It should extend above the cap about $\frac{7}{8}$ in. if you use the hardware specified in the kit. You may need to adjust the depth a bit if you use other hardware. The lamp is now ready for assembly. You'll note that the joints are assembled with screws rather than glue. Like the press-fitted filler cut earlier, this will make it easier to replace the cord should it ever become

damaged.

Begin by feeding the end of the lamp cord (O) up through the foot, into the hole in the end of the guide, and out the mortise. Temporarily assemble the ratchet to the guide, then run the cord up the ratchet groove, into the angled hole and out the threaded nipple. Once the cord has been threaded, the guide is joined to the ratchet using three screws driven up through the bottom of the guide. Assemble the lock to the post with a pair of $\frac{5}{16}$ in. diameter dowel pins as shown. The dowels are secured with brads (see Lock Detail).

Now attach the posts by driving a woodscrew through the bottom of the foot and into each post tenon. Also add the top, securing it with a pair of 1 in. by no. 8 ovalhead brass wood screws driven

into the tenons. Check the ratchet for a smooth sliding fit. If it's a little sticky, a thin coat of paste wax in the groove will help. Keep in mind that when the ratchet is lowered from its highest position, you'll need to pull out the excess cord from the bottom of the foot.

Add the harp (K) and spindle (L), then thread the lower half of the socket (M) to the nipple and secure it with the set screw. Wire the cord to the upper half of the socket and snap the two halves together. If you can't find a satisfactory lamp shade (P) locally, we've listed a mail-order source (see Bill of materials) for the one we used. The shade is held in place by the threaded finial (N). 

Bill of Materials (all dimensions actual)

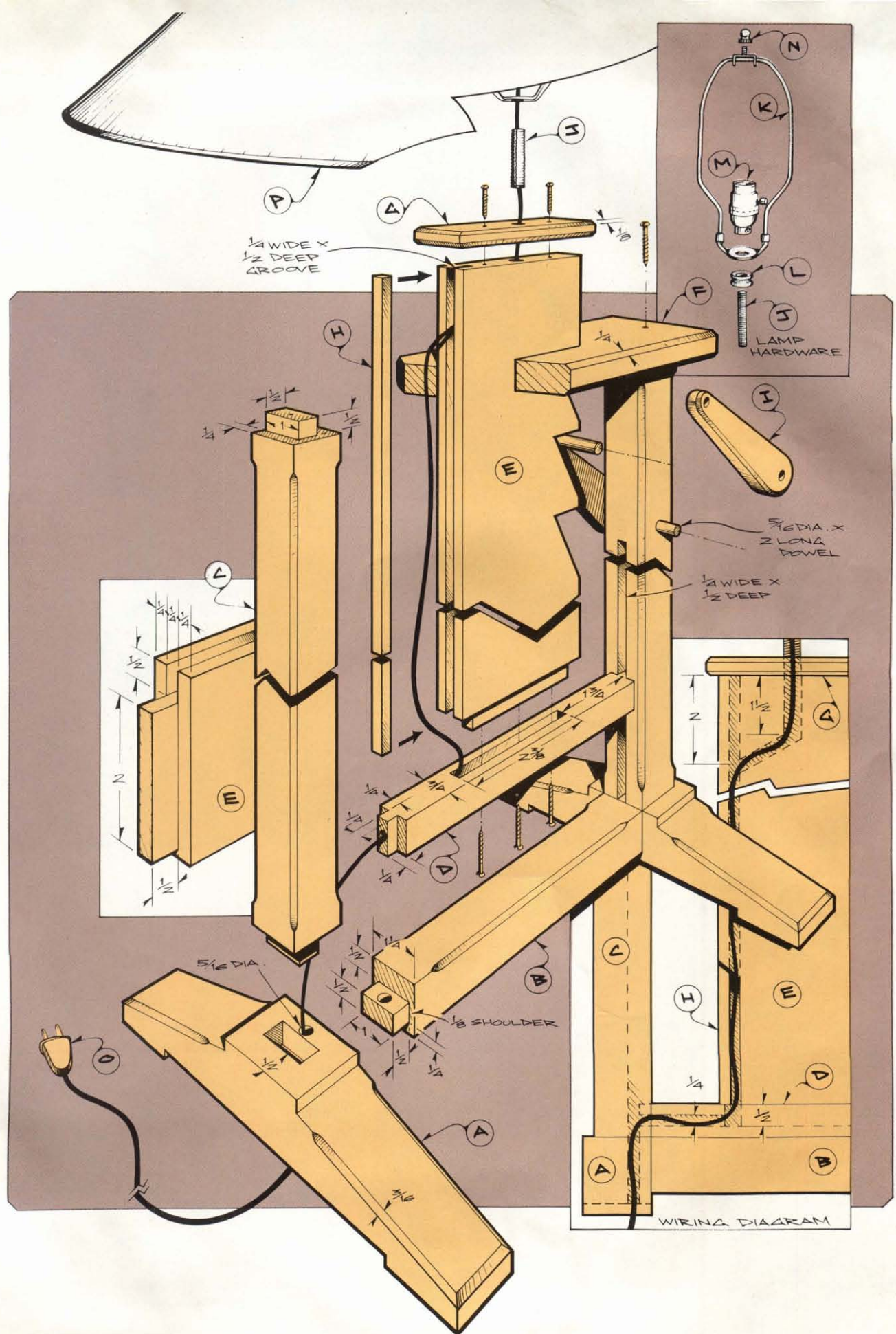
Part	Description	Size	No. Req'd.
Lamp Base			
A	Foot	$1\frac{3}{4} \times 1\frac{1}{2} \times 10$	2
B	Stretcher	$1\frac{1}{4} \times 1\frac{1}{4} \times 6\frac{3}{4}$ *	1
C	Post	$1\frac{1}{4} \times 1\frac{1}{4} \times 16\frac{1}{2}$ *	2
D	Guide	$\frac{3}{4} \times \frac{3}{4} \times 6\frac{1}{4}$ *	1
E	Ratchet	$\frac{3}{4} \times 2\frac{3}{4} \times 16\frac{3}{4}$ *	1
F	Top	$\frac{3}{4} \times 3 \times 8\frac{3}{4}$	1
G	Cap	$\frac{3}{8} \times 1\frac{1}{4} \times 3\frac{1}{4}$	1
H	Filler	$\frac{1}{4} \times \frac{1}{4} \times 16\frac{1}{4}$	1
I	Lock	$\frac{3}{8} \times 1\frac{1}{8} \times 4\frac{1}{2}$	2
Hardware			
J	Threaded Nipple**	$\frac{3}{8}$ O.D. x 2 long	1
K	Harp**	10 in.	1
L	Spindle**	$\frac{9}{16}$ high	1
M	Socket**	3-way	1
N	Finial**	$\frac{1}{2}$ high	1
O	Lamp Cord w/plug**	8 feet	1
P	Lamp Shade***	20 in.	1

* Length includes tenons.

** Parts J through O are available as a kit from Paxton Hardware, 7818 Bradshaw Road, Upper Falls, MD 21156; tel. (301) 592-8505. Order Kit No. 8722. Current price is \$10.50 postpaid.

*** Part P is available from The Lamp Shop, 934 Federal Road, Brookfield, CT 06804; tel. (203) 775-1231. Order "Hedy's F1 Black Coolie 20 in. Lamp Shade." Current price is \$30.95 plus \$5 postage and handling.







An Early American Classic

Sideboard Chest

Major case construction typically isn't much different than working with smaller pieces, with a few notable exceptions. First, buying stock usually requires a three-figure check; second, unless your name is Jorgensen you can expect to run short of clamps; and, finally, at some point in the construction you'll probably wonder why you decided to undertake this project rather than buy that \$129 printed paper-over-particleboard substitute from the department store. But then, once all the little problems have been muddled through, and you stand proudly before a piece made wholly through your own sweat and determination, can there be any doubt as to whether it was all worth the effort? Of course not!

While we may not all aspire to a career in woodworking, it's refreshing to know that there are people out there making a comfortable living doing what they love. This sideboard chest

is from the workshop of Gene Cosloy in Wayland, Massachusetts. Although Gene was originally employed in Massachusetts' "Silicon Valley," some years back he gave up the high-tech world for the chance to make a living in his workshop—and the gamble paid off. Gene has recently expanded into a real shop from his basement, and together with wife and business partner Lois, continues to prove that there's a growing market for hand-made furniture that has good design and quality construction.

The chest shown is of eastern white pine, finished with a warm nut-brown stain. However, it would also look fine in cherry or walnut. You'll want to start construction by edge-gluing stock for the wide parts, which include the top and bottom (A), the ends (B), the center divider (C), the shelves (D), and the raised panels (V). If you are making the chest in pine,

try to buy boards that are as close as possible to the final required size. This will help minimize waste.

The Case

This piece, like much similar work, uses dovetails for the case and drawer construction. You could cut the dovetails by hand, but the best tool for the job is the router and an adjustable dovetail jig, such as the Leigh dovetail system. Cut the top, bottom, ends, center divider and shelves to length and width, then lay out the various dadoes. Because the size of these pieces makes them a little awkward to handle on most small table saws, use a router and a T-square edge guide to establish the dadoes.

Next, get to work on the dovetails. Use our suggested dovetail spacing, or come up with your own. Note, though that the top and bottom overhang the ends at the front by the thickness of the face frame, so the dovetails must start back a bit from the front edge. Also, don't forget to position the center divider and shelves $\frac{3}{4}$ in. inset from the back edge, to allow for the back (Q, R). After test fitting, glue and assemble the case. Be sure to check the diagonals to make certain the chest is square.

Once the case is dry and out of clamps, you can cut the rabbet for the back. You'll need to square the corners of the rabbet with the chisel. If you use a bearing guided bit, the bearing will be in the way where the center divider meets the top and bottom, and where the shelves meet the sides. Switch to a straight cutter and use the edge guide to complete the rabbet in these areas. Then cut the back parts to size and mount them. Note that the back sections are sized to leave a $\frac{1}{8}$ in. space between each piece, to allow for wood movement.

Now make the stretchers (E), runners (F), and the center, side and top guides (G, H, I). Note that the thickness of the center guides is $\frac{3}{8}$ in., while the side guide thickness is $\frac{3}{4}$ in. Glue the front stretchers in place, then mount the runners and guides. The runners are glued and screwed to their respective guides, and a screw is also inserted up through the stretcher into the side and center guides. The side, center and top guides are then screwed into the sides and center divider respectively, with the back holes being slotted to direct any wood movement in the wide parts toward the back.

The Face Frame and Moldings

Next up is the face frame, consisting of the top, center and bottom rails (J, K, L) and the end and center stiles (M, N). Tenons join the top and bottom rails to the end stiles, while a dovetail anchors the center rail to these same parts. The center stile is joined to the three rails with simple half-lap joinery. Assemble and mount the face frame directly to the case. The fact that the case is square should serve to square up the face frame.

To finish the case work, just miter and add the top and base moldings (O, P). Both moldings are common lumberyard moldings. The top molding is sold as a solid crown molding, and the base is usually called a door stop molding. Similar moldings can be shopmade, but with the low-cost of the lumberyard moldings, they seem the obvious choice. You may need to rip a little stock from the lumberyard moldings you buy to achieve the dimensions shown.

Bill of Materials

(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Top/Bottom	$\frac{3}{4}$ x $17\frac{3}{8}$ x 62	2
B	End	$\frac{3}{4}$ x $16\frac{5}{8}$ x $32\frac{1}{2}$	2
C	Center Divider	$\frac{3}{4}$ x $15\frac{7}{8}$ x $31\frac{1}{4}$	1
D	Shelf	$\frac{3}{4}$ x $15\frac{7}{8}$ x $30\frac{1}{8}$	2
E	Stretcher	$\frac{3}{4}$ x $1\frac{3}{4}$ x $30\frac{1}{8}$	2
F	Runner	$\frac{3}{4}$ x $1\frac{3}{4}$ x 14^*	4
G	Center Guide	$\frac{3}{8}$ x 1 x $15\frac{3}{4}^*$	2
H	Side Guide	$\frac{3}{4}$ x 1 x $15\frac{3}{4}^*$	2
I	Top Guide	$\frac{3}{4}$ x $1\frac{3}{4}$ x $15\frac{3}{4}^*$	4
J	Top Rail	$\frac{3}{4}$ x 1 x $60\frac{1}{2}^{**}$	1
K	Center Rail	$\frac{3}{4}$ x $1\frac{1}{2}$ x 61	1
L	Bottom Rail	$\frac{3}{4}$ x $1\frac{1}{4}$ x $60\frac{1}{2}^{**}$	1
M	End Stile	$\frac{3}{4}$ x $1\frac{1}{2}$ x 31	2
N	Center Stile	$\frac{3}{4}$ x $1\frac{1}{2}$ x 31	1
O	Top Molding	$\frac{3}{4}$ x $1\frac{1}{8}$	about 9 ft.
P	Base Molding	$1\frac{1}{2}$ x $1\frac{1}{2}$	about 9 ft.
Q	Back Center Section	$\frac{3}{4}$ x $7\frac{1}{2}$ x $31\frac{3}{4}$	7
R	Back End Section	$\frac{3}{4}$ x $6\frac{1}{16}$ x $31\frac{3}{4}$	2
Doors			
S	Stile	$\frac{3}{4}$ x 2 x $21\frac{3}{4}$	8
T	Top Rail	$\frac{3}{4}$ x 2 x $14\frac{3}{8}^{**}$	4
U	Bottom Rail	$\frac{3}{4}$ x $2\frac{1}{2}$ x $14\frac{3}{8}^{**}$	4
V	Raised Panel	$1\frac{1}{2}$ x $10\frac{5}{8}$ x $17\frac{3}{4}^{***}$	4
Drawers			
W	Front	$\frac{3}{4}$ x 6 x $29\frac{1}{4}$	2
X	Back	$1\frac{1}{2}$ x 5 x $28\frac{3}{4}$	2
Y	Side	$1\frac{1}{2}$ x $5\frac{1}{2}$ x $16\frac{1}{2}^*$	4
Z	Bottom	$1\frac{1}{4}$ x $16\frac{1}{4}$ x $28\frac{1}{4}$	2
AA	Knob****	$1\frac{1}{4}$ dia.	8
Hardware			
BB	Hinge****	2 x $1\frac{1}{4}$	8
CC	Bullet Catch****	$\frac{7}{16}$ dia.	4
DD	Foot	$1\frac{1}{4}$ dia.	4

* Length allows $\frac{1}{8}$ in. space between part and case back, as for a piece built during the driest time of year. Allow at least $\frac{1}{4}$ in. space if building during times of high humidity, to allow for shrinkage in the top/bottom and sides.

** Length includes tenon(s).

*** Raised panels as dimensioned allow $\frac{1}{4}$ in. across width for expansion, as would be appropriate when building during the driest time of year. If building during times of high humidity, panel width should be nearly the full groove-to-groove distance, to allow for expected shrinkage.

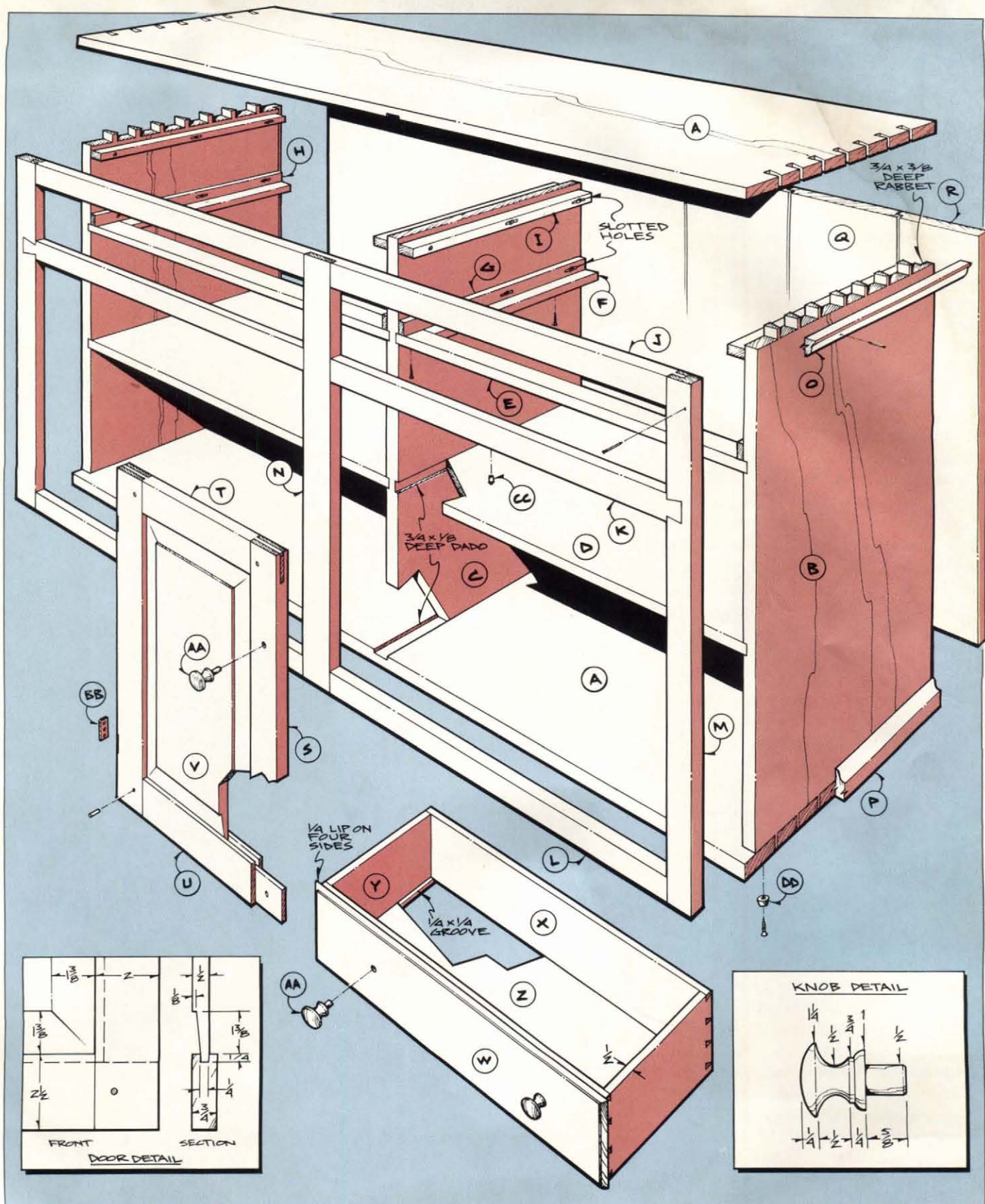
**** Knobs, cabinet hinges and bullet catches available from Woodcraft, 210 Wood County Industrial Park, Parkersburg, WV 26102; tel. 1-800-225-1153. Knobs are part no. 50L51 for a bag of 10 maple knobs, 50R41 for a bag of 10 cherry knobs; hinges are part no. 16Q42 (4 pair required); catches are part no. 16C72.

The Doors

The doors use a simple slip-joint to join the stiles (S) with the top and bottom rails (T, U). The raised panel (V) is housed in a $\frac{1}{4}$ in. deep by $\frac{1}{4}$ in. wide groove. As shown in the door detail, the slip joint is cut so the groove bottom is on the same plane with the inside edge of the rail tenons. As illustrated, the raised panel is cut on the table saw, but the router table and a panel raising bit would be a better choice.

The Drawers

The drawers use traditional half-blind dovetails to join the



drawer front (W) and sides (Y), with through dovetails at the back (X). The bottom (Z) is $\frac{1}{4}$ in. thick plywood, though if you are a stickler for authenticity, bevel-edged solid stock drawer bottoms could also be employed. The drawer knobs (AA) are lathe turned, however a similar knob can be purchased from Woodcraft (see Bill of Materials).

The Hardware

Hardware consists of hinges (BB), bullet catches (CC) to hold the doors closed, and feet (DD) at the four corners to raise the chest slightly off the floor. The feet are available at any hardware store, and sources for the hinges and bullet catches are listed in the Bill of Materials.

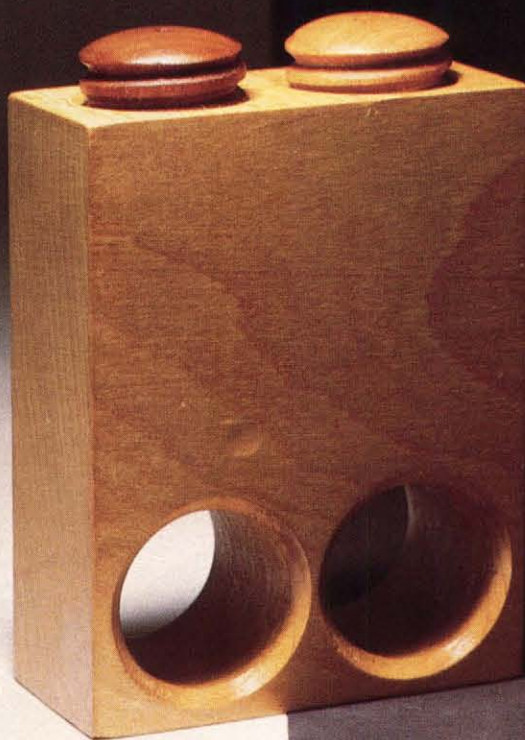
Salt and pepper shakers have traditionally made great gifts. But making them usually involves the purchase of some fairly expensive mechanisms, (especially if you want a mill that will grind peppercorns), and at the very least some stoppers for the bottoms of your shakers. This clever concept, from Bradford Woodworking of Worcester, Pennsylvania, combines the salt and pepper shakers into a single unit. You simply slip your middle and index fingers through the two large holes, and then hold your thumb over the salt or pepper holes, whichever one you don't want. Or leave both the salt and pepper holes open for a shot of combination seasoning. The two hole top is for salt, the single hole for pepper.

Perhaps best of all, these shakers require no hardware at all, not even stoppers. The shakers use threaded tops screwed into a block of wood that's been tapped to accept them. They are made with a matching 1 in. tap and die set. The shaker shown in the photo is maple with tops of cherry and walnut, but other combinations of wood will also work well. Any of the wood threading devices featured in our Special Techniques article (page 25) can be used to make this project.

If you plan on making a number of these, just thread several feet of dowel stock. However, as suggested in Special Techniques, if you aren't turning your own dowel stock, be sure to buy stock that's properly sized and round. Once the dowel stock is threaded, cut it into $7/8$ in. long sections. Then, using a $5/8$ in. diameter Forstner bit, bore a $3/4$ in. deep hole in each of the threaded sections. As shown, a pair of V-blocks and a handscrew will serve to hold the threaded dowel sections while you drill the holes. Be sure to securely clamp the handscrew to the drill press table, so there's no chance of the workpiece wandering.

Drill through the tops of the threaded section with a $1/16$ in. bit, then gently round them, taking care not to sand away too much. It's important that the thickness of the tops be $1/8$ in. or less, since

SALT & PEPPER SHAKER COMBO



A Simple Seasoning Solution

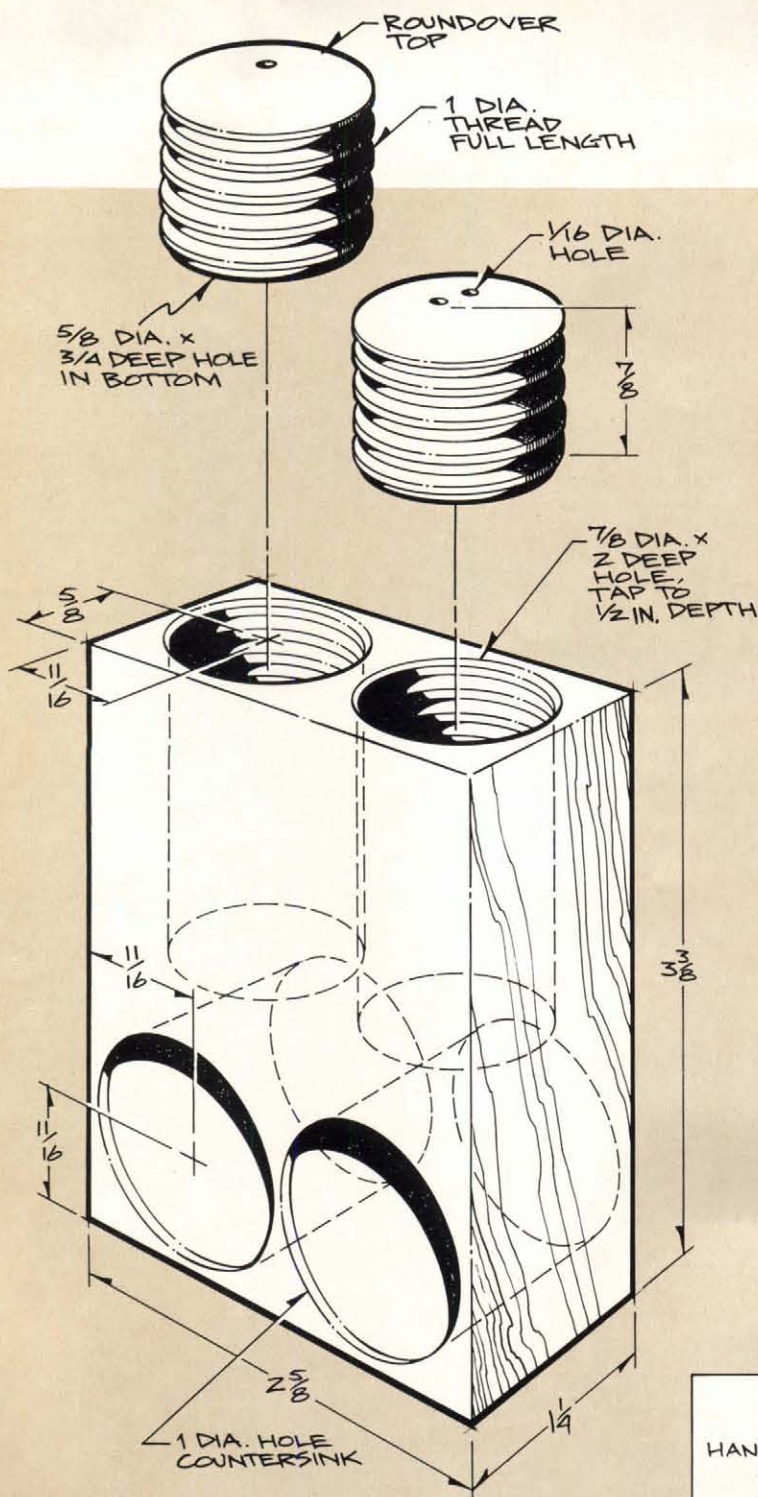
any greater thickness makes it difficult for the salt or pepper to come through the holes.

Next make the block. Start with a block a little longer than the $33/8$ in. shown. Drill a pair of $7/8$ in. diameter by 2 in. deep holes, then use the tap to cut a thread to a depth of about $1/2$ in. Check the fit of the threaded tops into the holes; when bottomed the tops should protrude about $3/8$ in. Since starting the tap often

produces some tearout at the top end of the block, you'll probably need to clean up that end on the disk sander. The little extra on the block length allows for this cleanup. Then just drill a pair of 1 in. diameter finger holes, side-by-side, and countersink to produce a chamfer on the hole edges.

After sanding, use a food-safe penetrating oil, like Preserve Nut Oil, to finish the wood.





Sources

Cherry, walnut, and various other species of dowel stock in a 1 in. diameter are available from:

Constantine's
2050 Eastchester Rd.

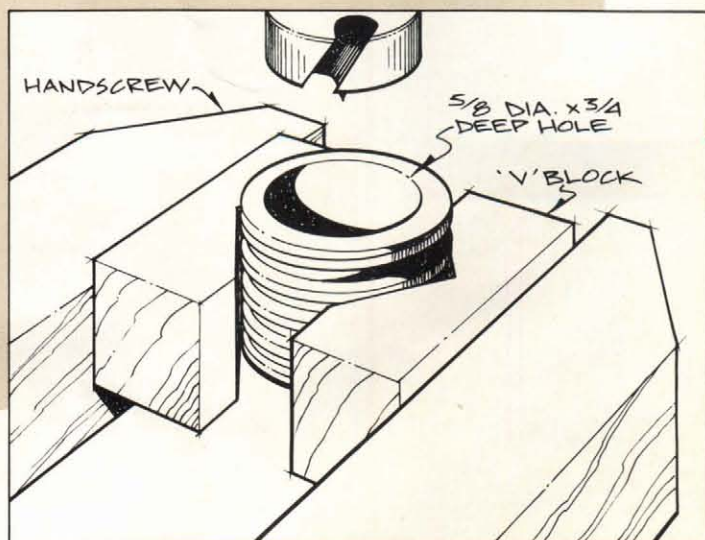
Bronx, NY 10461 Tel. 1-800-223-8087

See Special Techniques article on page 25 for sources of wood threading tap and die sets.

Wood Threading Tips

If you use a threadbox to cut the threaded dowel sections, you may find that after some use the cutter isn't slicing so cleanly through the wood. Remove the cutter and hone lightly on a fine India stone. If after several sharpenings, the cutter just doesn't seem to be working properly, it may no longer be set at the proper angle. Repeatedly taking out and reinserting the cutter in the threadbox can cause the wood under the cutter to compact. Remove the cutter, inspect the seating area for wood compression, and shim under the cutter with veneer to restore the proper angle (this may take several tries).

If the angle is correct, but after a number of sharpenings the cutter still doesn't seem to be cutting well, then it's probably time for a new cutter. If you do a lot of wood threading, keep several spare cutters on hand. But, should you be caught in a pinch, and have to make do with the cutter on hand, you can still usually salvage a rough thread. Inspect the rough thread and you'll find that the chipping or tear-out is usually at the point of the thread. Use some sandpaper to sand the threaded dowel down to remove the damaged points. The threads won't look quite so crisp, but they'll still work just fine.



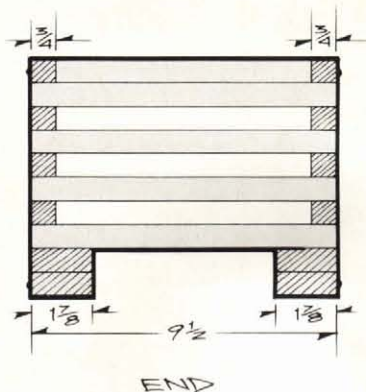
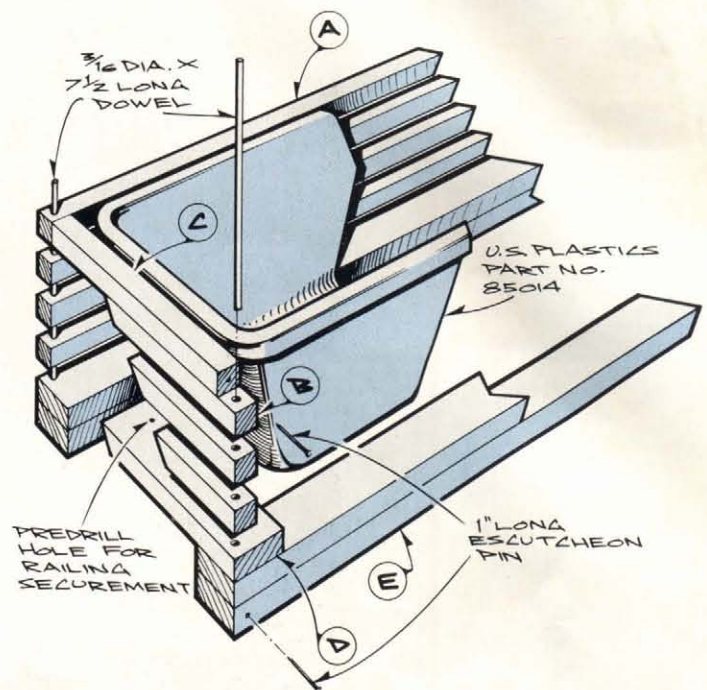
2 Deck Railing Planters



Plants can really spice up a deck, but locating decorative plants on the deck floor is usually not a good idea. They're forever in the way or in danger of being knocked over. The ideal solution to this problem is to locate the plants in railing-mounted planters. We've seen variations of these clever railing-mounted planter boxes in the garden shops, but if you've got a table saw, it's cheaper to make them yourself.

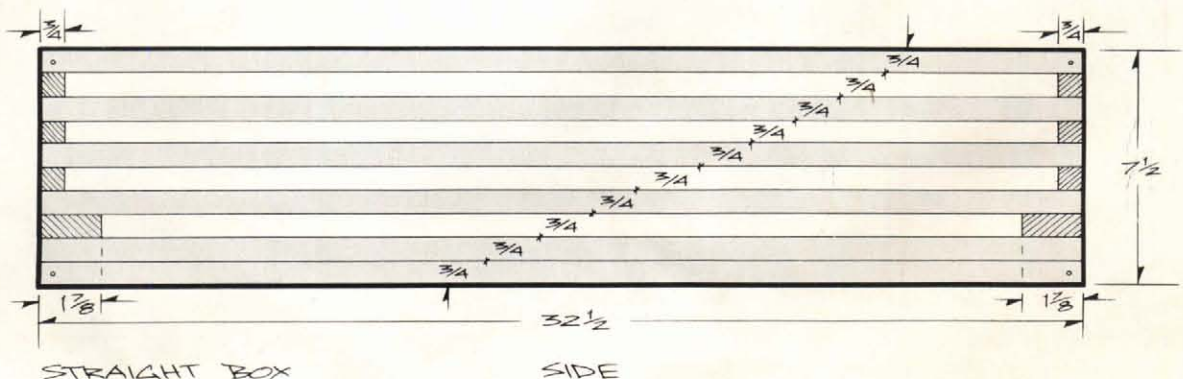
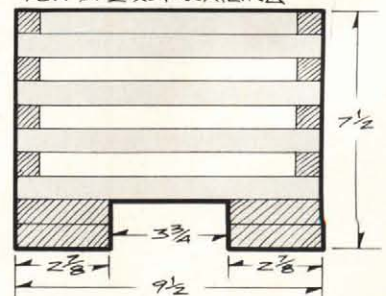
We show two styles of planters: a straight version and a corner version. Both have similar construction, mainly utilizing $\frac{3}{4}$ in. square strips of cedar. Other rot-resistant woods, such as redwood or teak, are also fine for this type of project.

The illustrations show the planters built for mounting on a standard two-by-six deck railing, which measures about $5\frac{1}{2}$ in. wide. As shown, we've allowed an extra $\frac{1}{4}$ in. so the planter fits easily over the railing. The detail shows how to dimension the planter base if your railing is two-by-four instead of two-by-six. However, there are nearly as many deck railing styles as there are decks, so



OPTION FOR 2 X 4 RAILING

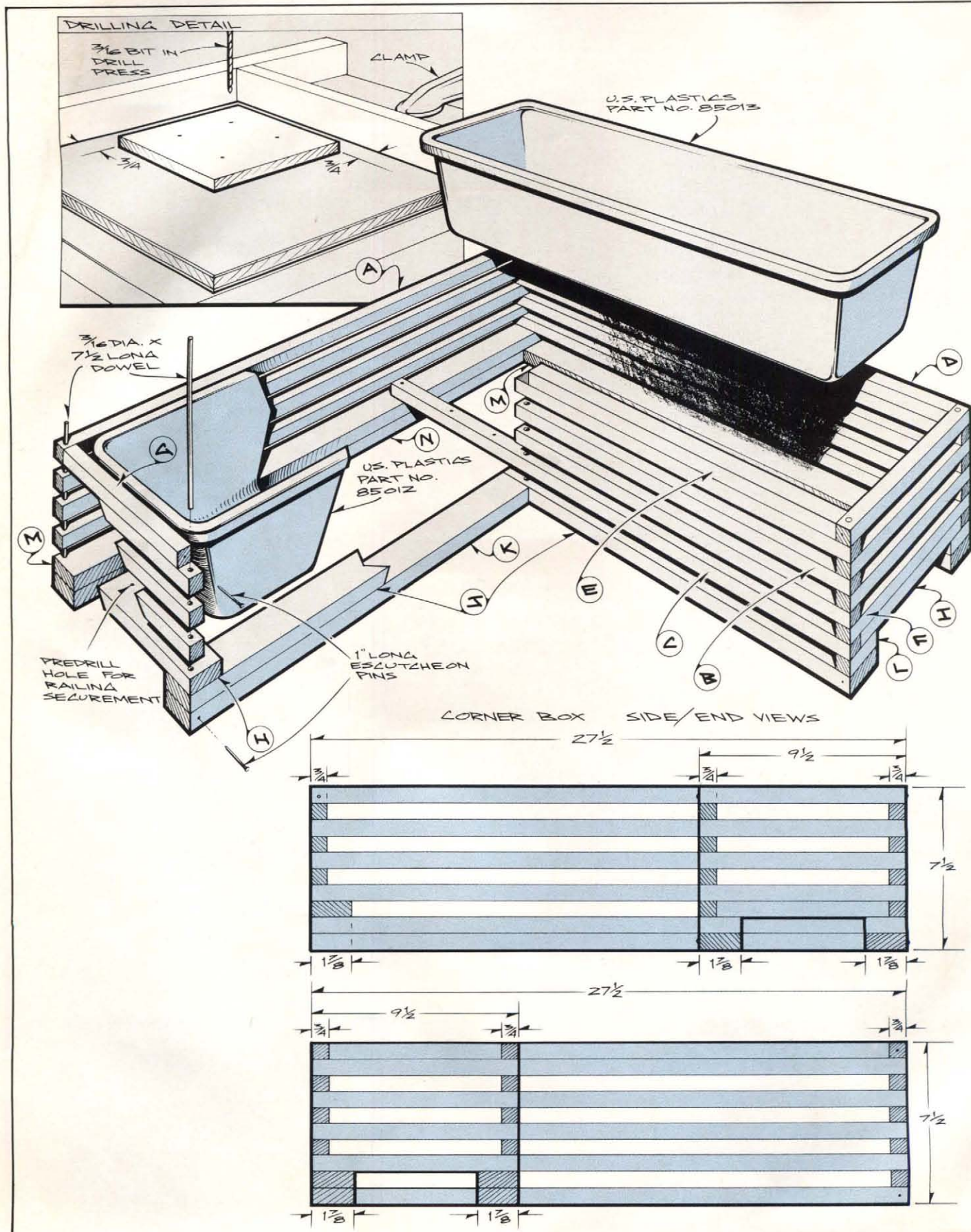
ALTERNATE BASE CONFIGURATION FOR A 2 X 4 RAILING



Bill of Materials

(all dimensions actual)

Part	Description	Size	No. Req'd.
Straight Planter Box			
A	Side	$\frac{3}{4} \times \frac{3}{4} \times 32\frac{1}{2}$	8
B	End	$\frac{3}{4} \times \frac{3}{4} \times 9\frac{1}{2}$	6
C	End Filler	$\frac{3}{4} \times \frac{3}{4} \times 8$	2
D	Base End	$\frac{3}{4} \times 1\frac{7}{8} \times 9\frac{1}{2}$	2
E	Base	$\frac{3}{4} \times 1\frac{7}{8} \times 32\frac{1}{2}$	4



you may need to configure the planter bases to suit your particular situation. Just keep in mind that on the corner planter, any variation in the width of the base parts will mean a corresponding adjustment in the length of many of the base parts. If you'd rather not fuss with adding and subtracting to get the base to fit properly, just cut several scrap pieces to equal the width of your deck railing. Temporarily tack the scrap in place on the bottom of the planter boxes, then cut the base pieces to fit, allowing sufficient clearance on either side so the fit won't be too tight.

To help simplify building the planters, we've provided two separate Bills of Materials. However, the basic construction of both the straight and corner versions is similar. Note that our planters are sized to house the planter trays that we used (see Source for ordering information). These trays are a heavy-duty fiberglass reinforced molded plastic. They are a rigid tray, built to last, and not at all like the thin, easily crushed plastic trays that hot-house plants are often sold in. These heavy duty trays are meant to be planted in, though you could also place standard clay pots inside them. You will need to drill drainage holes in the tray bottoms, if you do plant in them.

Bill of Materials

(all dimensions actual)

Part	Description	Size	No. Req'd.
Corner Planter Box			
A	Long Side	$\frac{3}{4} \times \frac{3}{4} \times 27\frac{1}{2}$	8
B	Short Side	$\frac{3}{4} \times \frac{3}{4} \times 18\frac{3}{4}$	7
C	Cross Strip	$\frac{3}{4} \times \frac{3}{4} \times 26\frac{3}{4}$	1
D	Long Filler	$\frac{3}{4} \times \frac{3}{4} \times 26$	1
E	Short Filler	$\frac{3}{4} \times \frac{3}{4} \times 17\frac{1}{4}$	1
F	End	$\frac{3}{4} \times \frac{3}{4} \times 9\frac{1}{2}$	7
G	End Filler	$\frac{3}{4} \times \frac{3}{4} \times 8$	1
H	Base End	$\frac{3}{4} \times 1\frac{7}{8} \times 9\frac{1}{2}$	1
I	Base End Filler	$\frac{3}{4} \times 1\frac{7}{8} \times 8$	1
J	Short Base	$\frac{3}{4} \times 1\frac{7}{8} \times 19\frac{7}{8}$	2
K	Short Base Filler	$\frac{3}{4} \times 1\frac{7}{8} \times 18$	1
L	Spacer Block	$\frac{3}{4} \times \frac{3}{4} \times 1\frac{7}{8}$	2
M	Long Base	$\frac{3}{4} \times 1\frac{7}{8} \times 27\frac{1}{2}$	2
N	Long Base Filler	$\frac{3}{4} \times 1\frac{7}{8} \times 25\frac{5}{8}$	1

Both the straight and the corner planters are constructed with just two basic sizes of stock: $\frac{3}{4}$ in. square pieces that form the sides and ends, and $\frac{3}{4}$ in. thick by $1\frac{7}{8}$ in. wide pieces that form the base sections. Cut the parts to the lengths listed in the Bills of Materials, then assemble as shown, using $\frac{3}{16}$ in. diameter dowel pins at each corner. A simple drill press jig (see Drilling Detail) will insure that all the dowel pin holes in the $\frac{3}{4}$ in. square strips align properly. For the holes in the base parts, by rubbing a little builder's chalk on the dowel pin ends, and then holding the base parts in position, you'll be able to accurately mark out the various holes in the base parts. No glue is used, but brass escutcheon pins through the dowel pins both top and bottom insure that they won't accidentally slip out. Use galvanized finishing nails to further secure the center area of the base sections that are doubled up, and to fasten the various filler pieces.

Although the construction of the straight planter is identical on both sides, the corner planter is a little fussier. The strips on the outside of the L are longer than the strips on the inside of the L. And, since trays aren't made with mitered ends, one tray had to be longer than the other. Like the straight planter, the base on the shorter tray side is doubled, but on the other leg of the L, a pair of short $\frac{3}{4}$ in. square blocks serve as spacers. This avoids having three solid layers stacked one above the other. Finally, to lend the L shape some stability against racking, one of the strips—called a cross strip—on the inside of the L is longer than the rest, and ties into the base with a galvanized finishing nail, as shown in the exploded view.

Although, once fastened, the cross strip lends the corner planter much needed stability, you'll want to be absolutely certain that the planter is square when this strip is fastened down. Using a carpenter's square, lay out two pieces of scrap to form a right angle on your assembly surface, then tack the

Stock Tip

When buying stock at a local lumberyard for our planters, we found that buying $\frac{3}{4}$ in. thick cedar boards was an expensive way to go. A far less costly option was to buy ship-lapped cedar siding, which is smooth on one side and rough-sawn on the other. At about $\frac{7}{8}$ in. thick, after several passes through the planer our siding was smooth on both sides, and had been reduced to the required $\frac{3}{4}$ in. thickness. A single 10 ft. long one-by-twelve siding board was all that was needed to yield stock for the two planters shown in the photos, with plenty of extra stock left over. Take care to select a board that doesn't have many knots. A knot in a strip that's only $\frac{3}{4}$ in. square isn't recommended.

scrap pieces down temporarily. This simple jig can also be an assembly aid as you lay out and stack the pieces for the straight planter box.

Cedar weathers well, so we opted to leave the wood unfinished on our planters. Although, when filled, the planters should be secure on the railing in the roughest weather, if you live in the Midwest's tornado alley, a few screws through the base ends into the railing will insure that even a storm such as whisked Dorothy away to Oz won't dislodge your planter boxes. 

Source

The heavy duty planter trays that we used are available from United States Plastic Corp., 1390 Neubrecht Rd., Lima, OH 45801; tel. (419) 228-2242. The tray for the straight planter box is their part no. 85014; the two trays for the corner planter box are part no. 85012 for the short tray and part no. 85013 for the longer tray.

K A L I M B A

The Kalimba, or thumb piano as it is also called, is an old African folk instrument. There are many wonderful variations on the Kalimba, including one, as shown in our photo, that was made in Kenya from an old motor oil can.

As the name suggests, it's played with the thumbs, but even if you're all thumbs when it comes to playing music, we think you'll be able to coax a pleasing sound from this instrument. Kids especially enjoy playing it.

Ours is made from cocobolo, with a sitka spruce soundboard, but almost any combination of wood will work. You'll need thin stock for this project: $\frac{1}{8}$ in. thick for the bottom, $\frac{1}{4}$ in. thick for the soundboard, and $\frac{3}{8}$ in. thick for the ends, sides, ring and keyboard.

Begin by thickness planing stock for the various parts. If you don't have a thickness planer, we've listed sources for thin stock in the Bill of Materials.

Cut Parts to Size

Cut the soundboard (A) and bottom (B) to about $6\frac{1}{2}$ in. wide by $8\frac{1}{2}$ in. long. The extra length and width will be trimmed later.

Next, rip stock for the frame parts—the upper end (C), lower end (D) and sides (E)—to $\frac{3}{4}$ in. wide. Once ripped, crosscut the parts to the length dimensions shown in the Bill of Materials.

Make the Frame

As shown in Fig. 1, you'll need to cut a $\frac{3}{8}$ in. wide angled rabbet in each end of the sides. Set up the table saw with a $\frac{3}{8}$ in. dado head, then tilt the dado head to the 5 degree angle shown. Once angled, elevate the dado so that the highest point is $\frac{3}{16}$ in. above the saw table.

Now, with the miter gauge in the slot on the left side of your table saw, pass the end of the stock through the cutter to create the lower rabbet (Step 1). Then, make the same rabbet cut on the other side piece.

Next, move the miter gauge to the slot on the right side of your table saw and cut the upper rabbet (Step 2). Repeat the cut on the other side piece.

The frame parts can now be assembled.

Add a coat of glue to the mating surfaces, then apply clamp pressure. Oily tropical woods like cocobolo can be difficult to glue. You'll get the strongest joint if, just before gluing, you wipe the mating surfaces with acetone.

It's best to glue the parts on a flat work surface (the table saw table will do fine), as it helps keep the edges flush. If necessary, protect the work surface from glue squeeze-out by covering it with wax paper.

When dry, remove the clamps and, if necessary, sand the edges flush (the edges must be flush for the top and bottom to fit properly). If you have one, a sanding board is handy for just such an operation. A sanding board is simply a

piece of 9 by 11 sandpaper that's glued—grit side up—to a flat piece of plywood. Rubber cement is used so the sandpaper can be removed and replaced when it wears out. To use the sanding board, clamp it in place, then move the workpiece back and forth on the paper until the edges are sanded flush.

Make the Keyboard

The keyboard (F) can be made next. Start with a piece of $\frac{3}{8}$ in. thick stock measuring $1\frac{1}{4}$ in. wide and about 12 in. long. You'll only need a 5 in. long piece, but the extra length is needed for safety while cutting the V-groove and dado.

Use the router table and a V-groove cutter to cut a groove for the fret wire (J). The fret wire serves to *elevate the keys*, and since the wire is just slightly over $\frac{1}{16}$ in. diameter, the groove need only be about $\frac{1}{32}$ in. deep. It's best to make a test cut on scrap stock to see how well the wire fits.

The $\frac{1}{8}$ in. deep by $\frac{5}{16}$ in. wide groove is cut on the table saw using the dado head. Once the groove is cut, crosscut the keyboard to its final length of 5 in.

Bore the Holes

It's best to cut the holes in the soundboard and bottom before they're assembled to the frame. If bored after assembly, there's a danger of splintering.

Layout and mark the centerline location of the $1\frac{5}{8}$ in. diameter hole in the soundboard and the two $\frac{1}{2}$ in. diameter holes in the bottom. Keep in mind that the soundboard and bottom were cut oversized, so allow for the frame overhang when you mark the hole centerlines. To minimize splintering when boring the holes, be sure to sandwich the parts between scrap stock.

Next, final sand the keyboard, then glue it to the soundboard. Don't forget to use acetone before gluing. When locating the keyboard, again keep in mind that the soundboard is oversized at this point in the construction.

When dry, bore a pair of $\frac{3}{16}$ in. diameter holes through the keyboard and the soundboard. Use the tubing (I), which has prebored holes, as a template for the proper hole spacing.

Bill of Materials

(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Soundboard*	$\frac{1}{4}$ x $6\frac{1}{2}$ x $8\frac{1}{2}$	1
B	Bottom**	$\frac{1}{8}$ x $6\frac{1}{2}$ x $8\frac{1}{2}$	1
C	Upper End**	$\frac{3}{8}$ x $\frac{3}{4}$ x $5\frac{1}{16}$	1
D	Lower End**	$\frac{3}{8}$ x $\frac{3}{4}$ x $4\frac{1}{8}$	1
E	Side**	$\frac{3}{8}$ x $\frac{3}{4}$ x 8	2
F	Keyboard**	$\frac{3}{8}$ x $1\frac{1}{4}$ x 5	1
G	Ring**	(see detail)	1
H	Keys***		12
I	Tubing***	$\frac{3}{8}$ in. O.D.	1
J	Fret Wire***	$\frac{1}{16}$ in. dia.	1
K	Screw***		2
L	T-nut***		2

* Part A is available from Folkcraft Instruments, Box 807, Winsted, CT 06098; tel. (203) 379-9857. Folkcraft will provide a sitka spruce soundboard measuring $\frac{1}{4}$ in. thick by $6\frac{1}{2}$ in. wide by $8\frac{1}{2}$ in. long (the length and width dimensions allow extra for trimming). Order p/n WWJ-01, current price is \$9.25 postpaid.

** Stock for parts B through G is available from Craftsman Wood Service, 1735 West Cortland Ave., Addison, IL 60101; tel. 1-800-543-9367. They carry $\frac{1}{8}$ and $\frac{3}{8}$ in. thick stock in a variety of imported species. All stock measures at least 3 in. wide and 12 in. long and is sold by the square foot. For $\frac{1}{8}$ in. thick cocobolo order part number W9081 (\$7.98 per square foot), for $\frac{3}{8}$ in. thick cocobolo order p/n W9503 (\$14.35 per square foot). Add \$5.20 shipping and handling for orders between \$15 and \$30.

*** Parts H through L are available as a kit from Musicmaker's Kits, 423 South Main, Dept. J-3, Stillwater, MN 55082; tel. 1-800-432-5487. Order their kit no. HDWE-71. Current price is \$9.95 each plus \$3.50 shipping.

Assemble the Box

Mount the two T-nuts (L) to the back side of the soundboard. We did it by pressing the T-nuts into the holes to get them partially seated, then threading the screws (K) through the tubing and the keyboard and into the nuts. The screws were then tightened until the T-nuts were fully seated. Once the T-nuts are in place, remove the tubing and screws.

The soundboard and bottom can now be added. Add a thin coat of glue to the top and bottom edges of the frame, then locate the soundboard and bottom in their proper positions. Apply clamp pressure all around. When dry, trim the edges flush and round the corners.

Turn The Ring

The cocobolo ring (G) is purely decorative, so you can choose to leave it off, but we find it's a detail that helps add interest to the piece. It's also a good exercise in faceplate turning.

Begin by mounting a 3 in. diameter by $\frac{3}{4}$ in. thick pine disk to a 3 in. diameter faceplate (see Ring Detail). Next, glue a piece of $\frac{3}{8}$ in. thick by 2 in. square ring stock to a piece of $\frac{3}{4}$ in. thick by 2 in. square pine. When dry, scribe a $1\frac{7}{8}$ in. diameter circle on the glued-up pieces and cut out the circle with the band saw. Now, center the glued-up parts on the 3 in. disk and join them with a counter-bored 1 in. long wood screw in the center as shown (the back of our faceplate is open, enabling the screw to be driven without removing the 3 in. disk from the faceplate).

Mount the assembly to the lathe, then turn the glued-up parts to $1\frac{3}{4}$ in. diameter. Once turned, use the parting tool to make the remaining cuts. First, establish the $\frac{1}{16}$ in. deep by $\frac{1}{8}$ in. wide rabbet on the ring, then create the ring's $1\frac{1}{2}$ in. inside diameter. Following this, use 220-grit sandpaper to round over the front of the ring as shown. When rounded to your satisfaction, cut off the ring at the glue line.

Check it for a good fit in the soundboard hole. If tight, use sandpaper to enlarge the hole as needed. When all looks okay, glue the ring in place, taking care to align the grain of both parts.



Apply the Finish

Since the Kalimba is played in your hands, you'll want the surfaces to feel smooth and soft. Use a file to round the corners and edges, then, thoroughly sand the piece, finishing with 220-grit.

For a final finish, apply two or three coats of a good penetrating oil. After the last coat, use a clean cloth to buff the surface to a soft luster. Four adhesive-backed felt disks were added to the underside to help protect the bottom.

Tuning and Playing

Your hardware kit will include 12 keys (H), ranging from long to medium to short. Lay the fret wire in its groove, arrange the keys as shown in the photo—the long keys in the center, shorter keys on the ends—then add the tubing and tighten the screws to slightly tension the keys. The tension must be sufficient to produce a clear tone from each key.

As shown in the Tuning Diagram, to

tune the Kalimba to the diatonic scale, assign each key a number, from 1 to 12. Then fine-tune the Kalimba by ear, moving each key forward or back and listening to the tone. A small notched dowel makes an ideal key pusher to fine-adjust the keys. When properly tuned, the Kalimba should produce a perfect graduated scale of tones, the lowest tone represented by key no. 1, the second lowest by key no. 2, and so on through the twelve keys. Once the keys are properly tuned, an extra turn on the two screws should hold them securely.

Use your thumbs to alternately vibrate keys on the left and right side of the instrument. A light tweak of each key is all that's needed. Of all the musical instruments, the Kalimba is just about the easiest to play. Experiment a little and soon you'll be producing pleasing tunes. Your hardware kit will also include a history of the Kalimba, a sample tune, and information on tuning it to the Pentatonic scale.



Fishing rods don't usually fare very well when stored in closets, garages, basements or attics. Better to keep them in a rack like this, where they can be given a measure of protection. It also makes a handsome display for the living room or den.

Ours holds seven rods, but it could be made somewhat bigger or smaller to adapt to your collection. Because of the length of most fishing rods, they are separated into two parts before being placed in the rack. The two drawers provide a convenient storage area for the reels, while the pegs are handy for hanging other such essentials as a vest, net, and favorite hat. The $\frac{1}{2}$ in. by $\frac{3}{4}$ crossbar shown in the exploded view is optional, should you want to store rods with reels still mounted. Locate the crossbar, and change the rod pocket holes and rod support notches as needed to suit your equipment.

Except for the back and drawer bottoms (which are $\frac{1}{4}$ in. birch plywood), the project is made from $\frac{1}{2}$ in. thick maple. Begin by making the two sides (A). If you are unable to find 9 in. wide stock, you'll need to edge join a couple of boards in order to get the needed width.

Note that three $\frac{1}{4}$ in. deep by $\frac{1}{2}$ in. wide dados are cut in each side. The two lower dados are cut completely across the width of the sides, while the upper dado is stopped 3 in. from the back edge.

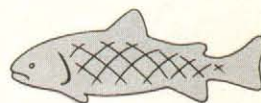
The dados are cut with a router. To simplify the procedure, it helps to clamp the sides, edge to edge, as shown in the Dado Detail. Equip the router with a $\frac{1}{2}$ in. diameter bit set for a $\frac{1}{8}$ in. depth of cut, and clamp a straightedge across the two sides as shown. Make the $\frac{1}{8}$ in. deep cut, then lower the bit to $\frac{1}{4}$ in. and make a second pass. Cutting the dado in two passes helps reduce strain on the router while minimizing burning. (Since the router leaves rounded corners, you'll need to square the ends of the stopped dado with a chisel.)

With the dados completed, use the table saw and a dado head cutter to cut the $\frac{1}{4}$ in. deep by $\frac{1}{4}$ in. wide rabbet along the back edge of each side as shown. Then, transfer the curves from the grid pattern to the sides and cut them out with a band saw or saber saw. Smooth the bandsawn edges with a file and sandpaper.

March/April 1992



Fishing Rod Rack



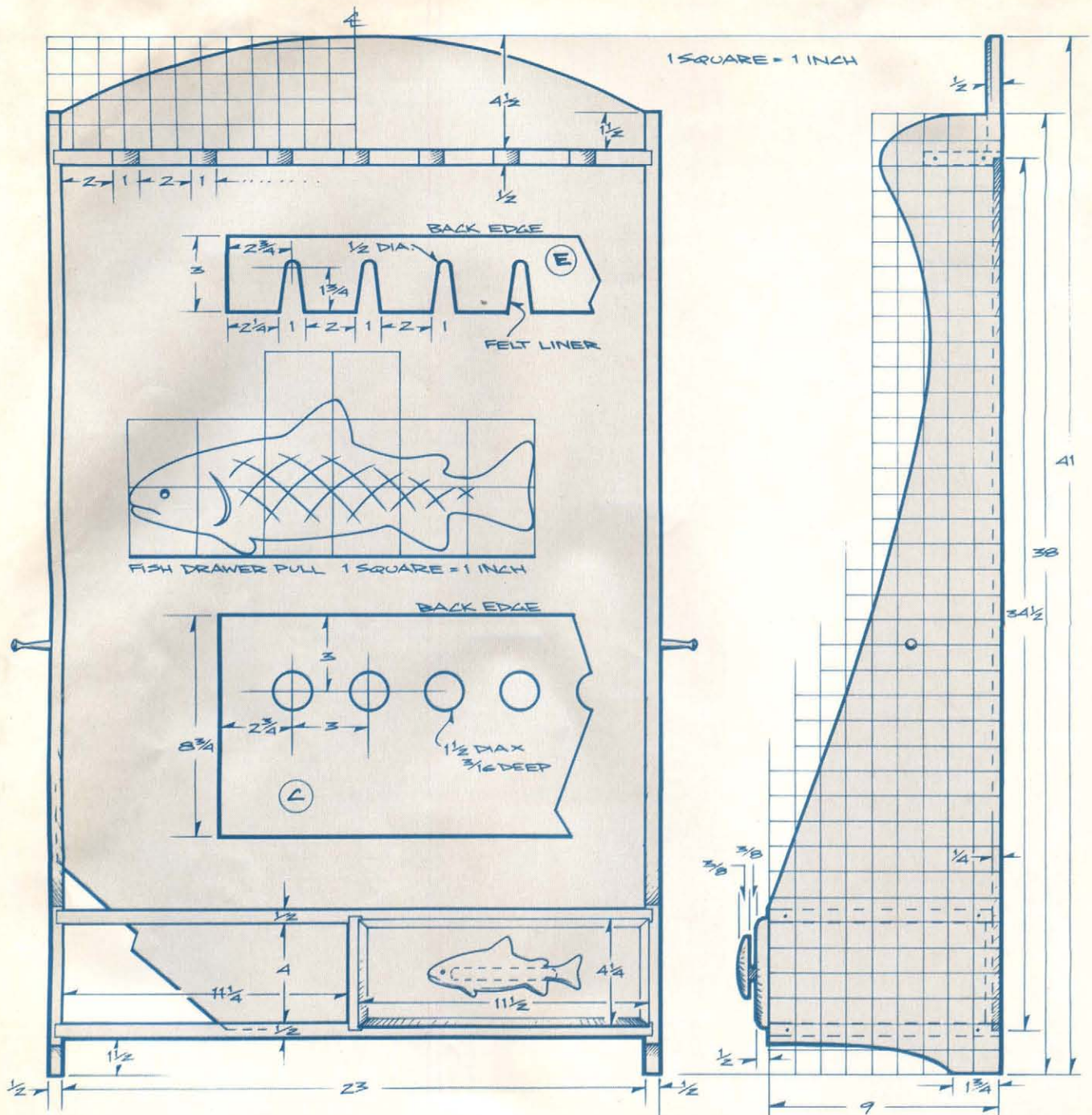
Next, cut the bottom (B), shelf (C), divider (D) and rod support (E) to size. As shown in the exploded view and the detail, there are seven rod handle holes bored in the shelf. Lay out and mark the location of each one, then use a $1\frac{1}{2}$ in. diameter Forstner bit to bore each hole to a depth of $\frac{3}{16}$ in. And as mentioned earlier, it's a good idea to check your rod collection at this point to make sure things will fit okay.

Note that there is a $\frac{1}{4}$ in. deep by $\frac{1}{2}$ in. wide dado cut in the bottom and shelf to accept the divider (D). These cuts can

be made with the table saw and dado head, using the miter gauge to support the stock as it is passed over the cutter. When completed, use the dado head along with the rip fence to cut a $\frac{1}{4}$ in. by $\frac{1}{4}$ in. rabbet in the back edge of the bottom and the rod support.

Lay out and mark the location of the seven notches in the rod support (see detail). Bore a $\frac{1}{2}$ in. diameter hole to establish the end of each notch, then use the band or saber saw to cut the taper.

Now, temporarily clamp the sides, bottom, shelf and divider. Cut the upper



back (F) to size, then cut the $\frac{1}{4}$ in. by $\frac{1}{4}$ in. rabbets on each end (see Rabbet Detail). Transfer the curve from the grid pattern to the stock and cut it out on the band saw. Once cut, smooth the edge and check for a good fit where the curve meets the top end of the sides.

Next, measure the opening for the lower back (G) and cut it to fit. Make sure the four corners are square.

The fishing rack is now ready for assembly. First though, give each part a thorough sanding, finishing with 220-grit. Begin assembly by joining the bottom and shelf to the divider. Use glue and two or three countersunk finishing nails to secure the parts.

The bottom/shelf/divider sub-assembly can now be joined to the two sides along with the rod support. Once again use glue and countersunk finishing nails. If all looks okay, add the upper and lower backs in the same manner.

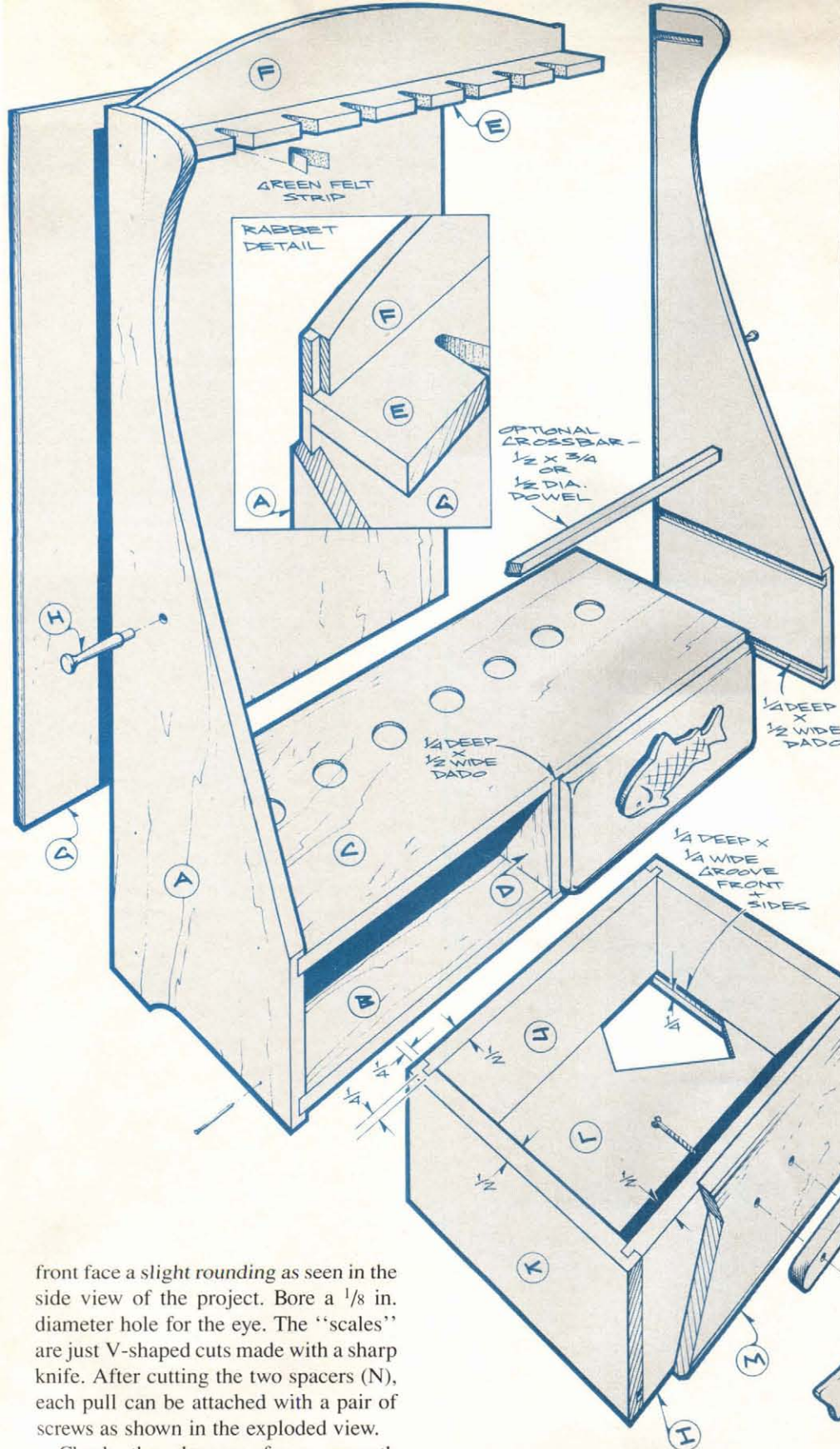
Bore a hole in each side, then add the two pegs (H). Any small peg will do, although we used one of those small Shaker-style pegs sold by most lumberyards.

The two drawers are made next. The front (I), back (J), sides (K) and face (M) are made from $\frac{1}{2}$ in. thick stock, while the bottom (L) is made from $\frac{1}{4}$ in. thick plywood. Cut the necessary rabbets, dadoes and grooves in the front, back

and sides, then assemble with glue and clamps. Slide the bottom in place and secure it with two or three screws driven through the bottom and up into the lower edge of the drawer back.

Cut the drawer faces to size and round the edges with a $\frac{1}{4}$ in. radius round-over bit. Use a pair of wood screws to attach each face to the drawer front as shown in the exploded view.

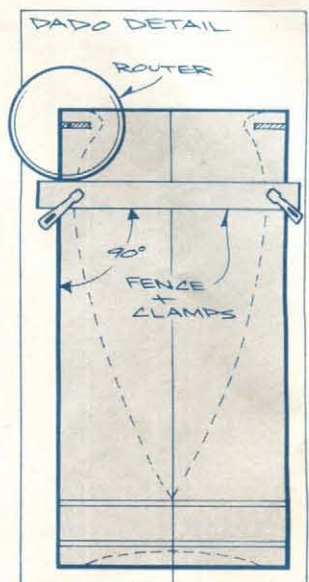
Any kind of drawer pull (O) will work fine here, but we thought a fish-shaped pull was most appropriate. It's easy to make. First, cut $\frac{3}{8}$ in. thick stock to $2\frac{1}{4}$ in. wide by 6 in. long, then transfer the fish pattern and cut it out with a band saw or scroll saw. Use a file to give the



Bill of Materials

(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Side	1/2 x 9 x 38	2
B	Bottom	1/2 x 9 x 23 1/2	1
C	Shelf	1/2 x 8 3/4 x 23 1/2	1
D	Divider	1/2 x 8 3/4 x 4 1/2	1
E	Rod Support	1/2 x 3 x 23 1/2	1
F	Upper Back	1/2 x 4 1/2 x 23 1/2	1
G	Lower Back	1/4 x 23 1/2 x 34 1/2	1
H	Peg	1/2 dia. x 1 1/2 long	2
I	Drawer Front	1/2 x 4 x 10 3/4	2
J	Drawer Back	1/2 x 3 1/2 x 10 3/4	2
K	Drawer Side	1/2 x 4 x 8 1/2	4
L	Drawer Bottom	1/4 x 8 1/4 x 10 3/4	2
M	Drawer Face	1/2 x 4 1/4 x 11 1/2	2
N	Spacer	3/8 x 1/2 x 4 1/4	2
O	Pull	(see detail)	2



front face a slight rounding as seen in the side view of the project. Bore a 1/8 in. diameter hole for the eye. The "scales" are just V-shaped cuts made with a sharp knife. After cutting the two spacers (N), each pull can be attached with a pair of screws as shown in the exploded view.

Check the drawers for a smooth sliding fit. If all looks okay, give the entire project a thorough final sanding. Lightly round over any sharp corners or edges.

Next, we applied two coats of Minwax's Puritan Pine Wood Finish. When

dry we added two coats of satin polyurethane varnish. A strip of felt glued to each rod support notch helps protect the rods.

The fishing rod rack can be mounted by driving four screws through the lower

back. To insure adequate strength, use wall anchors or space the holes 16 in. apart and drive the screws into wall studs. Only two of the screws will show if you locate the two bottom holes behind the drawers.

Shopmade Handscrews

Old-style clamps are a pleasure to use

We'll often marvel at the exquisite workmanship on antique furniture, but do we appreciate just what went into the creation of such work, without benefit of any power tools? It's hard to imagine how complex moldings, delicate joinery, and perfectly flat surfaces could be achieved without a power planer, jointer, router and table saw. Yet craftsmen of old had hand saws, smoothing and jointing planes, molding planes, and a host of other hand tools that did all this and more.

Actually, most of our hand tools really haven't changed all that much, and clamps are a good example of this. The standard steel spindle handscrew clamps that can be found in most shops today are just a further refinement of the basic wooden handscrew. Pivoting steel nuts and threaded steel rods have replaced the old wooden threaded rods that fit through matching holes tapped through the clamp jaw. But except for the fact that the old handscrews don't have the angle clamping capacity of the modern version, in parallel clamping function, both clamps work quite well.

The clamps shown are a copy of a 19th century clamp made by the Bliss Manufacturing Company in Pawtucket, Rhode Island. However, where the Bliss clamp was made of a local hardwood, and featured one-piece lathe-turned dowels with integral handles, we've used a combination of cherry and curly maple, and utilized dowel stock with octagonal shaped handles that are glued onto the threaded dowel rods. The $\frac{3}{16}$ in. bead on the top edge of the clamp jaws is strictly a decorative element.

You could turn the handles and dowels from a single piece of wood, if you happen to own a lathe, but by using the dowel stock with an applied handle construction system, much of the fussiness of making handscrews is eliminated. The dowel stock that we used is cherry and birch, purchased from Constantine's

(tel. 1-800-223-8087), but you may want to buy dowel stock from the same source as your tap and die set. For an overview of the various wood threading systems, how they work, and where both they and the dowel stock can be purchased, see Special Techniques on page 25.

Tips

When starting your threads, the tap has a tendency to lift the grain at the surface, often producing a little tear-out. You can add a chamfer around the entrance perimeter to clear away some of this roughness, or just sand the top surface down a bit.

Like any machine screw thread, the tap will cut the same thread no matter which end of the hole it's started from, so don't worry about a right or wrong way to run the tap.

When using the threadbox to cut threads, starting the threads is often the most difficult part. If you seem to be having trouble starting the threads by turning the threadbox with the dowel clamped securely, try holding both the dowel and the threadbox in your hands, and turn the dowel into the threadbox. Don't continue to apply downward pressure once the threads are started. The threadbox will automatically advance the dowel.

Once your threads are started, you may find it easiest to clamp the dowel with a simple shopmade jig. It's just a length of scrap stock drilled through lengthwise to the dowel diameter, with a kerf cut along the center of one side. Slide the dowel into the jig, then clamp securely in the bench vise as shown in the photo. The jig easily holds the dowel securely and also prevents the vise from deforming the dowel out of round. For more tips on using threadboxes, see page 43.

Making The Jaws

Start by making the clamp jaws. We show two versions, one a sandwich of curly maple around cherry; the second a sandwich of cherry around curly maple. You could use a single $2\frac{1}{4}$ in. thick board for the jaws, but $\frac{3}{4}$ in. stock is more easily obtained. A sandwich of three layers yields the required $2\frac{1}{4}$ in. thickness. Once your lamination is out of clamps, cut the jaws to their $2\frac{1}{4}$ in. width and 16 in. length, and establish the 30 degree taper on the business end of the clamp jaws, as indicated. Then use the router and a $\frac{3}{16}$ in. beading bit to apply the decorative bead on the outside face of the jaws, and a chamfering cutter to apply the $\frac{1}{8}$ in. chamfer around the inside face.

Now lay out the various hole locations. Note that alignment of the holes in the jaws is essential for the clamps to work properly. The holes in the top jaw section are both tapped. Drill through with a $\frac{7}{8}$ in. diameter brad point or Forstner bit, then use the tap to cut threads through the full length of each hole. Lubricate the wood liberally and back the tap off periodically to clear the chips.

The holes in the bottom jaw are not threaded. The frontmost 1 in. diameter hole goes entirely through, but the $\frac{3}{4}$ in. diameter back hole is drilled from the inside face and only extends $\frac{7}{8}$ in. deep, forming a neat little pocket for the clear (no threads) section on the bottom end of the back dowel.

Threading The Dowels

Carefully select your best lengths of dowel rod, then cut two lengths of about 18 in. each. A single 36 in. dowel is enough for one clamp. The 18 in. length allows a little over an inch for starting the threads, an area that often suffers from some chipout. Once the threads are complete, trim the excess off. On the back dowel, stop threading $2\frac{1}{2}$ in. from



the handle end of the dowel, trim the opposite end to establish the $16\frac{3}{4}$ in. dowel length, then file away the threads at that end to leave a clear section $\frac{3}{4}$ in. diameter by $\frac{7}{8}$ in. long.

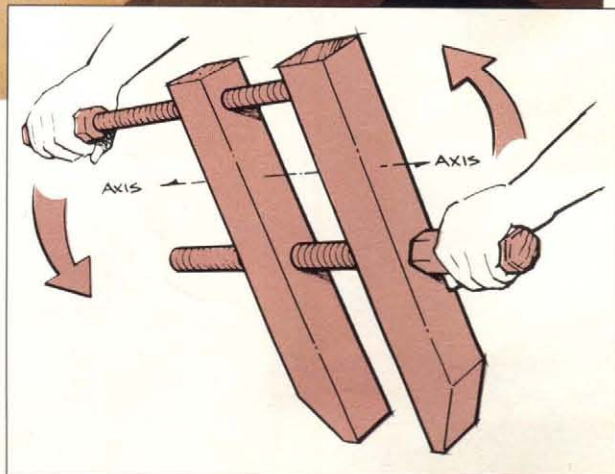
For the front dowel, run the threads to a point $4\frac{1}{2}$ in. from the handle end of the dowel, then trim the opposite end to establish the $16\frac{3}{4}$ in. dowel length. Test your dowels in the clamp jaws to make certain they turn smoothly and the threads don't bind.

Making The Handles

The handles on the two clamps shown are cherry. Cut a length of stock $1\frac{1}{2}$ in. square by about 10 in. long. If you don't have $1\frac{1}{2}$ in. thick stock, just laminate two pieces of $\frac{3}{4}$ in. stock to achieve the required thickness. Then tilt the table

saw blade over to 45 degrees, and rip off the four corners of your $1\frac{1}{2}$ in. square handle stock. Your stock should now be an octagon (be sure to check your rip fence setting by running a piece of $1\frac{1}{2}$ in. square scrap through the saw first, before you actually make the cuts on your handle stock).

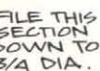
Now crosscut the handle stock to make a pair of $4\frac{1}{2}$ in. long handles. Move to the drill press, clamp the handles securely (one at a time) and drill a 1 in. diameter by $2\frac{1}{2}$ in. deep hole in the end of each handle. Chamfer the handle ends, but don't apply the chamfer



to the inside end of the front handle. Then use a generous amount of epoxy to glue the handles onto the unthreaded ends of the dowel rods. The handle with the chamfer free end is glued to the frontmost dowel; the chamfer is left off since this end of the handle is the bearing surface when the handles are tightened.

Quick adjusting the clamps is a fairly easy task—just grasp both handles as shown, then use a paddling motion to loosen or tighten (see detail on page 55). Once your handscrew is securely in place on whatever is being clamped, maximum clamp pressure is applied by turning the back handle to slightly spread the back of the jaws. This creates a fulcrum action around the front dowel, producing considerable pressure at the front of the jaws.

Once the epoxy has dried, you can assemble and use the clamps. We rubbed on an oil finish to bring up the beauty of our clamps. Some graphite on the threads was the traditional favorite for lubrication. Graphite tends to fill any open pores and reduce friction.





Contemporary Table

Wedged through tenons and butterfly inlays yield an elegant look

This elegant little end table, fashioned mainly of ash and walnut, is an ideal way to show off an especially fine board. The table, by Pennsylvania woodworker Tom Noone, has something of a sculptural look. The design intent is focused toward the top (A), which is the perfect spot to showcase a special board. That richly figured walnut crotch that you've been saving, or perhaps a handsome redwood burl or

some other prized board that's gathering dust in the corner, might just find a home with this design.

But there's more here than just the top. Butterfly inlays and wedged tenons are two other little details that add to the gemlike quality of this piece. Don't feel that you must be tied into the sizes listed in the Bill of Materials. If the board you'd like to showcase is four or five feet long, and you'd prefer a coffee table

to an end table, just shorten the legs and lengthen the stretchers. By adjusting parts sizes, the same general construction theme can be used for a variety of table styles.

The Top

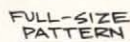
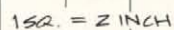
Logically, with this project you'll want to start with the top. If that prized board you'd like to use for this project is slightly over or undersized, now—and not after the table is built—is the time to make adjustments. The table in the photo has a top that's cut from a single 16³/₄ in. wide board, which yields the most pleasing look. If necessary, you can cut the two halves of the top consecutively from a board that's about 9 in. wide. Just try to match the color and grain closely. The butterfly dovetail wedges (B) that join the two halves of the top are both a structural and a decorative element. They tie the two halves together while maintaining the 3/8 in. space between them.

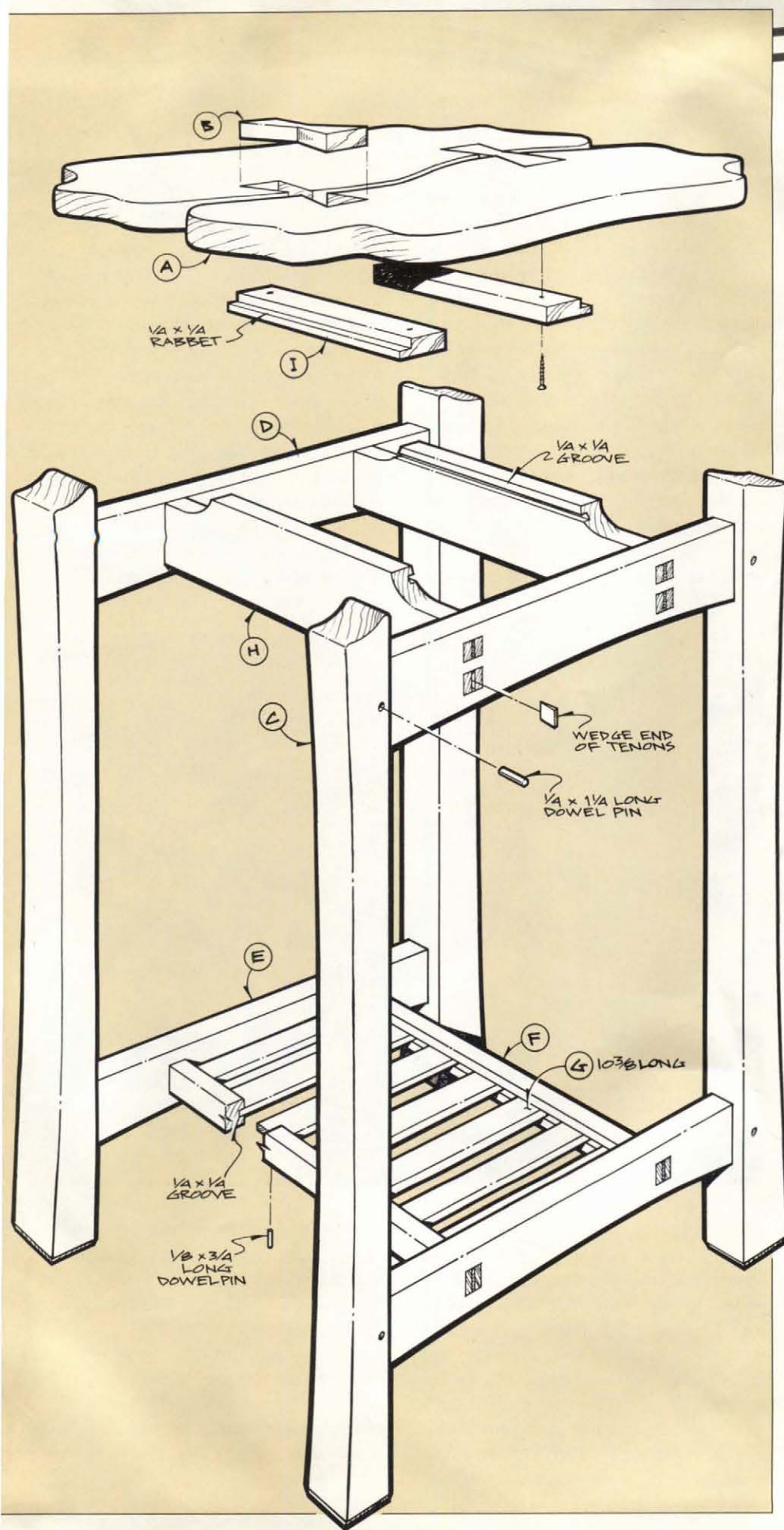
Here's how to cut the top from a single wide



(all dimensions actual)

** Length includes tenons.





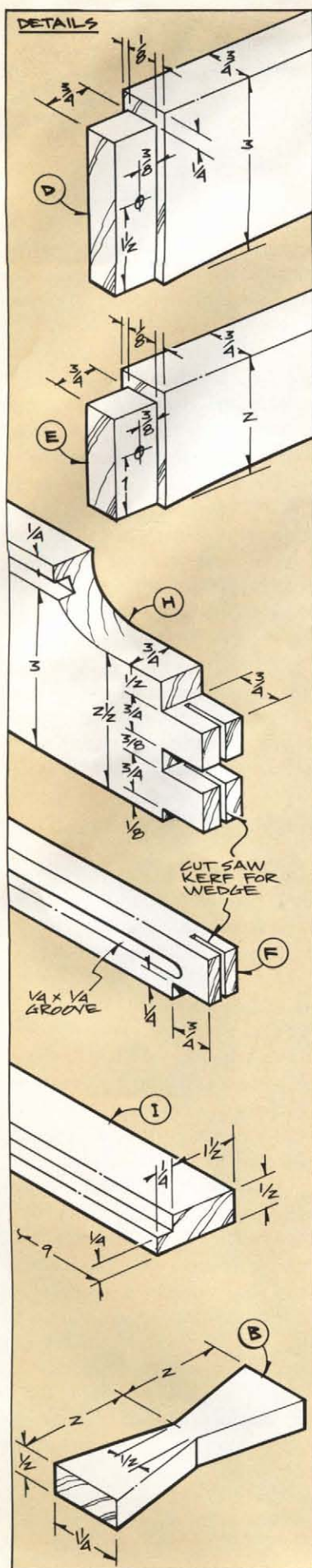
of the top together with the strips between; the three $\frac{1}{8}$ in. strips will maintain the $\frac{3}{8}$ in. spacing between the two halves while the butterfly mortises are cut.

Make the curly maple butterfly inlays (see Details), then lay out and cut the matching mortises. You can scribe the mortises using a sharp knife. Use a router and a straight cutter to waste away most of the stock to a $\frac{1}{2}$ in. depth, but stay well off the scribed line. Then use a sharp chisel to pare back to the line and to clean into the corners, testing the butterfly periodically for fit. Once both inlays and their matching mortises are cut, you can unclamp the sandwich and remove the $\frac{1}{8}$ in. strips. Use the band saw or jigsaw to cut the outside profile of the two halves of the top, sand smooth, then glue the butterflies in place to complete the top. A little final sanding may be needed to make certain the butterfly inlays are perfectly flush.

The Table

The table itself is a fairly straightforward construction. Don't let the leg curve or the curves and profiles on the various stretchers fool you; in all cases the parts are shaped after the mortise and tenon work is complete. Lay out for the mortises in the legs (C), and cut the tenons on the ends of the top and bottom stretchers (D, E). As shown in the Details, the tenons have shoulders on the sides and top, but are flush with the bottom edges of the stretchers. Also cut the shelf supports (F), shelf slats (G) and cross stretchers (H). Cut a $\frac{1}{4}$ in. deep by $\frac{1}{4}$ in. wide groove on the cross stretchers as shown to fit matching tongues on the edges of the cleats (I). Use the router table with a $\frac{1}{4}$ in. diameter straight cutter to establish the $\frac{1}{4}$ in. deep by $\frac{1}{4}$ in. wide stopped groove in the shelf supports for the shelf slats. You may need several passes, raising the router bit about $\frac{1}{8}$ in. at a time, to cut the full $\frac{1}{4}$ in. groove depth.

Once all the joinery has been cut and test fit, establish the curves and profiles on the legs and stretchers. For the legs,



rough in a gentle curve with the band-saw, then smooth with files and sandpaper. A long thin strip of wood, bent around a brad located 1 in. from the inside edge of the leg, and about midway between the top and bottom ends, is an easy way to scribe the gentle curve. Use this same technique to scribe the curves on the top and bottom stretchers. A compass is used to scribe the 1 in. radius curves on the cross stretchers. You can freehand the profile on the leg ends, or transfer the exact profile using the full-size pattern provided. A few minutes with a block plane will quickly yield the 1/4 in. chamfer on the bottom end of the legs.

cross stretcher tenons, as shown.

Cut walnut wedges to fit the kerfs snugly, dip the wedges in glue, and insert. The wedges should be 3/4 in. wide by about 1 in. long, but tapered so they fit snugly when inserted about 5/8 in. deep into the kerf. This insures that they won't bottom out before the kerf is filled. When the glue has dried, the excess length is cut off and the ends sanded smooth. The 1/4 in. diameter by 1 in. long dowel pins anchoring the stretcher tenons to the legs are also walnut.

Turn the table upside down, space the slats about 7/8 in. apart, and anchor each slat with a pair of 1/8 in. diameter by 3/4



Assembly

Once all the curves have been cut and sanded smooth, start the assembly. First make two subassemblies, each consisting of a pair of legs joined by a top and bottom stretcher. Then join the two leg/stretcher subassemblies by adding the shelf supports (the slats must already be in place) and the cross stretchers. First, though, use a sharp handsaw to cut a wedge kerf in the shelf support and

in. long dowel pins inserted through the shelf support bottom edges. A hand drill will easily drill the holes.

All that's left is to mount the top and apply a finish. Center the top, then use a few screws up through the cleats and into the top to anchor it securely. A hand-rubbed oil finish, topped with a coat of paste wax will yield the soft luster that shows this piece to best advantage.



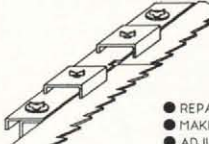
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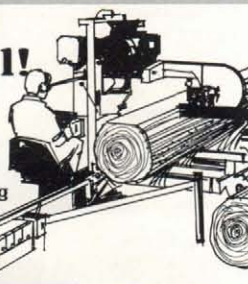
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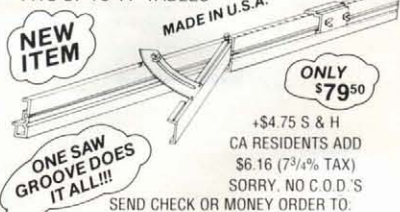
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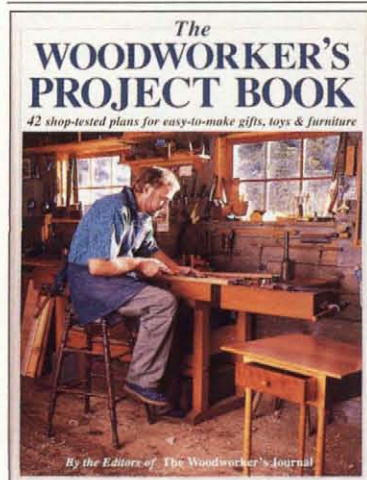
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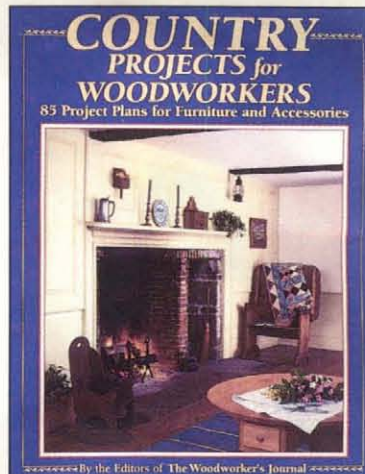
The Woodworker's Journal

You'll find the order form for these books bound in this issue — or for faster service call toll-free 1-800-223-2425!



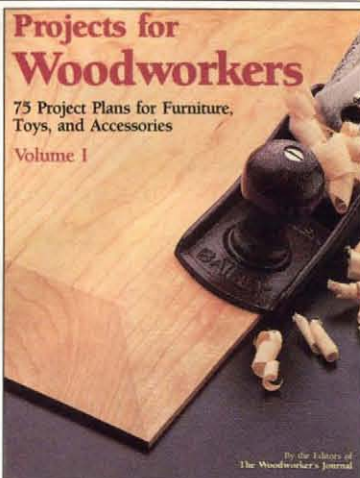
NEW BOOK!

The Woodworker's Project Book
Our first full-color book, these are 42 of our very best, easy-to-make projects. Gleaned from the 1988 issues of *The Woodworker's Journal*, projects include folk-art silhouettes, lamps, pierced-tin cabinets, toys, furniture, decorative woodcrafts, gifts and accessories. Full-size patterns, step-by-step instructions, 74 photos, and over 265 illustrations.



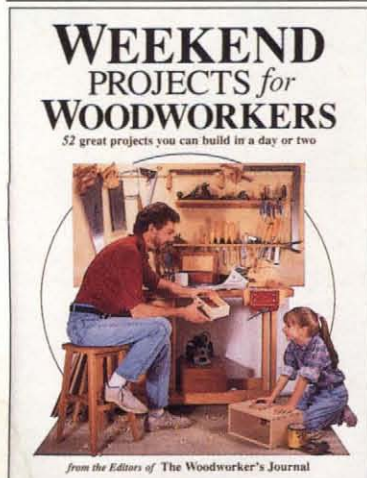
Country Projects For Woodworkers

If building the simple, sturdy furniture of the old cabinetmakers appeals to you, then you'll want this collection of country projects from the 1980-84 issues of *The Woodworker's Journal*. 85 complete plans range from projects like Colonial Candlesticks and Fireplace Bellows to more challenging projects such as a Shaker Chest, a Stepped-Back Hutch, and an 18th Century Trestle Table. Some plans are also in *Projects for Woodworkers*, Volumes 1 and 2.



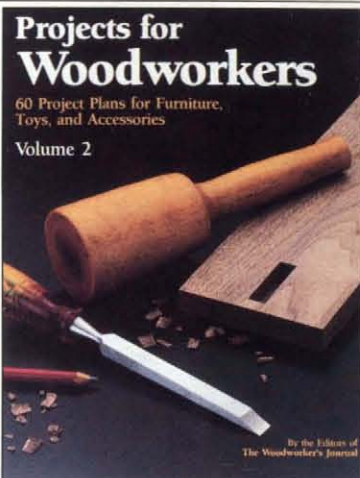
Projects For Woodworkers, Volume 1

Beginning and advanced woodworkers alike will appreciate the full range of styles in furniture, accessories, lamps, clocks, toys and gifts. Of the 75 projects selected from the 1980-81 issues of *The Woodworker's Journal* magazine, plans include a Cabinetmaker's Workbench, Pine Shaker Cupboard, Old-time Icebox, a Cobbler's Bench Coffee Table and a Child's Victorian Sled. Fully detailed instructions, illustrations, and photos.



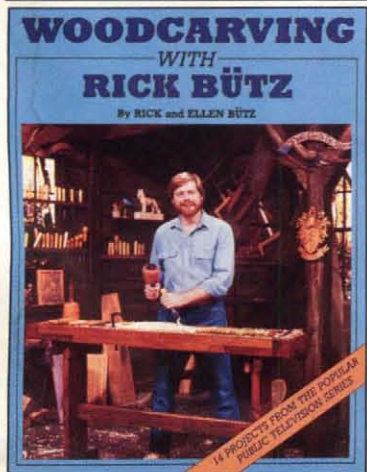
Weekend Projects For Woodworkers

This is the book for the craftsman long on enthusiasm and short on time. Selected from the 1986-87 issues of *The Woodworker's Journal*, all 52 projects are quick, easy and attractive. Each plan is presented clearly with fully detailed instructions and drawings. Whether scrambling for a break or enjoying lots of spare time, woodworkers of all skill levels will appreciate the satisfaction of seeing a project through to completion in just an evening or weekend.



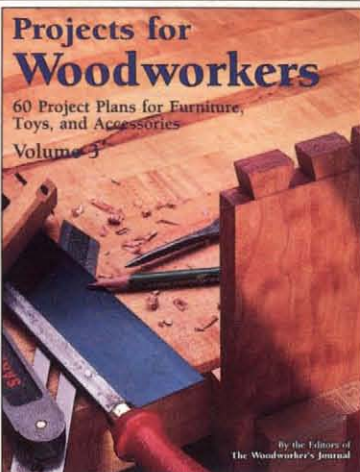
Projects For Woodworkers, Volume 2

Originally published in the 1982 issues of *The Woodworker's Journal* magazine, all 60 projects were chosen with a variety of styles and skill levels in mind. Each project has complete instructions and illustrations. You'll find household accessories like the Desk Caddy, Casserole Dish Holder, and Breakfast Tray easy to build. And you're sure to enjoy completing more involved projects like the Tambour Desk, Old Danish Chest of Drawers and Swinging Cradle.



Woodcarving With Rick Butz

With just a few tools and a few hours to spare, you can share in the pleasures of carving. Wander into the Black Forest of Germany with a carving of St. Nick, or into a Russian village with a Dancing Bears folk toy. Enjoy a chip-carved Quilt Rack, wildlife carvings, and a Tobacconist's Indian. All 14 projects are fully detailed with step-by-step photos. There are chapters on tool selection, sharpening, whittling, chip and relief carving.



Projects For Woodworkers, Volume 3

The best projects from the 1983 issues of *The Woodworker's Journal* magazine—toys, lamps, cupboards, chests, cabinets, tables, planters, mirrors, and much more. Clear illustrations and thorough written instructions make each project easy-to-understand and fun to build. A book you'll want to keep within easy reach of your workbench.

Back Issues

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

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

**Shaker Bench
July/Aug '89**



Whatnot Shelf; *Articles:* Toymaker Clare Maginley; How to Flatten a Warped Board; Choosing Your First Router; Supported Steam Bending.

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

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

Vol. 10 No. 6 Nov-Dec '86 Cube Table, Rabbit Pull Toy, Old-Time Sled Wall Shelf, Cassette Holder, Dog/Cat Bed, Vanity Mirror, Early American Washstand, Router Table, Victorian Sleigh, Early American Hamper; *Articles:* Wholesale and Discount Sources of Supply; Sandpaper Abrasives; Using the Router Table; The Mitered Bead Frame and Panel.

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

Vol. 11 No. 2 Mar-Apr '87 Garden Bench and Table, Mirrored Wall Shelf, Rhombohedron Puzzle, Wood Sawyer Whirligig, Folk Art Door Stop, Kangaroo Pull Toy, Colonial Wall Shelf, Contemporary Hall Table, Shaker Sewing Desk; *Articles:* How to Create a Direct Mail Promotion; Types of Finish; The Mortise and Tenon, Part II; Bevel-Edged Drawer Bottoms.

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

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

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

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

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

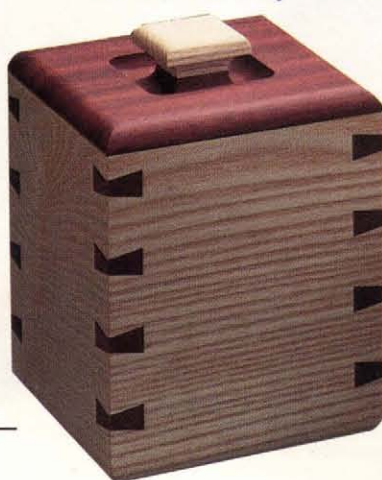
Vol. 12 No. 2 Mar-Apr '88 Oak & Glass Tier Table, Crystal Regulator Clock, Early American Candlesticks, Arrow Wall Decoration, Three-Drawer Country Wall Box, Key Cabinet, Contemporary Box, Shaker Carrier, Folk Harp; *Articles:* Use and Sharpening of the Hand Scraper; The Lathe: Basic Setup; Quartered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

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

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

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

Canister Set May/June '87



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

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

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

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

Vanity Mirror July/Aug '87



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

Vol. 13 No. 5 Sept-Oct '89 Country Bake-Room Table, Chippendale Small Chest, Stacking Desk Trays, Pencil Box, Apple Doorstop, Space Shuttle Toy, Marquetry Coasters, Ice Chest with Marbleized Top, Globe Stand; *Articles:* Table Saw Basics; Cutting Full-Blind Dove-

etails; Marquetry: The Pad Method; Marbleizing; Mount Lebanon Shaker Village: A Museum in the Making; Tool Review: Four Portable Planers.

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

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

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

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

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

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

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

Vol. 15 No. 1 Jan-Feb 1990 Santa Fe Chair, Santa Fe Table, Clamp Rack, Provincial Bench, Step Stool, Box with Marquetry Top, Ash Wall Desk, Fork Lift Toy, Connecticut River Valley Highboy, Part 1; *Articles:* Tempering Steel Tools; Three Easy Finishes for Oak; Making a Cabriole Leg; Hand-Cut

Dovetails; *Special Section:* Back Issue Index.

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

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

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

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

Vol. 16 No. 1 January-February 1992 Country Pine Mirror, Drop-leaf Dining Table, Chess Set, Shop Workcenter, Bandsawn Heart Box, Scroll-sawn Door Harp, Classic Firetruck, Toucan-on-a-Branch, Window Valance; *Articles:* Safer Router Bit Designs and New Accessories; Dutch Turning; Veneering; Tool Review: Plunge Routers; Special Section: Back Issue Index.

Stacking Bookcase July/Aug '89

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Next Issue . . .

Spring isn't a time you're likely to spend weeks on end inside the shop, so we've filled our upcoming May/June issue with clever, easy-to-make, weekend projects. There's an engaging little rollerball game called **Shoot-The-Moon** (our office staff can't keep their hands off it), an easy-build **Curio Shelf Clock**, and an article on **Collet Turning** that you can use to make everything from toy tops to elegant wine-bottle stoppers. Add to that a classic **Lingerie Chest**, a basic **Backyard Picnic Table**, a **Drill Press Organizer**, three more great projects, plus a feature on **Sharpening Guides and Gizmos**, and you've got one very special issue.

But there's more. If you want to work better and more efficiently, or if you dream of one day making a living from your woodworking hobby, then Roger Holmes' revealing article, **Thinking Like A Craftsman**, is a must read. Like every issue of *The Woodworker's Journal*, the May/June issue will be full of valuable tips and techniques to help you get the most from your woodworking efforts.

