The Woodworker's Journal
Vol. 14, No. 1 $3.95

SPECIAL SECTION:
BACK ISSUE INDEX

Shop-Built *Spindle Sander*

0 73361 64856 3 01

Included in this issue: **Tavern Table • Wall-Hung Ironing Board Napkin Holder • Tissue Box Cover • Mortise & Tenon Mirror Grasshopper Toy • Chest of Drawers • Compact Disc Holder**

January/February 1990

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15 PC. FORSTNER BIT SET

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12 PC. ROUTER BIT SET

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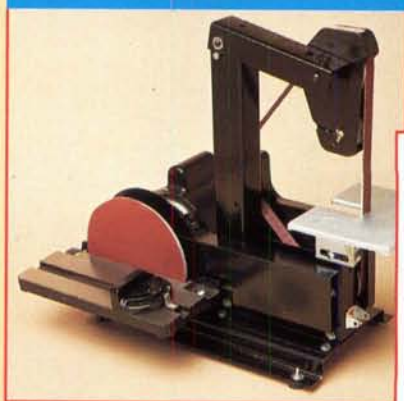

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The Woodworker's Journal

JANUARY/FEBRUARY 1990 VOLUME 14, NUMBER 1

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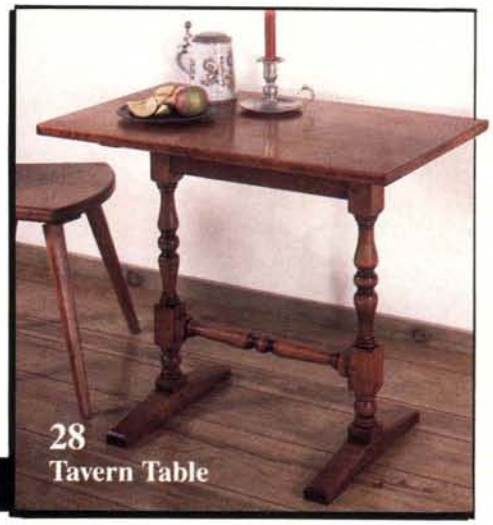
PROJECTS

Grasshopper Pull Toy 42



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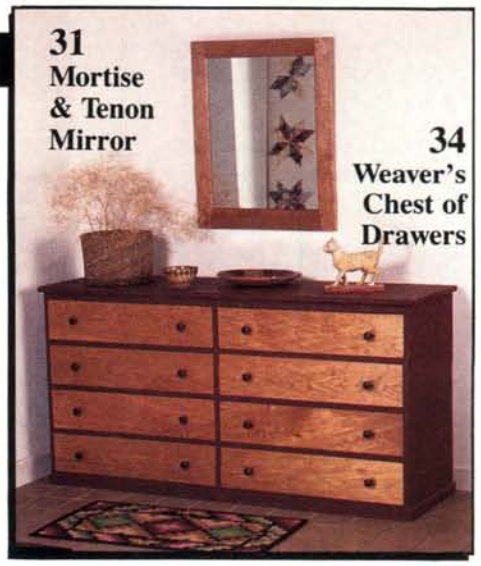

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Shoptalk

A New Decade

By the time you read this, the decade of the 80's will have passed into history. Some of you will stride forward with a sigh of relief; others are looking back with longing while treading cautiously ahead.

However you view the past and the future, from a woodworker's point of view the 80's opened up a new world of tools, technology, information and marketing, and the 1990's promise much more. Plunge routers, biscuit joiners and rechargeable tools have become common shop fixtures and there have been great advances in the technology of producing saw blades, router bits and . . . well, you name it! Yet, when I reached for my jack plane recently, the metal pegboard hook came undone for the millionth time. Does that sound familiar?

I have gone the complete route with tool boards. In the beginning I used plywood, drilled and screwed through for various pegs, brackets and shelves. But somehow things kept needing to be rearranged and the board got to be very uncraftsmanlike.

The beautiful uniformity of pegboard with all its perfectly spaced holes seemed like the perfect solution. I painted one Chinese red and loaded it with tools all hung from those neat steel hooks and brackets and it looked just great. It worked great too . . . except for those certain hooks that always pulled partially out when I removed a tool.

I tried epoxy which worked but inhibited my rearranging the tools to suit my changing needs. Then there were the plastic hooks which held tight, but they were only suited for 1/8 in. pegboard which I didn't like. Besides, they were not available except through a few mail-order sources.

Now there are accessory devices which clamp the metal hooks in place, but they are yet another expense and are still not generally available at the HIC . . . that's Home Improvement Center, or what we older guys still persist in calling the hardware store. After 30 years of this petty aggravation I finally pondered the problem and came up with a solution that has me feeling pretty good. Maybe it will help you too.

First, get a length of the plastic tubing the pet shops sell for aquarium pumps and filters. This is the thin-walled soft stuff with an O.D. of 7/32 in. and an I.D. of 5/32 in. Force the tubing over the short straight stub of a 1/4 in. diameter hook and cut off the remainder. Insert the upper bent part of the hook into the board and force the tubing-covered stub into its hole. It will hold solidly unless you are an unusually violent person. If you need to relocate the hook, it can be pulled out, but the tubing will pull off and fall down in back of the board, in which case it's simple to replace it with a fresh piece. That's my "high-tech" contribution to woodworking in the 1990's.

Jim McQuillan

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#491		1½" Classical		1½"	¾"	¼"	$25.00
#792		1½" Classical		1½"	⅞"	½"	$25.00
#231		5/32" **Roman Ogee**	5/32" R	1¼"	15/32"	¼"	$17.00
#232		¼" Roman Ogee	¼" R	1½"	¾"	¼"	$18.00
#661		¼" Roman Ogee	¼" R	1½"	¾"	½"	$21.00
#340		⅛" **Cove**	⅛" R	5/8"	½"	¼"	$12.00
#341		¼" Cove	¼" R	1"	½"	¼"	$13.00
#342		⅜" Cove	⅜" R	1¼"	9/16"	¼"	$14.00
#343		½" Cove	½" R	1½"	5/8"	¼"	$15.00
#644		¾" Cove	¾" R	1⅞"	¾"	½"	$28.00
#350		⅛" **Round Over**	⅛" R	¾"	½"	¼"	$11.00
#351		3/16" Round Over	3/16" R	⅞"	½"	¼"	$11.00
#230		¼" Round Over	¼" R	1"	½"	¼"	$12.00
#354		⅜" Round Over	⅜" R	1¼"	5/8"	¼"	$15.50
#355		½" Round Over	½" R	1½"	¾"	¼"	$17.00
#656		¾" Round Over	¾" R	2"	⅞"	½"	$21.00
#657		1" Round Over	1" R	2½"	1"	½"	$33.00
#370		⅜" **Rabbeting**	⅜" Deep	1¼"	½"	¼"	$14.00
#670		⅜" Rabbeting	⅜" Deep	1¼"	½"	½"	$14.00
#366		⅛" **Slot Cutter**	⅜" Deep	1¼"	⅛"	¼"	$14.00
#368		¼" Slot Cutter	⅜" Deep	1¼"	¼"	¼"	$14.00
#403		⅜" **Dovetail**	9 degree	⅜"	⅜"	¼"	$ 7.50
#405		½" Dovetail	14 degree	½"	½"	¼"	$ 8.50
#409		¾" Dovetail	14 degree	¾"	⅞"	¼"	$10.50
#709		¾" Dovetail	14 degree	¾"	⅞"	½"	$10.50
#402		⅜" Dovetail	8 degree For	⅜"	½"	¼"	$12.00
#404		½" Dovetail	8 degree Leigh	½"	13/16"	¼"	$12.00
#708		11/16" Dovetail	8 degree Jigs	11/16"	1"	½"	$17.50

ITEM NO.	BEST CUT BEST PRICE	DESCRIPTION	ANGLE/DEPTH/RADIUS CIRCLE DIAMETER	LARGE DIA.	CUTTING LENGTH	SHANK SIZE	PRICE
#415		¼" **Core Box**	round nose	¼"	¼"	¼"	$10.00
#416		⅜" Core Box	round nose	⅜"	⅜"	¼"	$11.00
#417		½" Core Box	round nose	½"	11/32"	¼"	$14.00
#418		¾" Core Box	round nose	¾"	5/8"	¼"	$15.00
#719		1" Core Box	round nose	1"	¾"	½"	$18.00
#470		¼" **Straight**	plunge cutting	¼"	¾"	¼"	$ 7.00
#471		5/16" Straight	plunge cutting	5/16"	1"	¼"	$ 7.00
#472		⅜" Straight	plunge cutting	⅜"	1"	¼"	$ 7.00
#474		½" Straight	plunge cutting	½"	1"	¼"	$ 7.00
#775		½" Straight	plunge cutting	½"	2"	½"	$14.00
#476		9/16" Straight	plunge cutting	9/16"	1"	¼"	$ 7.00
#478		⅝" Straight	plunge cutting	⅝"	1"	¼"	$ 8.00
#479		¾" Straight	plunge cutting	¾"	1"	¼"	$10.00
#781		1" Straight	plunge cutting	1"	1½"	½"	$12.00
#500		⅜" **Flush**	**Trimming**	⅜"	½"	¼"	$ 7.00
#502		½" Flush	Trimming	½"	½"	¼"	$ 7.50
#503		½" Flush	Trimming	½"	1"	¼"	$ 8.50
#804		½" Flush	Trimming	½"	13/16"	½"	$ 9.00
#545		**Tongue & Groove**	Straight	1⅝"	1"	¼"	$30.00
#845		Tongue & Groove	Straight	1⅝"	1"	½"	$30.00
#546		Tongue & Groove	Wedge	13/16"	1"	¼"	$30.00
#846		Tongue & Groove	Wedge	1⅝"	1"	½"	$30.00
#450		⅛" **Beading**	⅛" R	¾"	½"	¼"	$11.00
#451		3/16" Beading	3/16" R	⅞"	½"	¼"	$11.00
#233		¼" Beading	¼" R	1"	½"	¼"	$13.00
#453		5/16" Beading	5/16" R	1⅛"	½"	¼"	$14.00
#454		⅜" Beading	⅜" R	1¼"	5/8"	¼"	$15.50
#455		½" Beading	½" R	1½"	¾"	¼"	$17.00
#375		**45 degree**	45 degree	⅝"	1½"	¼"	$15.00
#676		**Chamfer**	45 degree	⅞"	1⅞"	½"	$23.00

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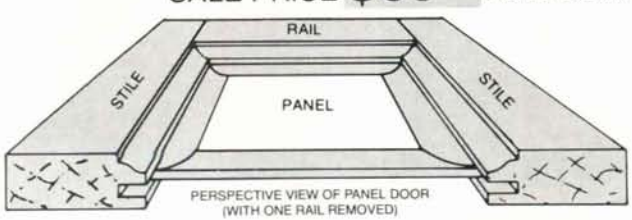

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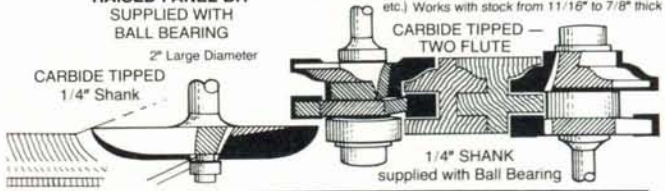

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Letters

In May, my husband and I were given the opportunity to help my son and four other 4th grade Cub Scouts earn their WEBELOS activity badge. We got out all our back issues of *The Woodworker's Journal* (which my husband has been getting since 1982) and selected several projects: the Workshop Tote Box and the Key Holder from January/February 1983, the Canada Goose Mobile from January/February 1987, the Folk-Art Door Stop from March/April 1987, and the Back Massager from May/June 1989. I just had to tell you that the project was a great success for the boys.

Thank you for the excellent quality of your magazine, and the range of skills that you address. How wonderful that we could use your projects to introduce these young men to a craft that enables them to turn a piece of wood into something useful. And into something they could be very proud of doing themselves.

Jim and Andrea Thein
Cub Scout Pack 381, Glen Ellyn, Ill.

Thanks for the Child's Table and Chairs Project in the January/February 1989 issue. I just completed a second set. The first one was cherry with the breadboard end treatment. I used maple for the second set and routed a detail in the table edge. To make the chair handle hole more comfortable to grip, I rounded the edge of the hole with a router and a 1/4 in. radius round-over bit.

This was my first major project since I started woodworking less than a year ago. Your plans and illustrations were extremely helpful.

Jay Kirk, Holland, Pa.

What a great article ("Mount Lebanon Shaker Village, A Museum in the Making," Sept./Oct. 1989 issue). Yours is one of the few articles to capture accurately what is going on here.

Also, I thought you would be interested to learn that Governor Mario Cuomo has announced that the Mount Lebanon Heritage Foundation received a $1 million challenge grant from the Office of Parks. So, this means we are off and running. The Foundation now has one year to raise the matching funds and begin the purchase of the historic site.

Andrew Vadnais, Executive Director
Mount Lebanon Shaker Village
New Lebanon, N.Y.

Last year we moved into a new home and I set up my small shop in the garage. Within six months almost every tool in my shop was rusty. How can I keep this from happening?

R.E. Wetzel, Carmel, Ind.

We've found that a treatment of kerosene and wax works well. First, give the tools a thorough cleaning with the kerosene. Let them dry for a few minutes, then apply a couple of coats of paste wax. Repeat the process about once a year and your tools should remain rust free.

I think one of the best projects you have ever given us is the Pine Wall Cabinet with Tinsel Art Panel which was featured in your July/August 1989

issue. I must admit that when I read the article I thought the tinsel art would be a "piece of cake." It wasn't quite that easy. At first I had a hard time tracing with pen and ink. It took me about four or five copies to learn how to keep a steady hand and control the flow of ink. After that things went just fine. It's really a great project.

John W. Shevlin, Sr., Rochester, N.Y.

One of the Shop Tips in the September/October 1989 issue caught my eye, and I wondered as I read it how many craftsmen were aware of a very serious safety infraction.

You show the use of a spring clothespin to hold a router bit high enough to tighten the collet. It's always been my practice (and I was taught this in woodworking college) that the bit should be set as near the bottom of the collet as possible to prevent the bit from wobbling or possibly flying out at the router's 30,000 rpm. Routers are generally designed to take the bit all the way in. I have known of cases where the bits were not set far enough into the collet and the bit was thrown out at high speed, causing injury.

Don Kinnaman, Phoenix, Ariz.

You are quite correct in pointing out the dangers of not inserting the bit far enough into the router collet. In the Shop Tip showing a clothespin holding the bit in position we didn't intend to suggest that craftsmen be careless about proper insertion of the bit. But there are many instances where the router bit needs to be held up a little *while tightening the chuck, and our tip is meant to simplify that operation.*

Many router makers, including Porter-Cable, recommend holding the bit 1/16 to 1/8 in. up from the bottom of the collet chuck. Also, there are times when you need to prevent the router bit from riding directly on top of the collet, such as with a slot cutter, or where the bit's shank is too short to bottom out in the collet chuck. But in all cases, the bits should be inserted fully through the split collet ring that tightens onto the bit's shaft. We think our Shop Tip makes that process easier for router table users, since two hands are free to properly adjust the bit depth.

Woodworking Clubs

The Greeley Woodcrafters organized three years ago and now has 70 members. They meet once a month, usually in the woodworking shop of one of the local schools. If you think you would like to join, write to Bud Stanley, President, Greeley Woodcrafters, 1610 Fairacres Road, Greeley, CO 80631.

The St. Louis Woodworkers Guild meets the third Thursday of each month. Call or write Kenneth M. Schaefer, 430 Bryan Ave., Kirkwood, MO 63122, telephone (314) 966-2268.

The Appalachian Woodworkers Association meets on the fourth Tuesday of each month at the Western Steer Family Steak House in Johnson City, Tenn. For information, write to Frank Pickett, 603 Woodhaven Dr., Johnson City, TN 37604, tel. (615) 282-0018.

Readers' Information

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 we can.

I recently inherited a portable shop. The name on the cover is Porta-Shop. It is contained in a case about the size of a sewing machine. Inside is a table saw top, a bracket for a motor, a jigsaw attachment, and some other attachments. Unfortunately, there is no motor or manual to be found. The bracket for the motor has a model number of 7 and a serial number of 11774. I need any information I can get on this equipment.

Clayton B. Wilkins
4040 Synott Rd., #306, Houston, TX 77082

Perhaps you can help me. I own some Walker Turner equipment: a lathe, band saw and jigsaw. There are no model numbers or dates of manufacture. I assume these tools are from the 1930's. I would like to know a little history of the company and who bought them out and if anyone has parts for these tools.

Olaf K. Becker
11 Pleasant View Drive
Lake Toxaway, NC 28747

I'm looking for a Power Mount Adapter Kit for a Magna Shopsmith 10 ER. The kit allows present accessories to be used with the old ER machine. It consists of two mounting bolts, pulleys and a coupling. I also need a speed adjuster and accessories for the 10 ER.

Edward K. Gloeggler
Box 565, Long Beach, NY 11561

I'm looking for the cutters for an old Stanley 45 Multiplane. If you have a box of the cutters in reasonably good shape, I'll pay for them.

D.F. Peters
P.O. Box 187, Lakeside, CT 06758

I'd like some help finding a book you mentioned in the January/February 1983 issue of ***The Woodworker's Journal.*** On page 30 you mention a book called *Spinning Wheel Building and Restoration* by Bud Kronenberg (Van Nostrand Reinhold Co.). It's out of print and the library doesn't have it. Please help. I'll even buy a used one.

Delphine Maslow
2965 Long Leaf Drive, Mobile, AL 36693

I need an owner's manual and parts list for a Craftsman shaper, model no. 103.23920, manufactured by the King Seeley Corp.

R.L. Miller
16904 FM Road 2964
Whitehouse, TX 75791

Cabinetmakers' Supplies

Caning and Wood Finishing Suppliers

As a service to our readers, ***The Woodworker's Journal*** periodically lists sources of supply for various woodworking products. In this issue we've included two listings: companies who specialize in the mail-order sales of cane and related products, and those who specialize in the mail-order sales of finishing products. This is by no means a complete listing and we hope to include additional companies in future issues.

Caning Suppliers

Most of these companies also carry reed, splint, rush, rattan and related materials.

Cane & Basket Supply Co.
1283 So. Cochran Ave., Dept. WJ
Los Angeles, CA 90019
Catalog $2 refundable on first order

The Caning Shop
926 Gilman St., Dept. WJ
Berkeley, CA 94710
Catalog $1 refundable on first order

Connecticut Cane & Reed Co.
134 Pine St., Box 762
Manchester, CT 06040
Catalog free

H.H. Perkins Company
10 South Bradley Road, Dept. WW
Woodbridge, CT 06525
Catalog free

Van Dyke's Restorers
Box 278, Dept. 83
Woonsocket, SD 57385
Catalog $1

Wood Finishing Suppliers

Industrial Finishing Products
465 Logan St.
Brooklyn, NY 11208
Catalog $2.50

The Wise Co.
6503 St. Claude Ave.
P.O. Box 118WJ
Arabi, LA 70032
Catalog $4

Wood Finishing Supply Co., Inc.
100 Throop St., Dept. WJ8
Palmyra, NY 14522
Catalog $1

Woodfinishing Enterprises
1729 N. 68th St.
Wauwatosa, WI 53212
Catalog free

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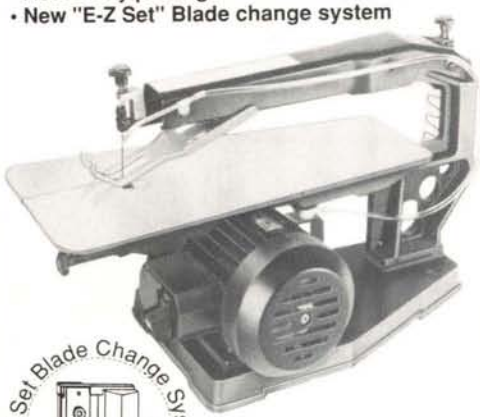

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FEATURES:

- **Parallel Rocker Arm Cutting System:** Drives the blade up and down, avoids blade breakage, polishes as it cuts, eliminates sanding.
- **"E-Z Set" Blade change system:** Clamps any thickness blade (down to "000" size) easily into the "E-Z Set" pivoting blade holders mounted permenently on the saw arms. Simplifies reattaching blades especially when making internal cuts.

SPECIFICATIONS:

- **Construction** ..... Cast Iron
- **Throat depth** ..... 15"
- **Max depth of cut** ..... 2"
- **Machine weight** ..... 43 lbs
- **Motor** - Heavy duty totally enclosed fan cooled 110-120V, UL listed, ball bearing induction motor
- **Blades** - uses 5" standard & pinend
- **Stroke length** ..... 3/4"
- **Cut Speed**..... 1650/min
- **Table tilt** .....0 - 45° to left

Options: Dust Blower & Saw Stand

Free with Purchase of Saw

- *12 Blade Assortment* ..... **$ 3.50 value**
- *Extra Std. Blade Holder set*.... **8.50 value**
- *E-Z Set blade change system*..**15.00 value**
- *Neptune 1-1/2" plastic Lettering guide set & patterns*..... **25.00 value**

***FREE* ... $52.00 VALUE**

Scroll Saw and Accessories Price List

(Compatible with Penn State Super 15" Saw and Scroll Saws of similar design)

Super 15" Scroll Saw - complete & assembled
#SAW..... **$119.95** ($10 UPS)

Dust Blower
Keeps your pattern line visible at all times, Our most popular accessory. Installation instructions included.
#BKT ..... **$ 15.00/kit** (•)

Scroll Saw Stand
37" high, drilled to align with saw, great convenience.
#STD ..reg $39.00, **On Sale**.... **$ 26.00** ($4 UPS)

Scroll Saw Blades
#BPK - 4 dz asst (2dz Pinend, 2dz #9)..**$ 14.00** (•)
#BPS - 2 dz Spiral blades (size #2) .....**$ 10.00** (•)

"E-Z Set" Blade Change System
(Free with purchase of saw). Includes top & bottom holders, all hardware and instructions.
#RET ..... **$ 15.00/set** (•)

Neptune 1-1/2" plastic Lettering Guide Set
(Free with purchase of saw). Includes upper & lower case alphabet + numbers + FREE patterns.
#LN1... reg $25.00, **On Sale....$ 12.00/set** (•)

Foot Switch
7 amp, 6 ft cord. For hands free operation.
#FSW.....**$ 20.00/ea.** (*)

(•) ***No freight chg if ordered with Saw, $3.00 for any combination of these accessories ordered separately***

Don't settle for less from importers selling stripped down versions of our Saw

Super 125 Planer

Portable with "Power Feed" • Shipped assembled • Retail value over $600.00

On Sale ... $339.95

Add $15 UPS Freight

This machine will pay for itself time and again by planing your own lumber. At 65 lbs, you can carry this Planer to a job site or mount it permanently in your workshop like any stationary machine. **You'll spend hundreds of dollars less** for this 12-1/2" power feed Planer than for a traditional stationary model of a similar capacity - with comparable results.

SPECIFICATIONS:

- **Knives**.... 2ea, 12-1/2" wide, HSS
- **Motor** - 16 Amp, 115V, 8000 RPM
- **Auto Feed rate** ..... 26.2 FPM
- **Cutting speed**..... 16000 Cuts/min
- **Thickness of stock** ..... 3/16" to 6"
- **Size** ... 15-1/2"H X 22"W X 21" Bed
- **Max Depth of cut** ..... 1/8"

Free plans for roller stand with purchase of rollers

Planer & Accessories Price List

Super 125 Planer - complete and assembled
#PLA ..... **$ 349.95** ($15 UPS)

Extra Set of 2 Knives - High speed steel, 12-12"
#PKN ..... **$ 25.00/set** (•)

Dust chute - for vacuum takeoff of wood chips
#PDS ..reg. $24.00, **On Sale** . . . . . **$ 15.00** ($3 UPS)

Planer stand - Heavy duty, 27-1/2" high
#PST ..reg. $44.00, **On Sale**..... **$ 39.00** ($6 UPS)

Ball Bearing Rollers - (Minimum purchase 2 rollers) Build a roller stand, infeed/outfeed table etc. with these 13" X 2" Heavy Duty rollers. Purchase includes FREE plans for building the roller stand shown above.
#BBR ..... **$ 6.50/ea** ($3 UPS/per order)

(•) No frt chg if ordered w/Planer, otherwise add $3 UPS

DC-1 Dust Collector
On Sale ... $189.95

Keep your shop clean and safe from sawdust with our large capacity, commercial style system. This collector has up **to 10 times more air flow** than a Shop Vac and runs **much quieter.**

SPECIFICATIONS:

- **1hp, 110/220V (pre wired 110V)**
- **610 CFM air flow** • **6990 FPM air speed**
- **2 Bags 15"dia X 22"** • **20 gallon bag**
- **4" inlet** • **Casters on base**
- **Weight 75 lbs** • **Size - 26"x15"x57"H**

Free with Purchase of DC-1
8 Feet of Duct Hose
4" To 3" Rigid Adaptor • 4" To 2" Flex Adaptor
Plans for 2 Stage Setup • Sources for Pipings & Fittings
FREE *. . . $15.00 VALUE*

Add $20 UPS Freight

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Our company has been in business for over 50 years. We unconditionally guarantee your satisfaction with our fine machines. All of our machines carry a Thirty day Money Back Guarantee and One year Warranty for Parts and Labor .

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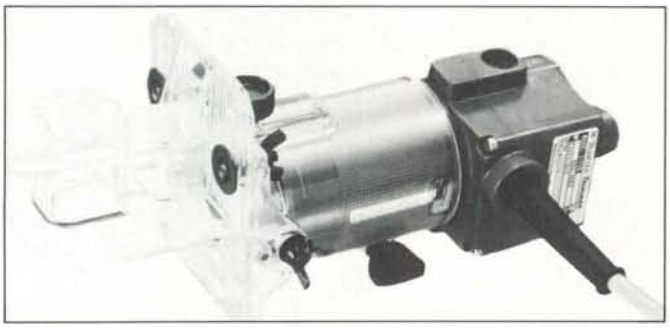
Add UPS Shipping Charges as noted
Continental U.S. only (Call for shipping charges to other locations)

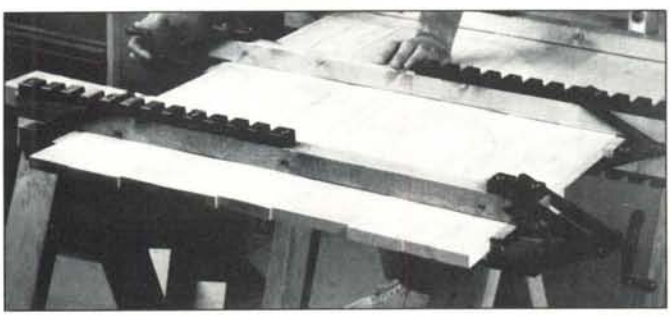
Product News

To keep our readers up-to-date, we use this column to feature brief descriptions of tools and supplies that may be of interest to woodworkers. The product descriptions are provided by the manufacturers and are not a result of tests or reviews by the editors of ***The Woodworker's Journal.***



See-Through Laminate Trimmer

It's easy to see the cutting action through the base of this 1/2 h.p. trimmer, model 3702B, from Makita. The see-through base tilts 0-45 degrees for odd angles and trimming in corners. The 1/4 in. collet trimmer also comes with a template guide, wrenches and a trimmer guide assembly. The list price is $198. For more information, contact Makita U.S.A., Inc, 14930 Northam St., La Mirada, CA 90638; (714) 522-8088.

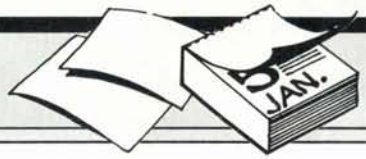


Four-Way Clamp

The Four-Way Clamp eliminates buckling when edge-gluing boards. It squeezes the work from both sides, as well as from top and bottom. The clamp system handles just about any span because it fastens onto 2 x 4 lumber. It sells for $29.99. For more information, contact Leichtung Workshops, 4944 Commerce Parkway, Cleveland, OH 44128; (216) 831-6191.

Corrosion Protection

Created for use on aircraft, Boeshield T.9 combines solvents, oils, and waxes to create a barrier against moisture. The aerosol has the ability to reach deeply into assembled products, dissolve minor corrosion, displace moisture, and leave a resilient coating that will be effective for years. Boeshield T.9 sells for $7.95 for a 12 oz. spray can. For more information, contact PMS Products, Inc., 607 St. Lucie Cresent, Stuart, FL 34994; (407) 286-7134.



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 six weeks before publication, Jan. 15 for the March/April 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.

Alaska: Alaska Creative Woodworker's Association, 1990 Woodworking Invitational Show, Jan. 6 - Feb. 24, Anchorage Museum of History and Auditorium, Anchorage. For more information contact the association at P.O. Box 201796, Anchorage, AK 99520-1796.

Arizona: Arizona Woodcarving Seminars: Jan. 8-13, Carving a Male Cardinal, Jack Bayman; Feb. 1-3, Carving a Coyote, Desiree Hanjy; March 1-3 and 5-7, Carving a Hobo Caricature, Harold Enlow. For more information contact Dave Rushlo, Wood Carvers' Supply, 2530 N. 80th Pl., Scottsdale, AZ 85257; (602) 994-1233.

California: California Woodworking 1990, Juried Exhibition, Jan. 11 - Feb. 16, Brea Civic Center Gallery, Brea. For more information call (714) 526-7100.

The Woodworking Shows, No. California, March 16-18, San Jose Civic Auditorium, San Jose. For more information call 1-800-826-8257.

Colorado: Anderson Ranch Arts Center, Summer Workshops, June through August: Basic Upholstery, Jim Barefoot; Chair Design, Robert DeFuccio; European Carving, Nora Hall; Canoe Building, Rod King; Marquetry, Veneer and Inlay, Silas Kopf; Basic Woodworking, Peter Korn; Rustic Furniture, Daniel Mack; Furniture Making, Stephen Proctor; Furniture, Sam Maloof; A Personal Approach, James Krenov; Faux Finishing, Rita Miller Wagennar. For more information contact the center at P.O. Box 5598, Snowmass Village, CO 81615; (303) 923-3181. Registration for summer workshops begins Jan. 1.

The Woodworking Shows, Colorado, March 2-4, National Western Complex, Denver. For more information call 1-800-826-8257.

Connecticut: Brookfield Craft Center, Winter Workshops: Jan. 13-14, Woodturning with David Ellsworth; Jan. 20, Tool Sharpening Workshop, Bill Gundling; Feb. 3-4, Japanese Woodworking Techniques and Joinery, Toshio Odate; Feb. 10-11, 18th Century Woodcarving Techniques, Eugene Landon; Feb. 24-25, European Style Cabinets, Paul Levine; March 3-4, Advanced 18th Century Woodworking Techniques, Eugene Landon; March 10-11, Fine Furniture Construction, Robert March; March 17-18, Router Techniques Workshop, Bill Gundling. At South Norwalk campus: Jan. 23 - Feb. 27, European Style Cabinets, evening workshop with Paul Levine. For more information contact the center at P.O. Box 122, 286 Whisconier Road, Brookfield, CT 06804; (203) 775-4526.

Florida: Fifth Annual Fine Handcrafted Furniture Show, Feb. 7-18, Florida State Fair, Tampa. Entry deadline Jan. 12. For more information call (813) 689-2989.

Woodworking World, The Jacksonville Show, Feb. 23-25, Jacksonville Memorial Hall. For more information call 1-800-521-7623.

Georgia: The Woodworking Shows, Atlanta, March 23-25, Lakewood Fairgrounds, Atlanta. For more information call 1-800-826-8257.

Illinois: The Woodworking Shows, St. Louis, Feb. 9-11, Gateway Center, Collinsville. For more information call 1-800-826-8257.

Indiana: The Woodworking Shows, Indianapolis, Feb. 2-4, Indiana Convention Center, Indianapolis. For more information call 1-800-826-8257.

Iowa: All Wood Fair, Jan. 26-28, Hawkeye Downs Large Exhibition Hall, Cedar Rapids. For more information contact The Wood Joint, 238 Blairs Ferry Road N.E., Cedar Rapids, IA 52402.

Louisiana: Woodworking World, The Baton Rouge Show, March 16-18, Riverside Centroplex, Baton Rouge. For more information call 1-800-521-7623.

Maine: Woodworking World, The Portland Show, April 27-29, Portland Expo Building, Portland. For more information call 1-800-521-7623.

Maryland: ACC Craft Fair Baltimore, Feb. 27 - March 4, Baltimore Convention Center. For more information call (914) 255-0039.

Massachusetts: Woodturners of the Northeast 1990, The Worcester Center for Crafts, Feb. 10 - March 17, 25 Sagamore Road, Worcester. For more information call (508) 753-8183.

Michigan: Woodworking World, The Grand Rapids Show, Feb. 2-4, Stadium Arena, Grand Rapids. For more information call 1-800-521-7623.

Missouri: The Woodworking Shows, Kansas City, Jan. 19-21, Kansas City Municipal Auditorium. For more information call 1-800-826-8257.

New Hampshire: Woodworking Association of North America: Woodworking Retreat, July 22-26, Waterville Valley Resort and Conference Center. For more information call 1-800-521-7623.

New Jersey: Buyers Market of American Crafts, Feb. 7-9, Atlantic City Convention Center, Atlantic City. For more information call (301) 889-2933.

New York: Woodworking World, The Long Island Show, Jan. 19-21, Hofstra University, Hempstead; The Buffalo Show, April 6-8, Erie County Fairgrounds, Hamburg. For more information call 1-800-521-7623.

North Carolina: Country Workshops, Winter Tutorials: Jan. 15-19, Ladderback Chairmaking; Jan. 29 - Feb. 2 and Feb. 12-16, Windsor Chairmaking; Feb. 26 - March 2, Advanced Windsor Chairmaking. For more information call (704) 656-2280.

The Woodworking Shows, Charlotte, Jan. 26-28, Charlotte Convention Center, Charlotte. For more information call 1-800-826-8257.

Ohio: Woodworking World, The Columbus Show, Jan. 12-14, Veteran's Memorial Hall, Columbus. For more information call 1-800-521-7623.

Oklahoma: Woodworking World, The Oklahoma City Show, March 9-11, Myriad Exhibition Hall, Oklahoma City. For more information call 1-800-521-7623.

Tennessee: Arrowmont School of Arts and Crafts, New Forms, New Functions, a national competition: Feb. 24 - May 19. For more information contact the school at P.O. Box 567, Gatlinburg, TN 37738; (615) 436-5860.

Texas: Woodworking World, The Houston Show, March 2-4, The Pasadena Convention Center, Pasadena. For more information call 1-800-521-7623.

The Woodworking Shows, North Texas, Feb. 16-18, Dallas Convention Center, Dallas. For more information call 1-800-826-8257.

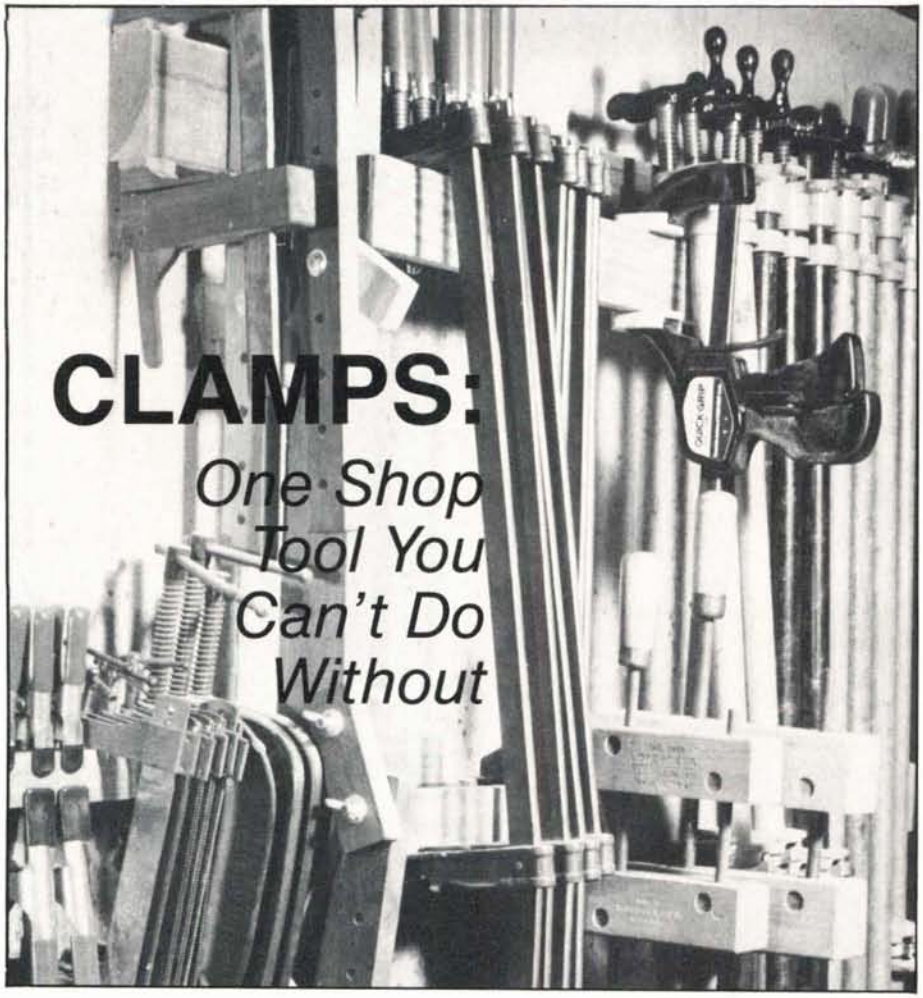
Virginia: Woodworking World, The Virginia Show, Jan. 5-7, The Norfolk Scope, Norfolk. For more information call 1-800-521-7623.

The Woodworking Shows, Metro-Richmond, March 30 - April 1, Richmond Centre, Richmond. For more information call 1-800-826-8257.

Washington D.C.: Diversity in Turning, through Jan. 20, Tenley Mall, 4200 Wisconsin Ave., N.W. For more information call (202) 244-4448.

Woodworking World, The Washington D.C. Show, Feb. 16-18, The D.C. Armory. For more information call 1-800-521-7623.

Wisconsin: The Woodworking Shows, Greater Milwaukee, Feb. 23-25, Mecca Convention Hall, Milwaukee. For more information call 1-800-826-8257.



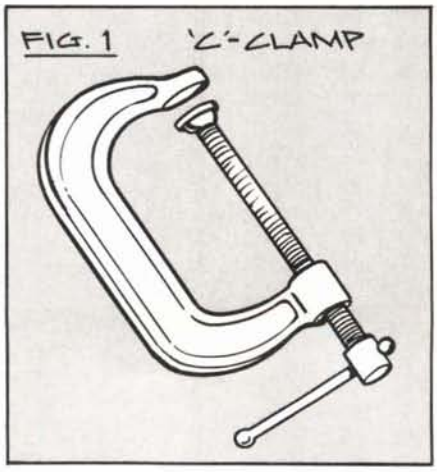
CLAMPS:

One Shop Tool You Can't Do Without

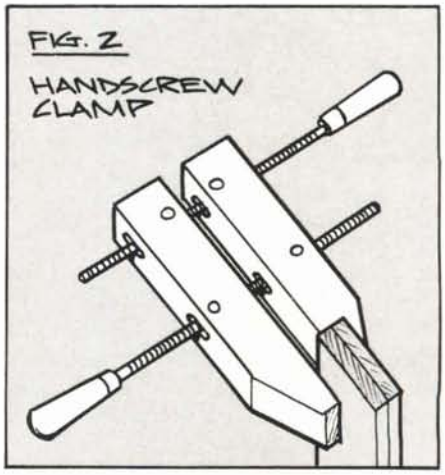
Woodworkers need clamps. No matter how many clamps you have, there always comes a time when you could use another dozen or so. But they're very expensive so most of us tend to get along until we *absolutely* can't do without another set.

Whether you're a professional or a hobbyist, a time for more clamps will likely come sooner or later. Some of these clamps are of the indispensable variety. Some just make life easier.

C-Clamps (Fig. 1) — An old standard, these clamps are invaluable for a multitude of uses. Just a few of the possible uses include face gluing boards, attaching an auxiliary fence to your table saw, holding small parts together for gluing, and holding workpieces *securely* to jigs and fixtures. You'll find these clamps especially handy for everyday jobs like attaching a stop to your saw fence or holding parts together while you hunt for the screwdriver. These clamps are really a spare pair of hands, and you'll constantly find new uses for them. Note that these clamps and others with steel jaws require a wood pad between the clamp faces and the workpiece.

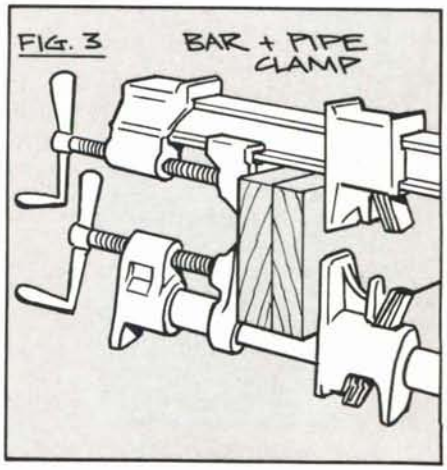


The clamps are sold in many sizes, with openings from 1 in. to about 8 in., usually with a throat depth of 1 in. to 3 in. They're also available with extra deep throats, up to about 5 in. When buying these clamps it's best to avoid the stamped steel variety often sold in discount stores. The ones to look for are made from ductile iron. Prices for good C-clamps range from about $3.50 for a standard 3 in. clamp to about $17 for a 6 in. deep-throat C-clamp.



Hand Screw Clamps (Fig. 2) — No woodworking shop is complete without these classic clamps. They're similar to C-clamps in shape, but the hardwood jaws won't mar your work *like steel* clamps, and the adjustable screws allow you to clamp at odd angles. To adjust the clamp, you grasp both handles and make a dog-paddling motion. (An observer to your left would describe the opening motion as clockwise.) The mechanical advantage of the hand screws allows you to supply a tremendous amount of clamping force.

Hand screws come in numerical sizes. For example, no. 000 has a 6 in. jaw length and a 3 in. opening, while the



no. 4 clamp has a 16 in. jaw length and a 12 in. opening. A good all-around shop clamp is the no. 1, with a 10 in. jaw length and a 6 in. opening. Expect to pay about $17 for each of those no. 1 clamps. You can also buy hand-screw kits, which provide the hardware, and make your own clamps. These kits sell for about $10 for the no. 1 clamp.

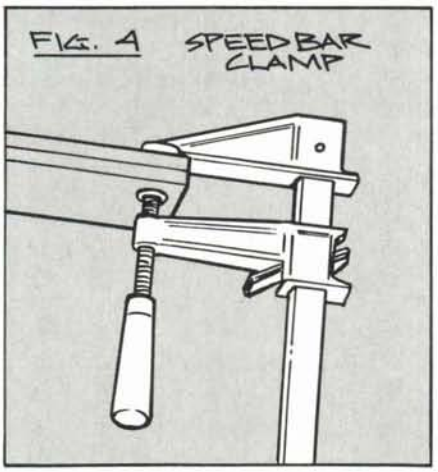
Bar and Pipe Clamps (Fig. 3) — Bar and pipe clamps are also indispensable for a woodworking shop. Pipe clamps came into existence primarily as a low-cost version of the steel bar clamp. They're essentially the same type of clamp, one uses an I-shaped steel bar, while the other uses standard 1/2 in. or 3/4 in. diameter black pipe. An obvious advantage of the pipe is that you can make clamps of any size you want.

The clamps are used most often for edge-gluing boards and clamping cabinets and casework together. They're also handy for squaring up large cabinets during carcase construction. You can run a clamp from corner to corner and easily square up a large piece. Bar and pipe clamps are usually from 2 ft. to 10 ft. long. One end is adjustable with a screw mechanism, while the other end employs a clutch that grips the bar or pipe. The clutch is infinitely adjustable and releases easily when the clamp pressure is relieved.

The bar clamps are rather expensive. You should expect to pay anywhere from $28 to $50 for a 4 ft. long clamp. The pipe fixtures run about $10 apiece, not including the length of pipe.

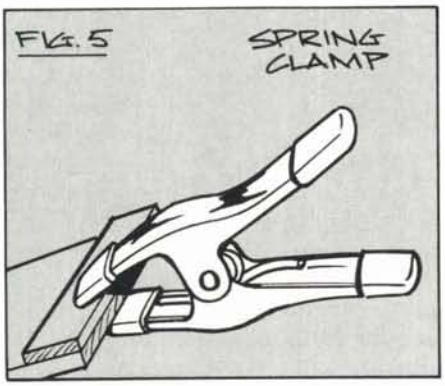
Another alternative for long cabinet clamps is wood bar clamps. Here you also buy the hardware and make up the clamp bars from hardwood. Wood bar clamps are an excellent solution because they don't mar the work. The clamp ends on the market are generally very high quality, so you won't save a lot of money. But you will have about the finest bar clamp available. Expect to pay about $30 per clamp.

Speed Bar Clamps (Fig. 4) — These clamps are similar to bar clamps, but they have a lighter bar and rapid-action sliding heads. They're very easy to adjust and the clutch releases with a nudge from your thumb. Nearly every professional shop has a number of these clamps in various sizes. They come from 6 in. to 24 in. long and with throat depths from 2 1/2 in. to 5 in. Expect to



pay about $9 for the smallest size and about $25 for the 2 ft. clamp.

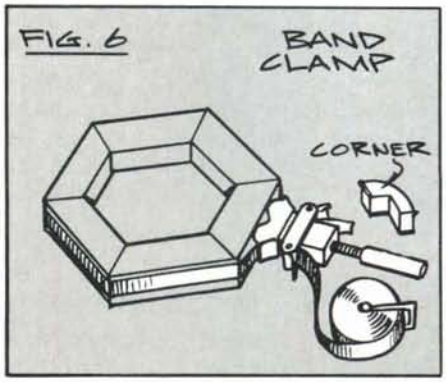
Spring Clamps (Fig. 5) — These clamps excel at holding parts in position for light gluing. They are often all you need since many gluing operations don't require a lot of force, just that the parts be held firmly together. The handles and tips are generally covered with vinyl so the clamps won't mar the work. You'll find yourself reaching for these clamps often, simply because they're so easy to



apply. You only need one hand and there's no handle to turn. The spring clamps are available in several sizes, from a 1 in. opening to a 4 in. opening. The small 1 in. size sells for about $2, while the 4 in. clamp goes for about $8.

Band Clamps (Fig. 6) — It's hard to imagine a woodworking shop without this useful invention. Applying pressure from all directions makes them handy for gluing up circles and polygons and other of odd-shaped objects. They're especially useful in furniture repair, where it's often difficult to find good purchase for a flat clamp head.

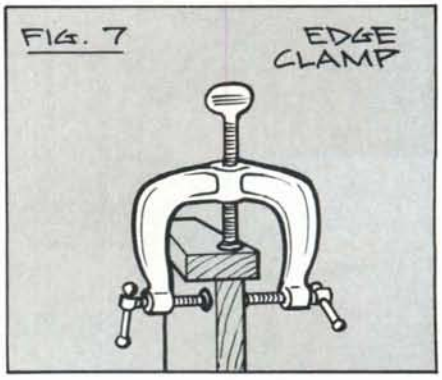
You can convert your band clamps into picture frame or corner clamps with the addition of steel corners, often sold with the band clamps. Band clamps are sold in light-duty versions with 1 in.



wide nylon bands and in heavy-duty models with 2 in. wide pre-stretched canvas bands. Lengths run from 10 ft. to 25 ft. Expect to pay about $11 for the light-duty clamp and about $50 for the heavy-duty model.

Edge Clamps (Fig. 7) — These edge clamps are a special kind of C-clamp, with an extra screw to apply force perpendicular to the workpiece. They're especially valuable if you do a lot of work with plywood. Instead of hauling out the bar clamps, you can use two or three of these clamps to apply facing boards or strips. They're also useful for applying moldings and for awkward furniture repair jobs.

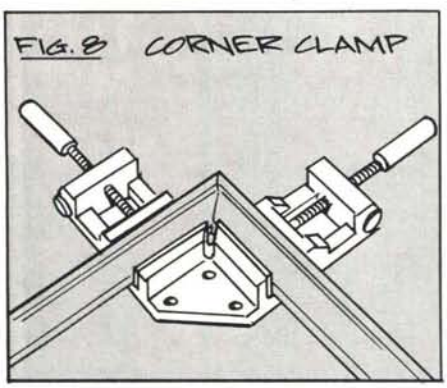
Another type of edge clamp is sold as an accessory to a speed bar clamp. These clamps employ a single screw and a fixture that fits over the 1/4 in. or 5/16 in. thick bar of a speed bar clamp. They work the same way as the C-clamp version; you just slide the edge clamp into position after tightening the bar clamp. They also have the advantage of



being able to apply pressure in the middle of a wide board or panel. If you do a lot of edge gluing, it's probably best to have both kinds of edge clamps.

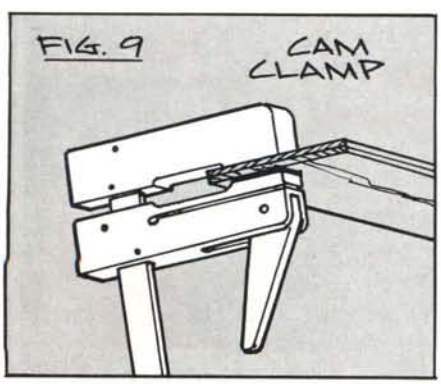
The C-clamp type commonly sold has a 2½ in. opening and a 2½ in. throat depth; the add-on type of edge clamp has a 9 in. long screw. Both types sell for about $8.

Corner Clamp (Fig. 8) — For making picture frames, mirror frames and similar jobs you'll want a set of corner clamps. They apply pressure in the right direction for these tricky miters. There



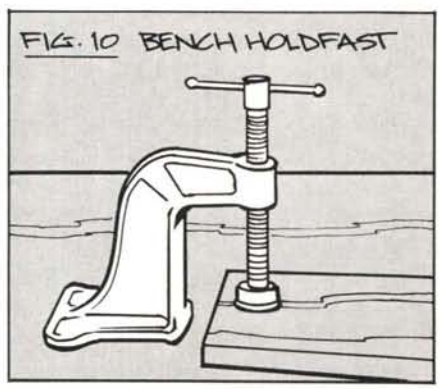
are many varieties of this type of clamp. The clamp shown acts like a vise on one corner at a time. But there are also varieties that apply pressure on all four corners at the same time. One type has four adjustable corners that slide along steel rods or bars. Another type employs bars that run diagonally from corner to corner. Expect to pay $13 to $20 for the four-corner clamps and about $8 each for the vise type.

Cam Action Clamp (Fig. 9) — These are similar to the speed bar clamps, but in many respects they are better. They are easy to use because they are light and have cork clamp faces and a simple cam to apply pressure. You won't need to search around for a pad to protect



your work from steel jaws. They also exert a considerable amount of force, enough for most common gluing jobs. The jaws are commonly beech and slide on a steel bar. Sizes range from about an 8 in. bar to a 31 in. bar. The jaw depth is usually about 4 in., but they are also available with an extra deep jaw of 7¾ in. Expect to pay $10 to $15, depending on the size.

Bench Holdfast (Fig. 10) — These clamps fill the obvious need to hold work down to the bench. They come in several varieties, from the light-duty screw-type shown, to the traditional tap-down clamp used on cabinetmakers' benches. The clamps either fit through the bench top or into a fitting that stays

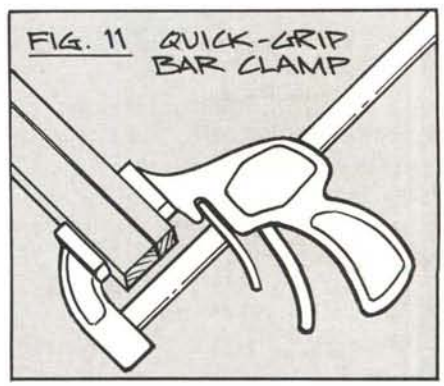


flush with the bench top when not in use. One heavy-duty type fits though a collar that's mounted in the bench top. The light-duty variety pictured fits over a mounting bolt. The obvious advantage of the holdfast is that you can put it anywhere you want on the bench. You can even buy extra mounting bolts or collars so you can mount the clamp in any of several convenient spots. The alternatives, using bar clamps or a vise to hold down your work, limits you to the edges of the bench.

Holdfast clamps have a capacity of from 3 in. to 7 in. The small clamp shown has a 3 in. reach and costs about $10. Extra mounting bolts are about $1 apiece. The larger heavy-duty clamps have a 7 in. reach and sell for about $40. Extra collars for the large holdfasts go for about $8.

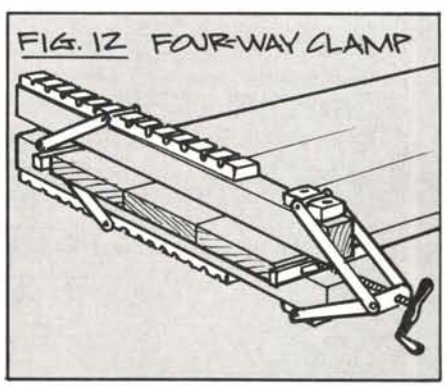
The traditional one-piece holdfast still may be the best solution for some woodworkers. It's made from forged steel with a crook on top of a heavy shaft. All you do is put the shaft into a hole and give it a tap. It holds the work securely until you release it with a tap on the back of the head.

Quick-Grip Clamp (Fig. 11) — Here's a new innovation: a clamp made by Vise Grip that closes with a pistol-grip ratchet. It's very handy since you only need one hand to place and close the clamp. The clamp has padded jaws so it won't mar the work. It even



releases with one hand. You just pull the trigger lever. The Quick-Grips come in sizes from a 6 in. opening to a 36 in. opening. Expect to pay about $15 for the small size and $25 for the large clamp.

Four-Way Clamp (Fig. 12) — This is another new innovation that's very handy. It's a variation of the bar clamp that exerts pressure from all four direc-



tions as it's closed. The fixture attaches to 2 by 4 lumber so you can make a clamp of virtually any size. The clamp is very handy for edge-gluing boards since it prevents the glue-up from buckling and helps to align the edges. The clamps also have wood jaws so they won't mar the wood from either clamp direction. Waxing the wood will prevent the glue from sticking to the bars. The clamps will handle stock up to 6 in. thick. The clamps cost about $30, but you have to supply the wood for the bars.

How to Hang Wall Cabinets

The real fun in woodworking is in making projects. But the challenges often come from unexpected places. After long hours of work chopping out mortises and fitting tenons on a fine wall cabinet, how to hang the cabinet might seem like child's play. But given a wall where the studs aren't in the right places, more than one woodworker has been stymied.

Of course, hanging a cabinet will be a different challenge for each new situation. If you've built the cabinet to mount on a concrete wall, then you'll use different hardware than for a sheetrock-over-stud wall. Knowing your hardware options and deciding what approach to take are the important considerations.

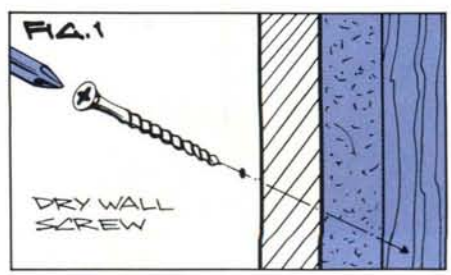
Although we've chosen the ubiquitous cabinet as the focus of this article, much of the hardware and techniques illustrated work as well on everything from flights of shelves to corner cupboards, clocks and mirrors.

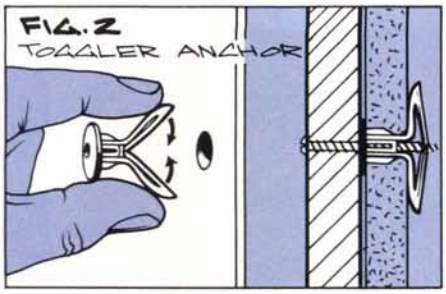
Think First

Thinking about how to hang a project before you actually build it saves headaches later on. If, for example, you have a simple cabinet with two sides, top, bottom, door and back, and plan to hang the cabinet on an area of the wall where it will span several studs, then the easiest way to hang the cabinet is by screwing through the back into the studs. The key consideration is to make the back sturdy enough, and to make sure it's securely attached to the cabinet. If the plans call for 1/8 in. or 1/4 in. plywood for the back, you should consider using 1/2 in. thick plywood instead. The challenge is how to hang the cabinet where the cabinet back is only 1/8 in. thick and there are no studs to screw into.

Commercial Hardware

Many cabinet-hanging problems can be resolved with the purchase of the proper hardware. There are many specialized devices for sale, but from a standpoint of simplicity, it's hard to beat the plain old screw. Only today there's one new wrinkle — be sure to buy dry-wall type screws (Fig. 1). They're available in a multitude of sizes and lengths, don't require a pilot hole, and can be driven effectively with a drill-

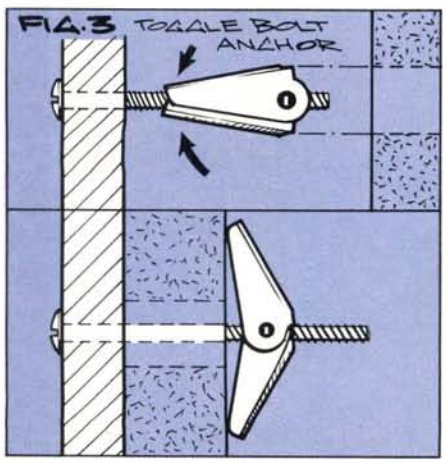




driver equipped with a Phillips bit. Since the drywall screw has a thin head profile, it pulls flush without need of a countersink, even in hardwood.

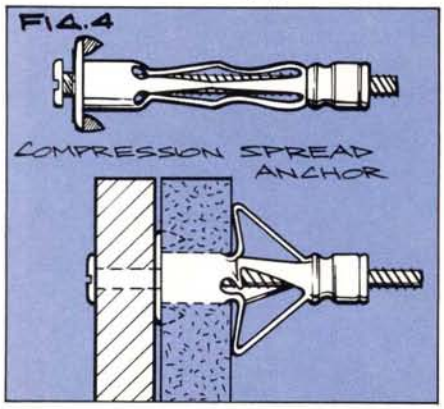
If you are faced with hanging a cabinet in a sheetrock wall where the studs aren't placed conveniently, then you'll need a hollow wall anchor. There are three basic types of hollow wall anchors. Plastic Toggler anchors (Fig. 2) actually work both in solid and hollow walls. The plastic wings spread apart as the screw is inserted. The screw provided usually isn't long enough if the item being mounted has much thickness however, so you may need to use a longer screw. These hangers are usually rated for medium-duty, at about 40 pounds of support on a wall.

The traditional choice for a medium- to heavy-duty hollow wall anchor is the

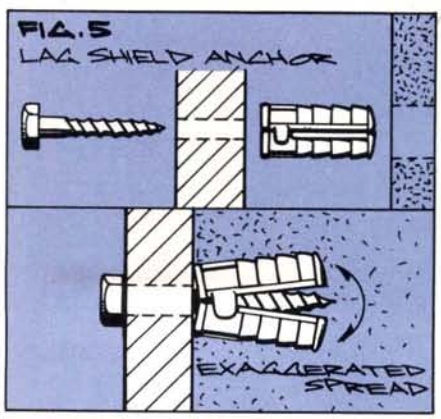


toggle bolt (Fig. 3). With the toggle bolt you just start the bolt on the nut in the *toggle, drill an appropriately* sized hole in the wall, and insert the toggle through the hole. The spring-loaded toggle wings fold up to fit through the hole, and then expand in the hollow. The bolt must be inserted through whatever's being hung before it's threaded into the toggle nut, since there's no way to get the part to be hung mounted after the toggle is inserted.

The third hollow wall anchor in our list is the compression spread device shown in Fig. 4. These are medium-duty hangers. As illustrated, the hanger is inserted into a hole drilled in the wall, and the screw is then tightened with a screwdriver. The casing spreads apart to



lock the anchor onto the wall. The screw is then removed and reinserted through the cabinet back. The advantage of this type of hanger is that the object being hung can be removed without losing the anchor. Just be sure to purchase an anchor that's sized to the thickness of your wall. A chart on the back of this and most other wall hanger packages

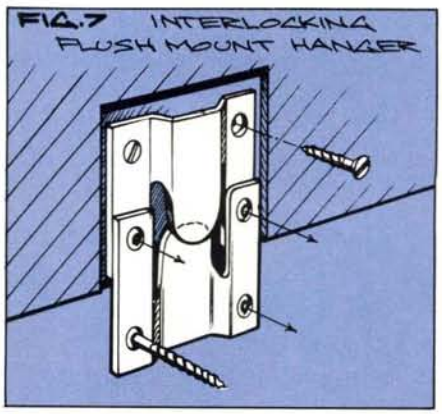


specifies what size anchor to use for a particular wall thickness, and what size hole to drill for that anchor.

If you're hanging a cabinet on a masonry, brick, concrete or stone wall that is solid (no hollow area), then you have two options, both similar. For the heaviest duty applications, use a metal-

jacketed lag shield (Fig. 5). Just drill the size hole as required for the size lag you're using and insert the lag shield into the hole so that it's flush with the wall. Then insert the lag screw through the item to be anchored and into the lag shield. As the bolt is tightened it spreads the two halves of the lag shield apart, locking the shield into the solid surface. Plastic-jacketed anchors (Fig. 6) work the same way, but they aren't quite as heavy duty.

If you are hanging a cabinet in an older plaster-over-lath wall, and you can't screw directly into studs, then the best approach is to use one of the hollow



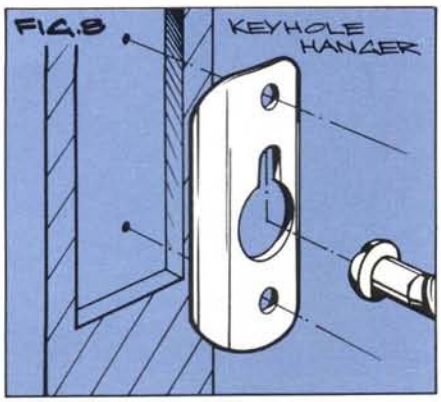
wall anchors. Since most plaster-over-lath walls are applied over studs, there's a hollow area between the studs. Just be sure to use screws long enough to penetrate through and into the hollow. Plastic-jacketed lags are an alternate choice, but they're not as strong and may eventually work loose.

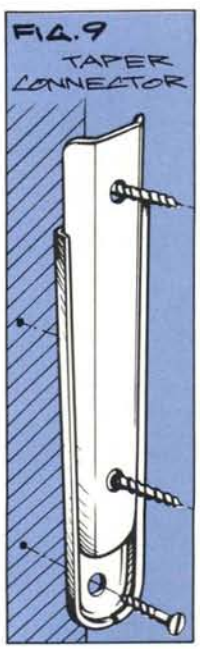
Four other commercial hangers worth mentioning are interlocking flush-mount hangers (Fig. 7), keyhole hangers (Fig. 8), taper connectors (Fig. 9) and bed rail fasteners (Fig. 10). With flush mount hangers, one bracket mounts on the wall, while the other bracket is recessed into the back of the piece being hung. With keyhole hangers the keyhole bracket can either be mounted flush or mortised into the back of the piece. A roundhead screw inserted into the wall then slips into the

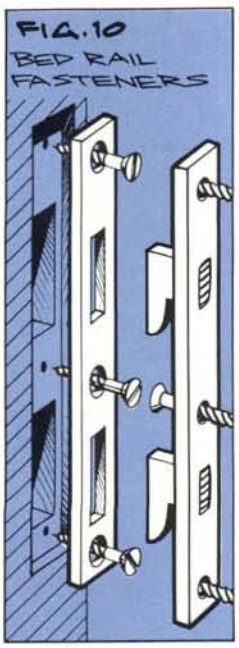
keyhole. If you need additional support, double keyhole fasteners are available.

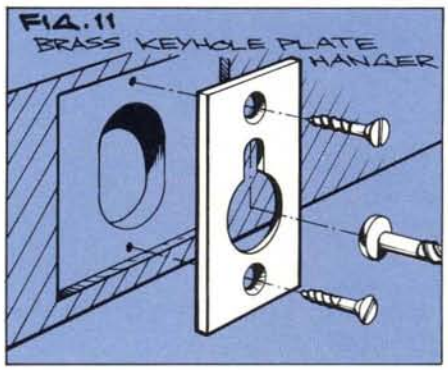
Taper connectors and bed rail fasteners are ideal for extra heavy-duty jobs. With both of these hangers, one part of the connection mounts to the wall and the other to the piece being hung.

One other commercial hanger is a solid brass keyhole plate (Fig. 11). These hangers are flat instead of raised like the keyhole hangers in Fig. 8, so in addition to the mortise for the plate itself you'll also to need to drill a recess for the screw head. However, many woodworkers prefer this type of fitting to the various stamped steel hangers. On a fine piece of furniture, it's often just a matter of principle. The back of the piece may not be visible, but there's something inharmonious about using a hanger that's stamped steel on a piece where all the other hardware is solid brass.



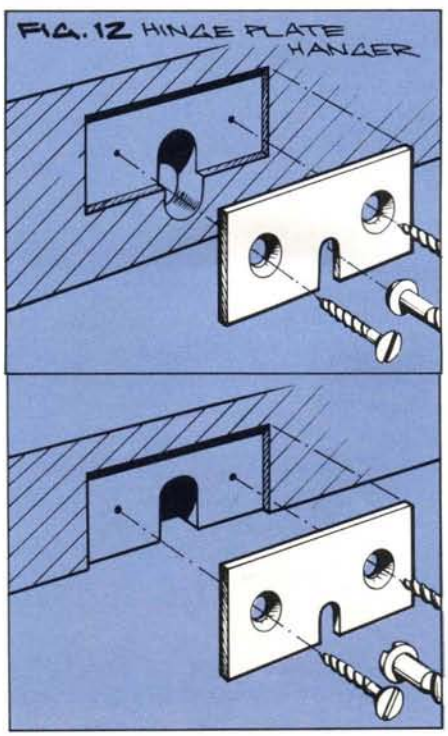






Shop-Made Hangers

There's something special about making hardware yourself. Fig. 12 shows a simple device that's actually just a modification of the idea behind the keyhole plate hanger shown in Fig. 11. This hanger is made by cutting off the barrel of old brass butt hinges. Each hinge yields a pair of hangers. Use a hacksaw to cut the barrel away, and then drill and hacksaw the slot. Use a file to smooth any rough edges. These shop-made hangers can also be made from steel hinges, though brass is preferred.

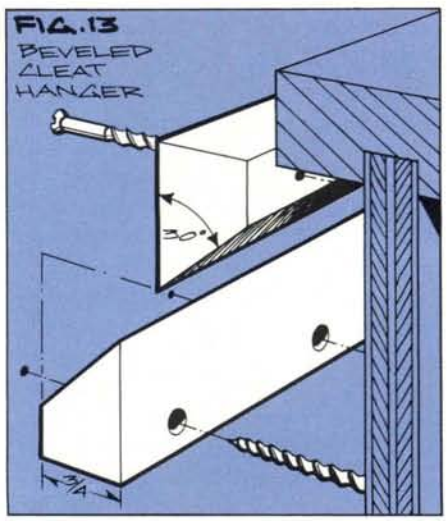


As shown, this type of fitting is used in several ways. The open-sided mortise is particularly useful for hanging shelves. But whatever the application, whether mortised into the back of a clock, into the back edges of a cabinet's sides, or into the bottom edge of a shelf, it becomes a strong, inexpensive and nearly invisible hanger.

A second shop-made hanger is the two-piece interlocking beveled cleat system shown in Fig. 13. A 30-degree angle is ripped on the two interlocking edges. One of the pieces is screwed directly to the wall and the other piece is fastened to the cabinet back. Applications are limited to cabinets where the back is recessed far enough to allow for the hanger thickness, which should be at least 3/4 in.

How It's Done

Hanging cabinets can be a comedy of errors if you're trying to balance the cabinet in one hand, with a level tucked under your arm, the drill-driver clenched in your teeth, while searching around for a stud with a hammer in your free hand.



To hang a cabinet on a drywall-over-stud wall, first locate your studs. The finishing nail and hammer technique is a never-fail approach, but investing in a stud finder will save time and eliminate a lot of unnecessary holes in the drywall. The electronic type of stud finder that reacts to density, rather than the older magnetic needle models, is recom-

mended. With it you'll be able to determine the exact center of the stud without guessing.

If you've only located one stud that falls within the area of the cabinet, don't despair. For a small cabinet, using several screws or hangers, one high and the other low, anchors the piece just as securely as if it spanned two studs.

Next, determine the height and location at which the cabinet will be hung. Then, gauging off the level, pencil a light line to mark where the bottom edge of the cabinet will fall. Again using the level, mark a second line where one side of the cabinet will fall.

If the cabinet has any weight or size to it, you'll find that a T-support is a big help. With a T-support to hold the cabinet in position, you are free to concentrate your efforts on hanging rather than supporting the piece. Professional installers use an adjustable T that quickly adjusts for any height. If available, a couple of friends or helpers can take the place of the T.

Also, don't try to sink those screws without first applying a little soap to the threads. A bar of Ivory soap with one side moistened is fine. Just run the threads lightly across the moistened side of the bar. The soap provides just enough lubrication so the screws don't bind, even in the toughest wood.

Problems

In the ideal situation you're hanging a cabinet on a wall that's flat and plumb, where there are studs to screw into. But in the real world that's rarely the case. More likely you'll be forced to anchor your cabinet with toggle bolts or hollow-wall anchors. And you'll probably be leveling and plumbing the cabinet on a wall that's neither flat nor plumb.

The answer to the question of what hollow wall anchor to use is basically just a matter of selecting the style anchor you like. With hollow wall anchors, whether it's toggle bolts, Toggler anchors, or compression spread anchors, they'll all work. But you'll need to use enough of the anchors to carry the load of what's being hung. One or two anchors are acceptable only for a lightweight piece. For a small cabinet use at least four anchors, one near each corner. For heavy objects space the anchors out every 8 to 12 in.

Occasionally you'll encounter a situation where a more creative approach is needed. An example is hanging book shelves on a paneling-over-stud wall where the studs aren't conveniently placed. You can't use hollow wall anchors because the roughly $^{5}/_{32}$ in. thick plywood paneling isn't sturdy enough to support them. And you can't screw directly into the studs because they aren't in the right place. The only option is to temporarily remove the paneling, install two-by-four nailers between the studs, and reinstall the paneling before mounting the shelves. If you're using a shelf bracket system, instead of running horizontal nailers, it's easier to just add several new studs in the locations required to provide the brackets with the needed support. Removing the paneling is not difficult unless it's glued to the studs. Use a nail set to punch the panel nails through the paneling, and then re-nail into a new area. Touch up the old nail holes with colored wax sticks.

Additional studs or nailers can also be added to sheetrock walls, but you'll need to be handy with drywall tape and joint compound to make the necessary repairs to the wall once the new studding is added. One other possibility is to run a long bolt clear through the wall and into a cleat on the other side. But this solution is only workable where the cleat on the other side of the wall won't be an eyesore, such as inside a closet.

One common problem encountered in hanging a wall cabinet is an out-of-plumb wall. It's possible to ignore the problem, but if you do then the cabinet won't hang plumb. This can cause doors to swing open or slam shut, or may torque the cabinet out of square so the doors don't even shut. If you're hanging a clock with an expensive movement, making certain that it's plumb and level is critical. If it's not the movement probably won't work as intended.

There are two approaches to getting a cabinet or clock to hang plumb and level on a wall that's not flat. Both require adjustments to the object being hung, as opposed to adjustments to the wall. The first method is used where the cabinet has a back that's inset relative to the sides, top and bottom. This inset enables us to make adjustments by planing down the back edges of the top, bottom or sides to conform to the wall. In order to determine the adjustment needed, first block the cabinet up so that it's in position against the wall. Make certain the cabinet is level and plumb, and then use a pencil and a small block of wood to mark a line all around the cabinet perimeter. The thickness of the block of wood should be equal to the widest point of the gap between the plumbed cabinet and the out-of-plumb wall. A hand plane or a jigsaw is then used to cut back to the scribed line. The cabinet will now be perfectly fitted to the wall. Use this technique for a permanent installation only. If you plan on moving the cabinet later, then a better approach is the filler-wedge method described below.

The second approach is required where the cabinet back is flush with the sides. Since the back is flush, there's no allowance for adjustment. This means that to get the cabinet plumb and level you'll need to shim it. If you are a stickler for detail you can rip narrow strips of the same stock as the cabinet, edge-glue them in place and apply the same finish as you used for the cabinet itself. In effect, you are just adding on to the top, bottom and sides, and then marking and cutting back as in the first method. An acceptable alternative is to rip a matching wedge as a filler and fit it in place with a dab or two of glue. Cut the filler from the same species of wood as the cabinet and finish it to match. Only you'll know about the filler wedge.

Occasionally, with a cabinet that you've built from plans, the design doesn't allow for easily hanging the project. A straightforward solution to this problem is usually just adding a cleat to the cabinet to serve as an anchor for your mounting screws. On a cabinet with a thin plywood back that's rabbeted in, the cleat is glued and screwed inside where the top and back meet. Screws are inserted along the cleat as needed to catch the wall studs. This eliminates the need for hollow wall anchors. Cleats can also be added to the outside face of the back in cabinets where the back is inset. Make the thickness of the cleat equal to the depth of the inset.

MARQUETRY: *The Direct Method*

by Nicholas Mariana

This feature concludes our marquetry series. We hope that some readers have taken the time to try one of the three techniques that we've detailed over the last several issues. For new subscribers, the pad method was covered in our September/October 1989 issue and the empty window method was explained in our November/December 1989 issue.

With these three techniques we only scratch the surface of the subject of marquetry. For example, techniques such as sand-shading, where an individual piece of veneer is dipped into hot sand to darken one corner or edge, can be used to further enhance your marquetry pictures. Sand-shading adds the illusion of depth and shadow that makes two-dimensional pictures seem to come to life. For more information about marquetry, check our Further Reading listing on page 24.

The direct method of creating a marquetry picture is used to produce identical copies of the same pattern. By identical we mean that the pictures will look exactly the same, right down to the color and grain direction of the veneer.

The direct method differs from the pad method in that a separate pad is made for each part. The parts are then assembled into the pictures. With the pad method, different species of veneer were all stacked in the same pad, and the parts then were shuffled to create different versions of the same pattern. The purpose of the direct method is to have maximum control over things like grain direction and color.

In the marquetry picture on our Tissue Box Cover project (page 38), the direct cutting method allowed us to repeat the same daffodil flower pattern on all four sides of the box. It also enabled us to

radiate the grain of the petals outward from the center of the flower. This helped lend the flower a more realistic appearance.

Pattern is especially important with the direct method. For the pieces to assemble easily without gaps, the pattern lines must be equal to the thickness of the saw blade used. Our full-size pattern is inked with a No. 0 technical pen. This pen draws a line that's .011 in. thick, which is equal to the thickness of a No. 1/0 jeweler's scroll or fretsaw blade. If you can't find them locally, these saw blades can be ordered from Constantine's (see Sources of Supply, page 24). Ask for their part no. 10W52.

If you are using our full-size pattern, all you need to do is make a number of photocopies of the pattern and cut out the parts individually. However, if you decide to make your own pattern, or copy some other pattern from a pattern book, then you'll want to pay close attention to line thickness.

One other thing you'll want to pay close attention to is the choice of veneer. For a marquetry picture to work you need to select veneers that not only contrast but also complement each other. The veneers we used for our daffodil work well with each other, and have the greatest contrast with the background veneer. One way to be sure of the veneers you select is to try them in a mock-up first. The mock-up also allows an opportunity to change things like grain direction to enhance an effect.

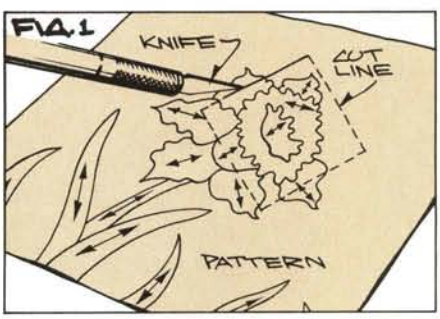
What You Need

Before starting out, make sure you've got all your materials together. In addition to your saw, some extra blades, and the pattern photocopies, you'll need masking tape and, of course, the veneer. As shown on the key accompanying the full-size pattern, we used walnut for the background (A), light koa for the leaves (B) and stem (C), primavera for the petals (D), dark koa for the trumpet base (E) and center (F), and ash for the trumpet flare (G). The arrows on the pattern indicate grain direction.

You'll also need some contact paper on which to assemble the marquetry pictures once you've got the individual parts cut out. The best choice here is the plastic stick-on window privacy sheeting that's sold in many hardware and building supply centers. You don't need much; a few square feet will suffice for the tissue box cover project.

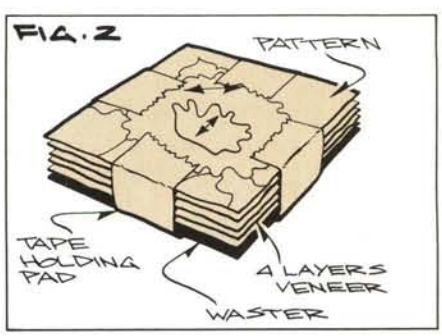
The Technique

Step 1: Cut out a separate pattern for each of the 17 shapes (16 flower parts plus the background) in the daffodil. Although you could make 17 separate photocopies and only cut out one piece from each photocopy, in practice you should be able to get more than one piece from a copy. Cut out a large enough area around each piece to allow for the masking tape that's used to hold each pad. Fig. 1 shows the approximate area that should be allowed, using the

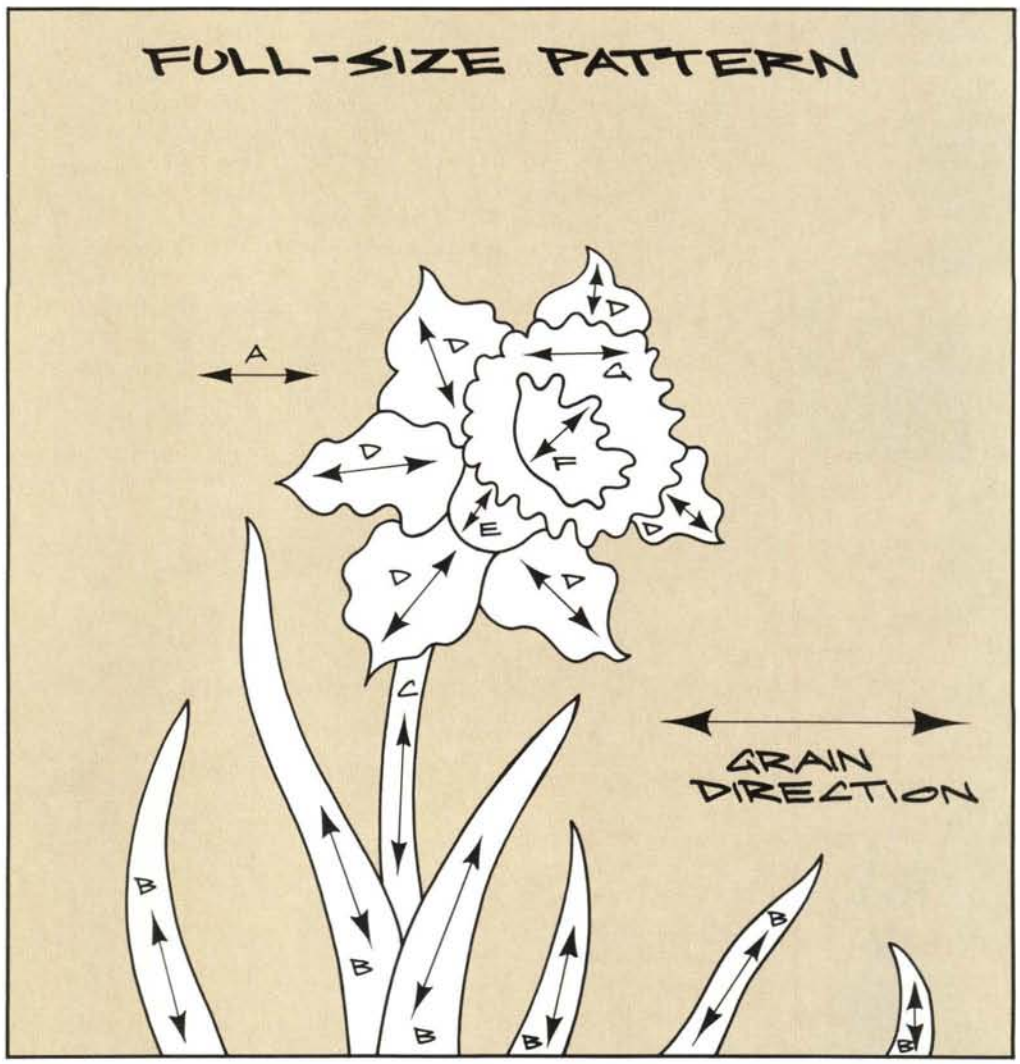


trumpet center as an example. We show a knife being used to cut the pattern paper, but scissors will do as well.

Step 2: Make a pad for each of the seventeen pieces. Each pad should be composed of four layers of the same veneer (matched carefully for color and



grain direction), sandwiched between the pattern above and a waster piece of veneer below. The waster piece is just a sturdy sheet of veneer that helps to prevent chip-out. Tape the pad securely on all four sides, as shown in Fig. 2.

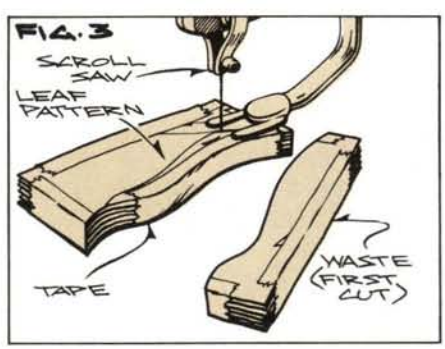


A = BACKGROUND (WALNUT)
B = LEAVES (LIGHT KOA)
C = STEM (LIGHT KOA)
D = PETALS (PRIMAVERA)

E = TRUMPET BASE (DARK KOA)
F = TRUMPET CENTER (DARK KOA)
G = TRUMPET FLARE (ASH)

Note that although Fig. 2 shows a squarish pattern for the trumpet center, your pads for some other parts, such as the leaves and stem, will be more rectangular. Make the pads large enough so they can be easily controlled, but not so large as to unnecessarily waste the veneer.

Step 3: Cut out the various parts. As shown in Fig. 3, which illustrates a leaf pad being cut, you'll need to add more masking tape after each cut to hold the pad in register. Just be sure that the tape you add doesn't accidentally cover your yet-to-be-cut pattern lines.

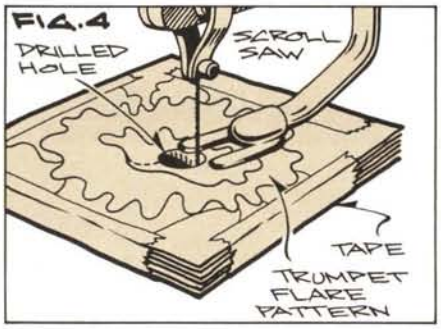


General cutting tips are to stay on the line, and run the saw slowly. If the saw is going too fast you'll not be able to follow the pattern lines faithfully. If you are cutting by hand with a fretsaw, be sure to keep the saw on a vertical plane. Any deviation from true vertical and the lower pieces in the pad won't be cut exactly on the pattern lines. If this happens, then the pieces won't fit together when you try to assemble them on the contact paper.

As shown, the leaves are cut in two

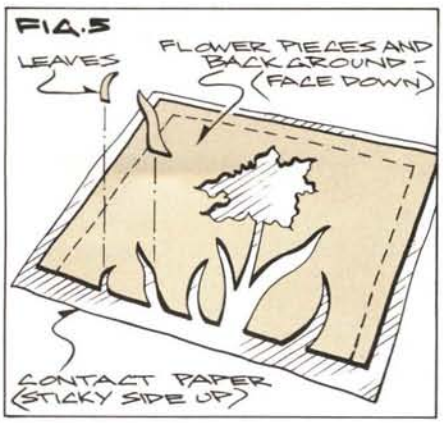
passes, working from the bottom to the point. The petals are cut using this same technique. Note that for the trumpet flare, however, you'll need to first drill a starter hole to insert the saw blade for the interior cut (Fig. 4). If any of the pattern parts that you intend to keep chip out during the cutting process, save the chips. They can be patched back in later.

In order to cut the background you



should make a pad exactly as you did for the other parts. It will just be larger, about 6 in. by 6 in. square. Be sure to add tape after each part of the background is cut away to keep the pad in register. Note that the grain direction of the background is horizontal.

Step 4: All that remains is to assemble the marquetry pictures on the contact paper, which is laid sticky-side-up on your work surface (Fig. 5). Start by laying down the background pieces.



Then add the various flower parts. Remember that all parts go face down, since that will be the outside face once they're glued onto the tissue box cover and the contact paper is removed. Finally, fill in any chips that may have broken out. If a chip is missing, you can always make a patch from some of the scrap.

Don't worry if everything doesn't fit up perfectly. Small gaps between the parts will usually disappear at the glue-up stage. This is because glue tends to swell the veneer slightly, closing up those gaps. Larger gaps can also be filled after glue-up, using a mixture of wood dust and glue.

You should now have four completed marquetry daffodils in walnut backgrounds, ready to apply to your tissue box cover.

Sources of Supply

Constantine's
2050 Eastchester Road
Bronx, NY 10461

Homecraft Veneer
901 West Way
Latrobe, PA 15650

Certainly Wood
11753 Big Tree Road
East Aurora, NY 14052

Premier Products
P.O. Box 3353
Scranton, PA 18505

Further Reading

The Marquetry Manual
by William A. Lincoln
published by Stobart & Son
London, England

Modern Marquetry Handbook
published by and available through Constantine's

If you're interested in learning more about marquetry, you may want to join the Marquetry Society of America, P.O. Box 224, Lindenhurst, NY 11757. The Marquetry Society publishes a newsletter and has an extensive pattern library. Annual dues are $15. Write for more information.

Protecting a New Finish: *A Guide to Waxes and Polishes*

by Jim Barrett

Articles on furniture finishing often recommend a good paste wax as the last step. But rarely, if ever, do you learn what a good paste wax is, or the reason for applying it, other than to protect the finish. You may well ask why you should immediately use wax to cover up that beautiful finish that took so much work to achieve.

Whether or not your newly finished piece of furniture needs the additional protection of a wax is largely a matter of personal preference. Some woodworkers like to apply a buffer coat of wax to provide an extra measure of protection, no matter what type of finish was used. They contend that it's much easier to reapply the wax once it wears away than it is to renew the finish. At the other end of the spectrum are those who feel the finish itself is protection enough. You need only give the piece an occasional dusting or cleaning until the finish eventually wears out and needs to be redone. Between these two extremes are those who prefer to wait until the original finish becomes dull before rejuvenating it with a wax.

Generally, an initial coat of wax won't hurt, especially on finished surfaces subject to excessive moisture, heat, and abrasion, such as a tabletop. Also, if you don't like the effect created by the finish you just applied, you can use a wax to alter the appearance by providing a greater degree of sheen. Or, with the addition of a pigment or japan color to the wax, you can darken or change the color of the finished surface.

Your decision on whether or not to wax also might depend on the type of finish you used. Polyurethanes and oil or synthetic varnishes, for example, usually provide a good, hard finish to begin with, so they probably don't require the additional protection of a wax — at least initially. On such finishes, you would use a wax or polish only after the finish has lost its original sheen and you want to revitalize it.

Oil finishes, such as tung or Danish oil, are intended to give wood a matte sheen or hand-rubbed look. They do not require initial waxing, unless the use of the piece requires the additional protection of a wax. If you simply want a greater degree of sheen or gloss than the oil finish provides, we recommend applying a lemon oil polish, rather than a wax.

The polish provides a slightly higher degree of sheen without losing the hand-rubbed effect, and won't build up as wax does. Maintaining the finish involves periodic re-application of the lemon oil treatment or your favorite supermarket-variety furniture polish like Pledge, Behold, Favor or Scott's Liquid Gold.

Shellac finishes, on the other hand, almost always require the additional protection of wax, because shellac is highly susceptible to damage from water, alcohol and other chemical substances. A shellac-and-wax finish is one of the quickest, easiest finishes you can apply, and is also easy to repair. It involves applying a sealer coat of shellac, followed by a coat of paste wax. In fact, wax alone can be used as a quick, easy-to-apply finish on bare or stained wood, when resistance to heat, moisture or physical abuse is not critical, such as on carvings or wood panel vertical surfaces. It's also easy to modify the wood color by adding pigments or japan colors to the wax.

There are two schools of thought on whether or not you should apply wax to new lacquer finishes. Generally, you can get the desired sheen or gloss in your choice of lacquer (gloss, semi-gloss, matte) and by rubbing it out with pumice or rottenstone.

Therefore you would only wax a newly lacquered piece to provide a measure of additional protection against moisture and chemicals. Some lacquer finishes are more resistant to moisture and chemicals than others, so your decision to apply a protective coat of wax will somewhat depend on the lacquer formulation you've chosen.

No matter what type of finish you apply, an initial coat of paste wax will provide an extra measure of protection and extend the life of the finish. Bear in mind, though, that applying a paste wax involves extra work, and the wax must be reapplied periodically to maintain that protection. And, eventually, the wax will "build up," causing splotches or dull spots in the finish. Also, some waxes contain chemicals that penetrate hard finishes, causing them to become tacky if enough wax accumulates.

When too much wax builds up, you'll have to strip it off before applying a new coat. Even so, maintaining a waxed surface may well be worth the extra effort if it postpones the day when you have to refinish the piece.

The Difference Between Waxes and Polishes

Furniture waxes are usually a mixture of soft and hard waxes (natural or synthetic) dissolved in a solvent such as mineral spirits or turpentine so they can be spread easily. Hard waxes include carnauba, obtained from the leaves of the Brazilian wax palm, and montan, extracted from minerals. These waxes provide a hard protective coat, but they're brittle, and are usually mixed with one or more softer natural waxes (beeswax, japan, candelilla) or synthetic petroleum-based waxes (ceresine, paraffin, microcrystalline).

Some old-time furniture finishers prefer to make their own "secret" formulas from combinations of these waxes and solvents. The waxes are available in flakes from Lee Valley Tools and other catalog suppliers. For most of us, though, it's easier to use a manufactured wax product such as Behlen's Blue Label Paste Wax, Johnson's Paste Wax, Minwax, Butcher's Wax and Trewax. Most manufactured waxes also contain various additives to enhance their performance — make them spread more easily, impart a higher gloss, increase the hardness, or speed drying time. They're available in paste and semi-paste (cream) form. The harder waxes generally contain higher amounts of carnauba, and are most suitable for high-use surfaces, such as wood floors and countertops. The softer waxes are easier to apply and buff out, and provide adequate protection for most furniture.

Furniture polishes, on the other hand, usually come in liquid form, including pump and aerosol versions. Formulations vary — most are a mixture of lemon oil- or petroleum-based oils combined with hardening and drying agents. Some may also contain small amounts of wax. Polishes are generally used to do just that — polish a dull finish. Although easier to apply than waxes, they don't provide as much protection, and generally require more frequent application to maintain a shine. Also, polishes won't impart the deep lustre and brilliant sheen associated with paste waxes.

Some waxes and polishes contain silicone to provide hardness and durability, but it's usually best to avoid these waxes or polishes. Silicone penetrates the finish, and may cause checking or alligatoring over a long period of time. Also, the silicone will eventually work its way into the wood pores, which can cause problems if you ever decide to refinish the piece with lacquer. It's hard to remove all traces of silicone from the wood, even if you use a paint or varnish stripper. These traces will show up as "fisheyes" in a new lacquer finish.

Tips on Using Paste Wax

On a newly finished piece, wait until the finish has cured completely before applying a paste wax. Seventy-two hours is safe for most finishes. Paste waxes are usually applied to flat surfaces with a soft cloth in a circular motion, allowed to dry to a haze, then buffed with a clean cloth or electric buffer equipped with a lamb's wool bonnet.

All of the wax manufacturers we interviewed agree that the most common mistake people make is applying too much wax and not buffing it out completely. The trick is to apply a thin, uniform coat over the entire surface. If you use too much, you'll just end up moving the excess from one area to another with your rag. When the excess wax dries, it will be harder to buff completely and will show up as dull splotches on the surface. To ensure even application and control the amount of wax applied, Jonathan Kemp at Behlen's suggests making an applicator by putting a gob of wax inside a double layer of white cheesecloth, kneading the wax until gooey, then, using slight pressure, applying it to the surface by straining it through the cloth.

"Apply the wax in an overlapping circular motion, waxing and buffing small sections at a time," Kemp suggests. After the wax dries to a haze, use a soft cloth to buff it out, first in a circular motion, then with the grain. An electric buffer will

speed the job, but the speed of the buffer itself is critical. A high-speed buffer can melt the wax, and sometimes the finish. Use a low-speed buffer designed specifically for waxing furniture.

Some finishers like to apply wax with a soft bristle brush, then use a second brush, followed by a soft rag to buff, much as you would polish a pair of shoes. This method works especially well on carved surfaces and intricate moldings, where wax has a tendency to build up in hollows and crevices.

The time between reapplications will vary, depending on the amount of wear the piece is subjected to. Wood paneling and other pieces that are rarely touched may require rewaxing only once every two or three years. Dining tables, wood floors, and other heavily used pieces may require waxing two or three times a year. As mentioned earlier, waxes generally outlast polishes, and require only an occasional buffing to renew their sheen.

Stripping Wax

Mineral spirits — one of the solvents used to melt wax into paste form — can also be used to remove built-up layers of wax or furniture polish without affecting the finish beneath. Simply dampen a rag with it and wipe off the wax. There are also several commercial furniture cleaners available for stripping wax from furniture. Do not use floor (acrylic) wax strippers, as these may contain solvents that could damage certain finishes. Furniture refinishers, which are a mild form of paint and varnish stripper, will also remove wax, as well as some of the finish beneath (oil, lacquer or varnish). These are recommended when the finish itself is worn, checked or damaged, but not to the extent that the piece needs to be completely refinished. Use the refinisher to remove as much of the old finish as you want, then apply a paste wax to protect what's left.

For more information on wood finishing, there are a number of excellent books. Here are four titles that cover most aspects of finishing: *The Complete Manual of Wood Finishing,* by Frederick Oughton (Stein and Day); *Wood Finisher's Handbook,* by Sam Allen (Sterling Publishing Co.); *Adventures in Wood Finishing,* by George Frank (The Taunton Press); *The Art of the Painted Finish for Furniture and Decoration,* by Isabel O'Neil (William Morrow & Co.).

Mail-Order Sources

Garrett Wade
161 Ave. of the Americas
New York, NY 10013

Lee Valley Tools
1080 Morrison Drive
Ottawa, ON K2H 8K7 Canada

Wood Finishing Supply Co., Inc.
100 Throop Street
Palmyra, NY 14522

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Tavern Table

Here's a simple table patterned after a piece commonly found in Early American taverns. Many a settler took stock of his fortunes and made plans for a new life seated at one of these small tables.

We made ours entirely from cherry. But the small tables were made from a variety of woods, usually what the local craftsman had on hand.

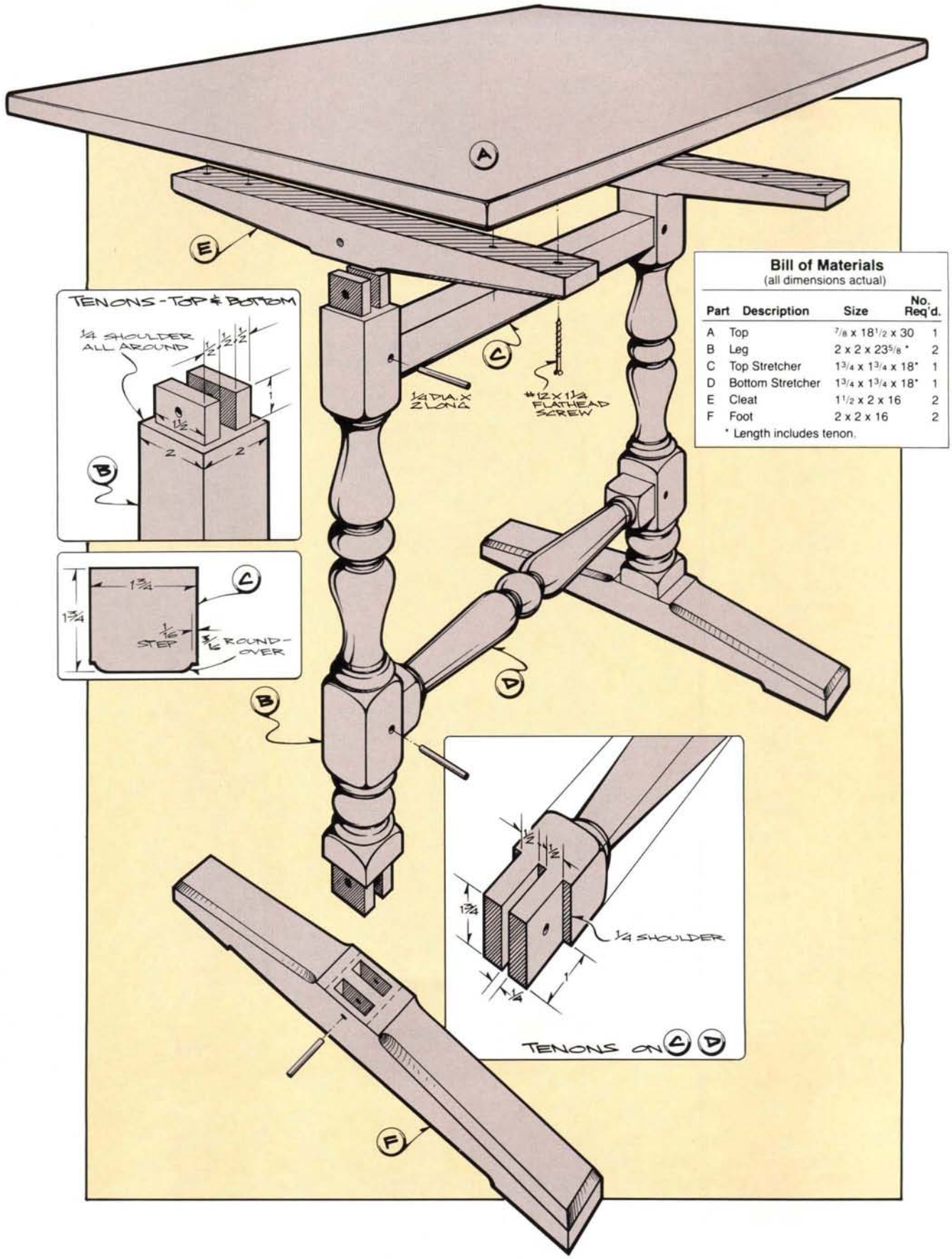
The construction is fairly simple, with trestle style legs that fit into chamfered feet. The joinery consists of double mortise-and-tenon joints that are pegged. The pegs add an interesting detail, and were commonly used instead of glue when these tables were originally made.

Start by edge-joining enough cherry boards to make the 18 1/2 in. wide top (A). You'll probably want to make the panel for the top a little wider and longer than the finished size so you can square it up after gluing. Keep the boards as flat as possible during glue-up. One method of keeping the top flat is to clamp sturdy waxed blocks to one or both faces. (The wax prevents glue from sticking to the panels.) The blocks are clamped at right angles to the grain and go approximately from edge to edge of the top.

While the top is in clamps, cut the remaining lumber to the sizes listed in the Bill of Materials. Note that the dimensions for the legs (B) and the top and bottom stretchers (C and D) include the lengths of the tenons.

Next, move on to the turnings, which can be difficult because of the square sections, called pommels, that break up the spindle profile. It's difficult to make the transition from the square to round sections without tearing out the corners. The easiest way to cut the pommels employs the skew chisel in a two-step process. For the first step, hold the skew with the long point down and slowly feed the point into the stock. To widen and deepen the groove, back out of the cut and enter the cut again a little to the side and from a slightly different angle.

When the grooves are all around the square, move on to the next step — a gentle paring of the shoulder to smooth the cut.



Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Top	7/8 x 18 1/2 x 30	1
B	Leg	2 x 2 x 23 5/8 *	2
C	Top Stretcher	1 3/4 x 1 3/4 x 18*	1
D	Bottom Stretcher	1 3/4 x 1 3/4 x 18*	1
E	Cleat	1 1/2 x 2 x 16	2
F	Foot	2 x 2 x 16	2

* Length includes tenon.

Here, the skew is held with the long point up and well above the rotating workpiece. The cutting is done with the portion of the edge near the short corner of the skew. But it's important to cut only with the edge and not the corners. If either corner of the skew contacts the workpiece, you'll get a dig. Begin the *cutting action* with the flat of the bevel rubbing against the rotating workpiece. Then slowly change the skew angle to bring the cutting edge into contact with the workpiece. When the tool starts to cut, use a gentle rolling motion to smooth the shoulder.

This paring operation requires practice, so you may want to use sandpaper instead of the skew to smooth the shoulder.

Once the pommels are cut, the turnings are a straightforward combination of coves and beads around a double vase shape. First rough out the remainder of the cylinder with a gouge, then use the skew and gouge to cut the details. Making a full-size pattern from our drawings will help your accuracy in turning the parts. You can place the pattern behind the turning and refer to it as you work.

With the turning done, move on to the joinery. First, lay out and chop the mortises in the cleats (E) and feet (F). Use a drill press to establish a series of holes within the layout lines. Then square up the mortises with a chisel.

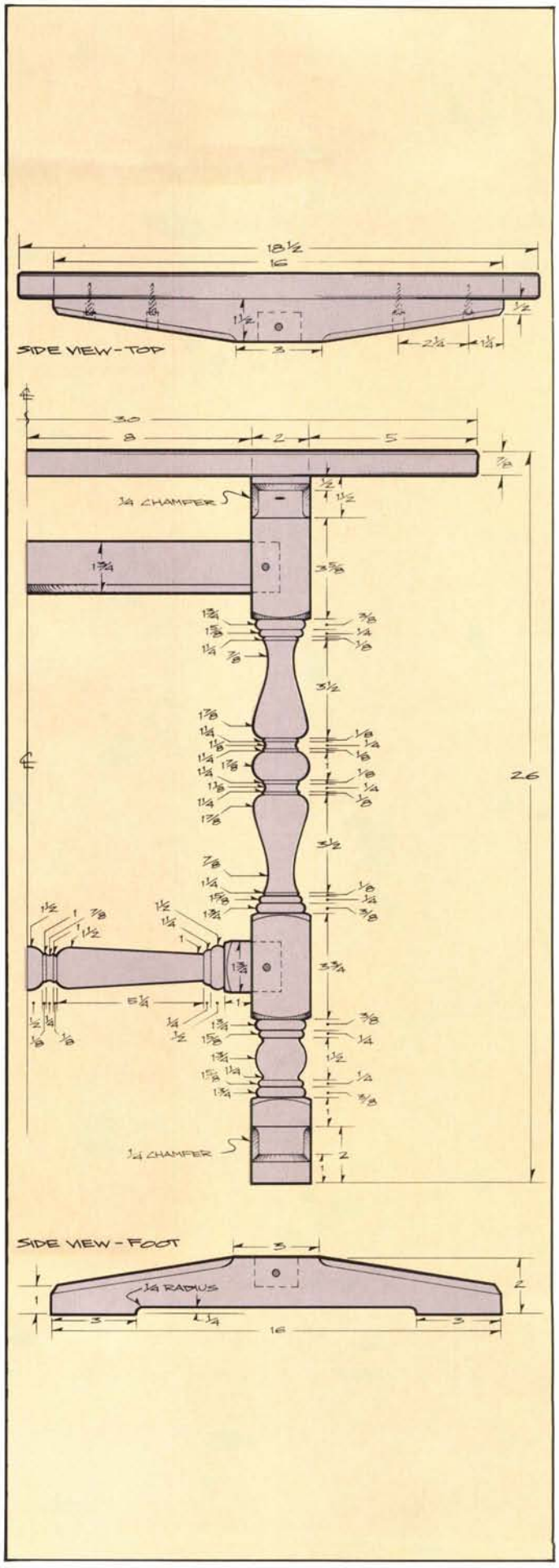
Next, cut the tenons on the ends of the legs and stretchers. You want to be sure of a snug fit, so use test cuts in scrap to make sure your setup is right before cutting the tenons on the turned pieces. Both the legs and the stretchers employ double tenons, but the legs have a 1/4 in. shoulder all around, while the stretchers have the 1/4 in. shoulder only on two sides.

For both, you establish the tenons in a two-step procedure. You first establish the shoulder with a crosscut on the table saw. (Remember to set the blade 1/4 in. high.) You then cut away the rest of the tenon with the workpiece on end. Use a dado head set 1/4 in. wide and 1 in. high. When cutting the workpiece on end, use a tenon jig high enough to accommodate two square sections.

After the joinery is complete, move on to the final details. Square up and sand the top, and taper and chamfer the feet and cleats. Also cut the profile along the bottom surfaces of the feet, establish the 3/16 in. radius stepped roundover on the top stretcher, and drill for the pins in the mortise and tenon joints. It's best to clamp the workpieces together and cut these holes with a drill press. The pin will be forced in when you do the glue up. While you're boring holes, also drill the screw shank holes and counterbores in the cleats. The counterbores are a bit oversized to allow the top to move with seasonal moisture changes in the wood.

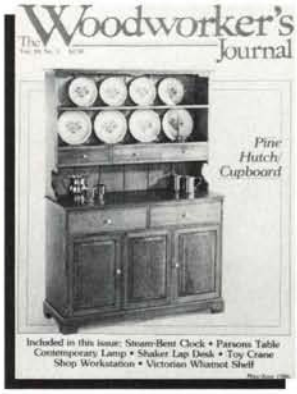
Next, give all the parts a thorough sanding, and dry fit all the parts one more time before gluing and finishing. The glue up is a two-step process. You first glue each leg into the foot and cleat. When each assembly is dry, you glue the two leg assemblies to the stretchers. Insert the pins while doing the glue-ups. Make them a little long and sand them flush.

After the glue dries, give the piece a final sanding and move on to the finishing, which imparts an antique flavor. We stained the piece with Minwax Colonial Maple, let that dry overnight, and then applied a coat of McCloskey's Walnut Varnish Stain. Right after brushing on the varnish stain we wiped the piece down with paint thinner, to highlight the turning crevices. We then applied two coats of orange shellac, rubbing the finish out with 0 steel wool between coats. After the second coat of shellac, which we also rubbed out with 0 steel wool, we applied a coat of Minwax Antique Oil Finish. As a final step, we rubbed the piece down with 000 steel wool and waxed the top.



The Woodworker's Journal

Special Pull-out Section



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The 1990 index lists alphabetically by category all projects and articles still available in back issues. (Most projects published prior to 1983 are available only in our books.)

Each entry includes the project title, volume and issue number. This table serves as a guide between volume/issue and year/month.

To order back issues use the form and envelope bound into each issue, or write directly to ***The Woodworker's Journal***, P.O. Box 1629, New Milford, CT 06776. Please include street address for UPS and allow 4-6 weeks for delivery.

Projects

Dimensions where shown are approximate.

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Bookcases, Shelves & Stands

Bookcases & Shelves (Wall-hung)

Boxes & Baskets

Cabinets & Cupboards

Heart Stool J/A '88

Cabinets (Wall-hung)

Carving Projects

Chairs, Stools & Benches

Chests

Oak Magazine Rack J/A '88

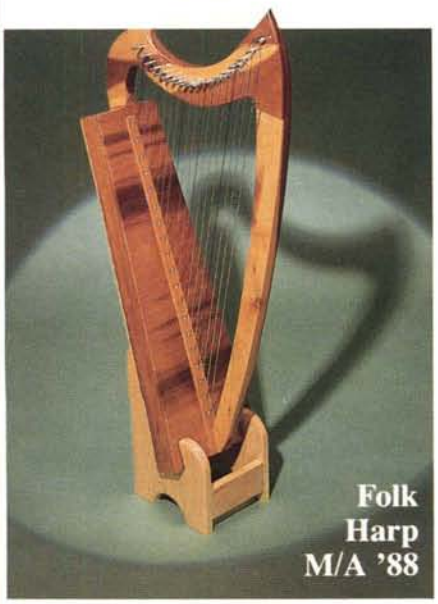
Children's Furniture

Clocks

Decorative & Ornamental

Desks

Desktop



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Kitchen

Pine Armoire M/A '89

Lamps & Lighting

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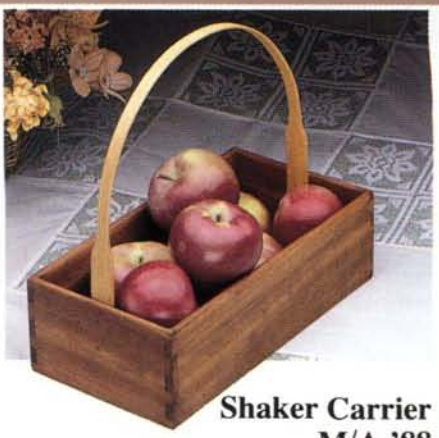


Shaker Carrier M/A '88

Special Techniques

Restoring Antiques

These articles were prepared by a furniture restoration specialist. While volumes can be written on the subject, John Olson gives woodworkers a broad overview of the steps and methods involved in refinishing and restoration.

Workshop Income

The information in Workshop Income is meant to give the reader a general knowledge of the important considerations in a woodworking business. When space limitations preclude an in-depth examination of a topic, we frequently recommend sources for further reading.

Finishing

Mortise & Tenon Mirror

Walnut pegs add a subtle accent to this mirror frame, and make it a perfect match for the Weaver's Chest of Drawers on page 34. Massachusetts woodworker Gene Cosloy made the frame from cherry and keeps it above the handsome chest.

The construction is very simple. The only wrinkle is the mitered quarter-round beads where the rails meet the stiles. The hand-cut miters can be a bit difficult, and some woodworkers stumble a bit without a machine solution. But taking 10 minutes to make the simple jig pictured in Fig. 3 will make the miters much easier. A simple jig often guides the hand more surely than years of experience.

Start by jointing one edge of enough surfaced stock to make the stiles (A) and rails (B). The stock should be a little wider than the $2^{3}/_{4}$ in. width given in the Bill of Materials. After one edge is true, rip the stock to $2^{13}/_{16}$ wide and then joint the other side. Take two passes with the jointer set for a $^{1}/_{32}$ in. deep cut. When you're done jointing, both edges should be smooth and straight.

Now cut the stock to the lengths given in the Bill of Materials, 30 in. for the stiles and $20^{1}/_{2}$ in. for the rails. With the stock sized, carefully lay out the locations of the mortises and tenons. Also mark the locations of the 45-degree miters so you're sure not to run past them with your mortises. It's best to use a marking awl or a sharp knife to mark the miters. Use the drill press to bore a series of holes for the mortises, and then use a chisel to square them up. (Note that the mortises are $1^{3}/_{8}$ in. deep, but the tenons are 1 in. long. The extra $^{3}/_{8}$ in. represents the width of the bead, which is removed later at the ends of the stiles.

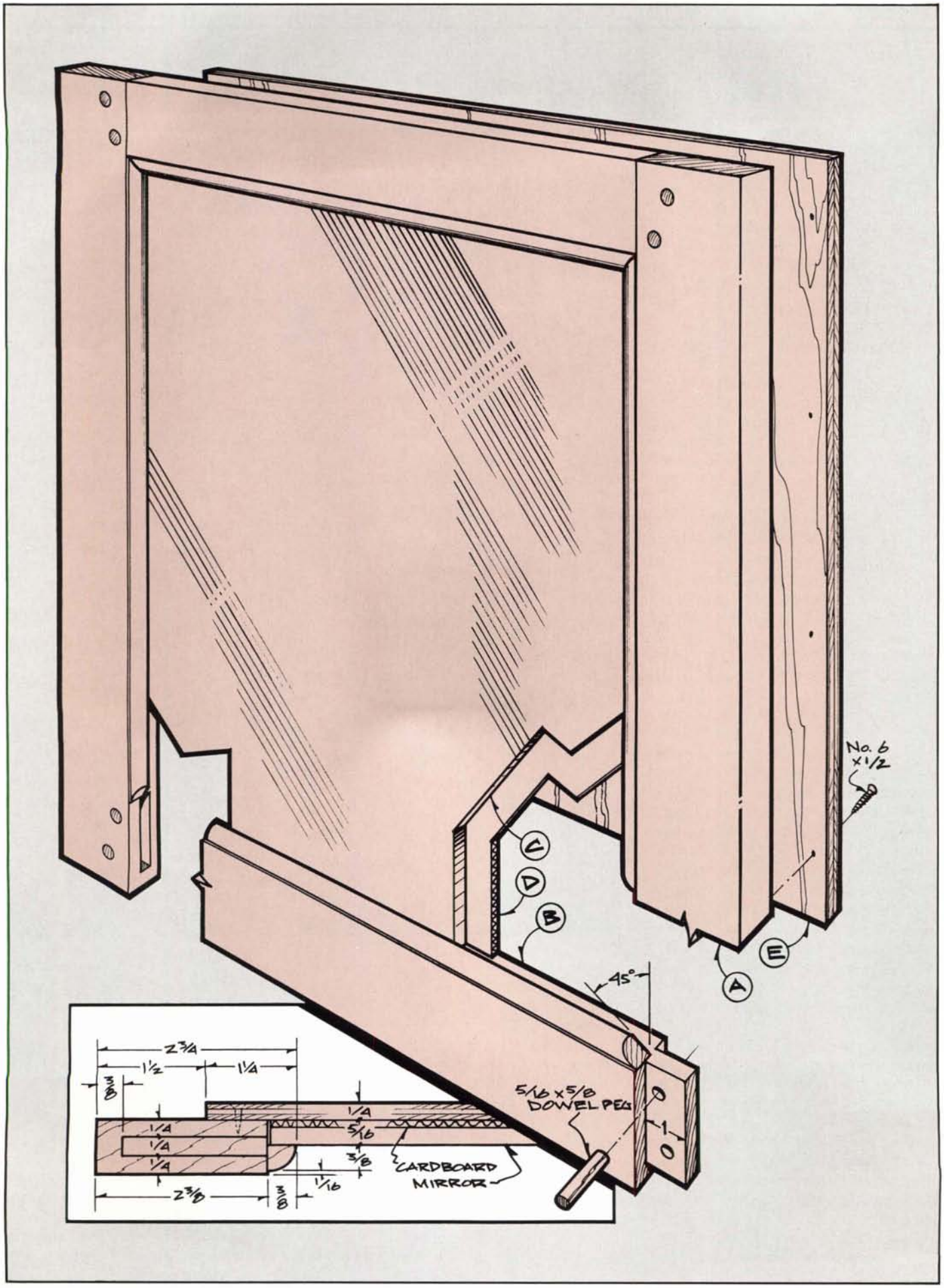
Now, cut the tenons. When doing this operation, test each setup with scrap stock. That way your tenons will fit just right, snug but not tight. First, establish the shoulders with crosscuts on the table saw. Set the blade to $^{1}/_{4}$ in. high for the side shoulders, and then raise it to $^{3}/_{8}$ in. high for the top and bottom shoulders. Next, raise the saw blade to 1 in. high and remove the rest of the tenon shoulder with the workpiece on end. Always support the work with a tenon jig when making end cuts like this (Fig. 1).

With the mortise and tenon joints cut, move on to the rabbets and beads. First, raise the $^{3}/_{8}$ in. radius bead with a bearing-guided bit in the router. Then cut the $^{3}/_{8}$ in. wide by $^{5}/_{16}$ in. deep rabbets with a straight cutter in the router. For the rabbet, it's best to use a router table with a fence or clamp guide boards alongside the workpiece to help support the router.

Next, cut the miters on the rail. First use a dovetail saw to cut on the waste side of the layout lines (Fig. 2). Then use the 45-degree jig and a chisel to pare the miters to the line (Fig. 3).

The stiles are mitered in the same fashion. But first you check the accuracy of your layout lines by placing the rails in position on the stiles. Next, you cut back the beads on the ends of the stiles. Use a table saw for most of the job. Set the width of the cut so that the saw-cut surface stands just proud of the shoulder of the bead, which establishes the finished width of the stile ends. (That shoulder was cut with a router, so it should be clean.) Then use a chisel to gently pare the remaining surface flush with that clean shoulder.

Next dry fit the frame parts, and drill the $^{5}/_{16}$ in. diameter by $^{5}/_{8}$ in. deep holes for the walnut pegs. One way to insure a tight joint is to slightly offset the peg holes, so that driving in the pegs draws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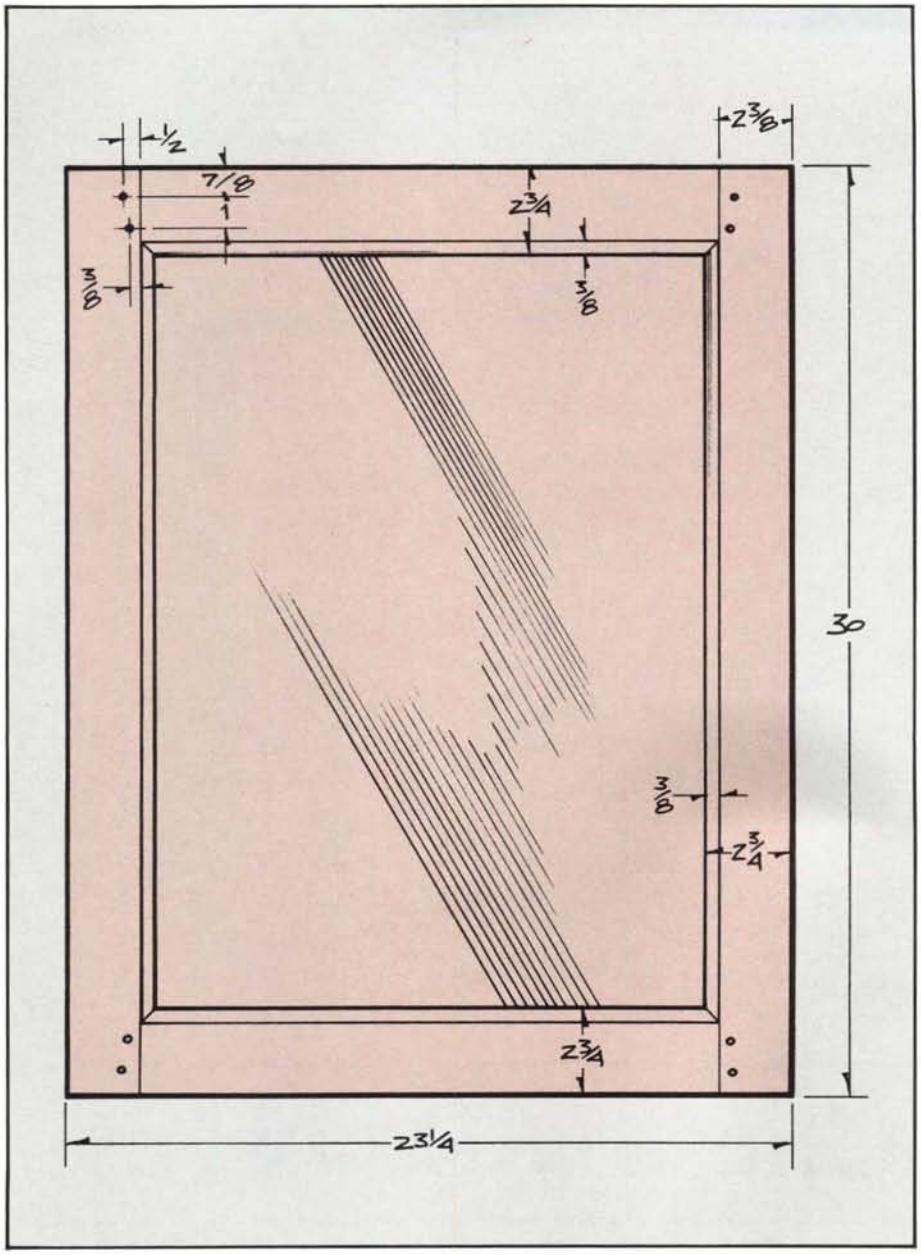


Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Stile	3/4 x 2 3/4 x 30	2
B	Rail	3/4 x 2 3/4 x 20 1/2*	2
C	Mirror	1/4 x 18 1/2 x 25 1/4	1
D	Backing Board	1/8 x 18 1/2 x 25 1/4	1
E	Back	1/4 x 20 1/4 x 27	1

* Length includes tenon.

the mortise and tenon together. The peg holes are staggered 1/32 in., with the tenon holes just slightly closer to the shoulder than the mortise holes. Note that the pegs are also slightly askew when viewed from the front, a design element that nicely complements what's going inside the joint.

With the joinery complete, take the frame apart and thoroughly sand the parts. Then clamp up and glue the frame, driving in the pegs while you have the assembly in clamps. The pegs should be a little longer than the 5/8 in. shown, and then sanded flush.

The mirror (C) should be cut about 1/16 in. under the actual rabbet-to-rabbet dimensions of the frame. Any glass shop can do the job for you. The backing board (D) goes between the mirror and the plywood back (E), which is screwed in place. The backing board can be foam board or cardboard. Foam board is sold at most art-supply stores.

FIG. 1

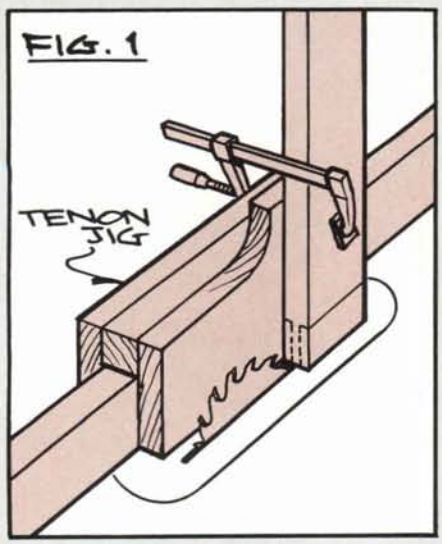


FIG. 2

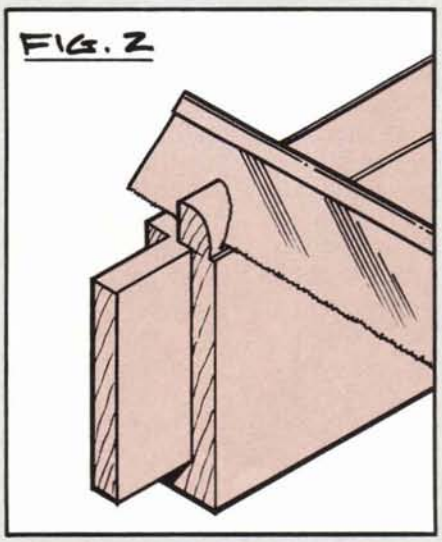
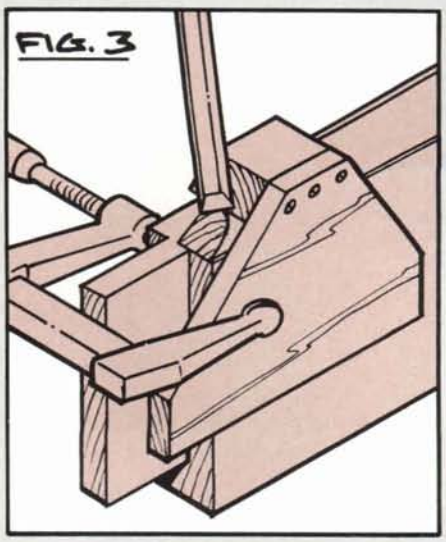


FIG. 3



Weaver's Chest *of* Drawers

Massachusetts cabinetmaker Gene Cosloy says that the inspiration for this piece was an early 19th-century weaver's chest made in the Mt. Lebanon, New York, Shaker community. Cosloy used a red milk paint for the case, which contrasts nicely with the natural butternut drawer fronts. The eight drawers are identical and hand-turned walnut knobs highlight the drawer fronts. The Shakers used the chest mainly for the storage of supplies, but this version could serve in almost any capacity.

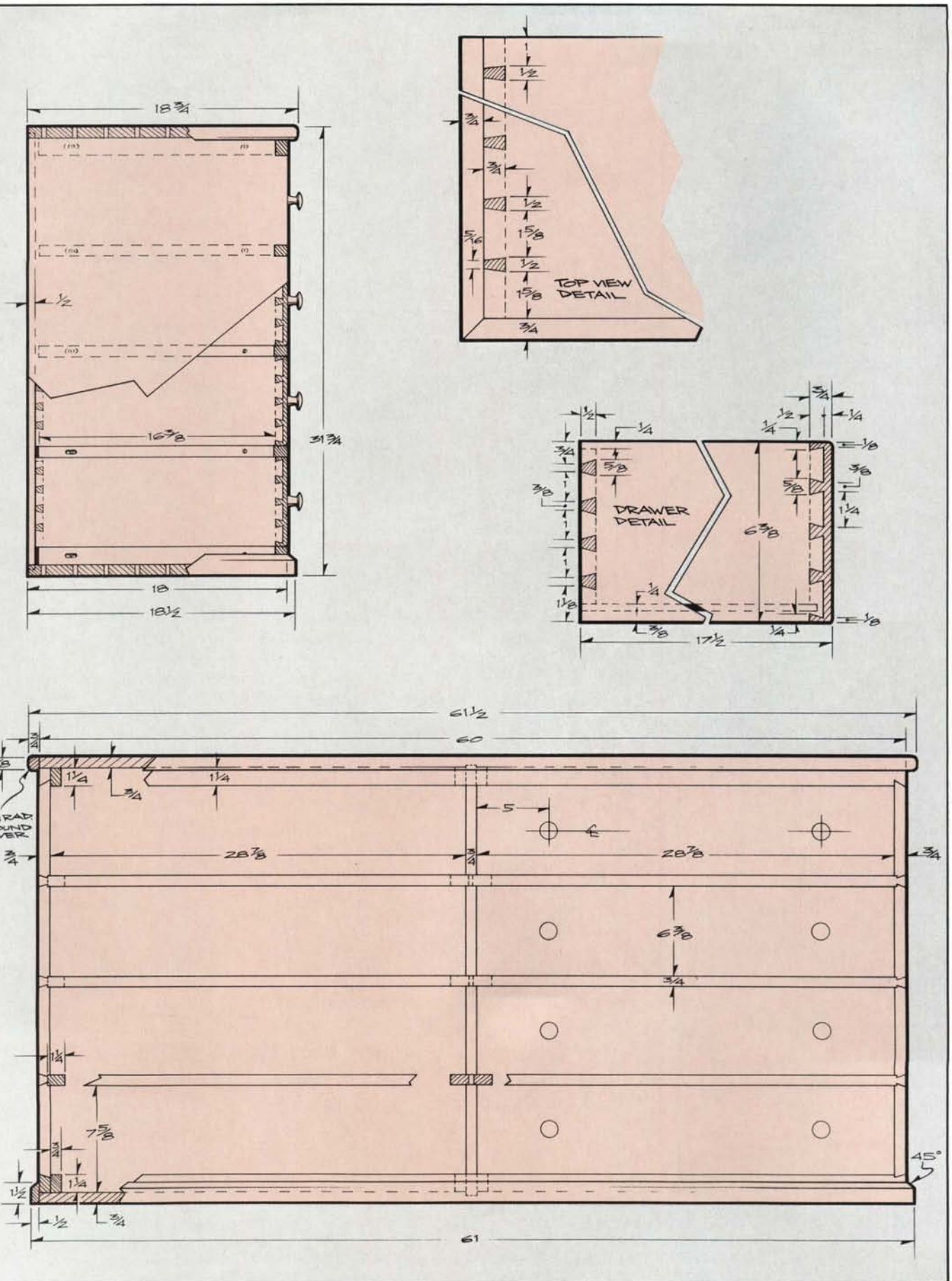
The case is basically a dovetailed box, with moldings applied top and bottom. Since the case parts are painted, there's no need to waste a costly hardwood here. Cosloy uses poplar, which he says works easily and accepts paint well. Of course, if you decide not to go with the painted case, you'll want to use a cabinet-quality hardwood throughout.

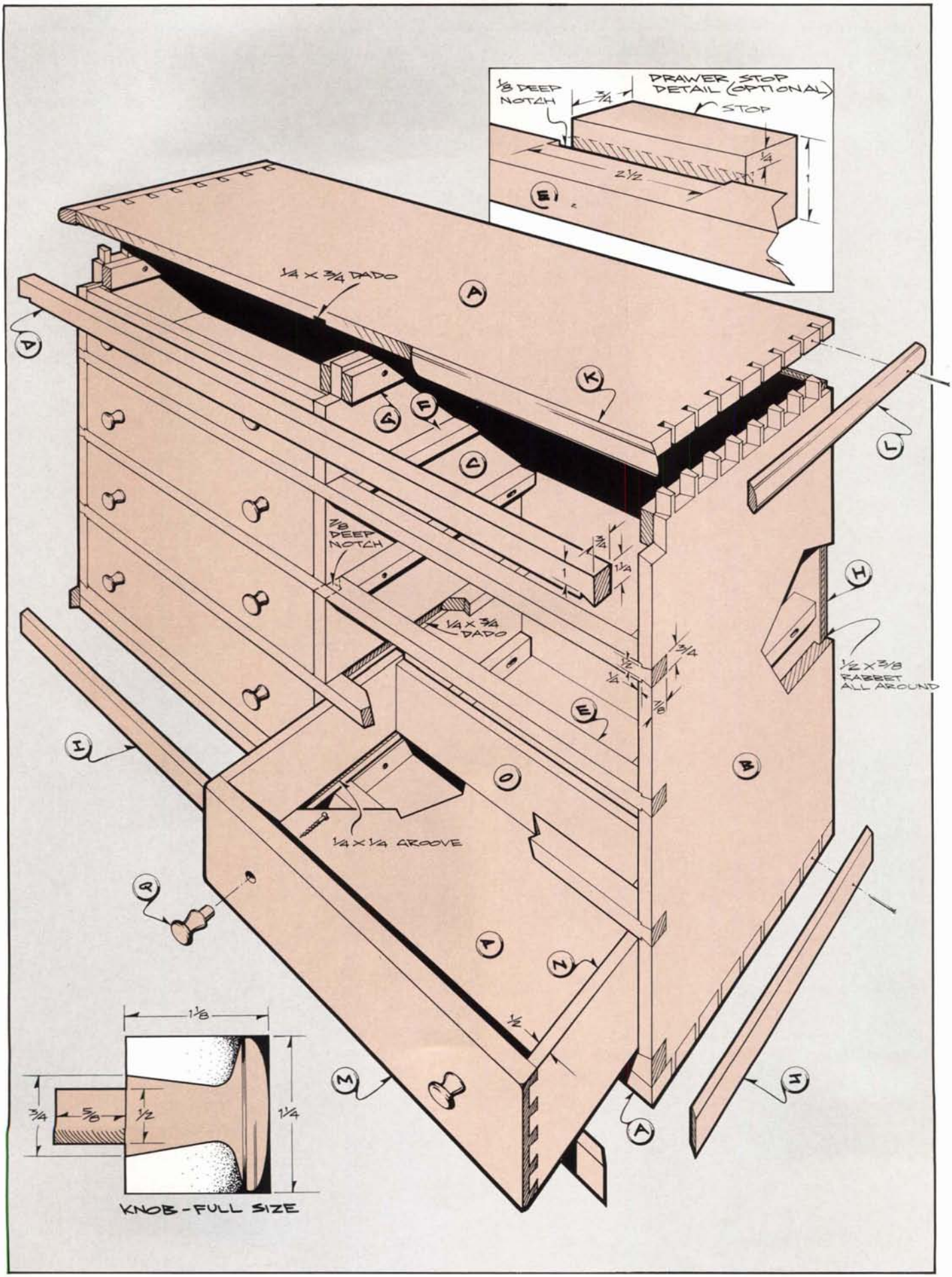
Start by edge-gluing enough material for the case top/bottom (A) sides (B) and divider (C). When dry, lay out and cut the various dadoes in the top, bottom, sides and divider, and the dovetails on the top and bottom and sides.

The dadoes are best cut with the router, using a straightedge clamped to the workpiece as a guide. Take some extra time and check your layouts before starting up the router. Remember, with this or any case piece, it's best to label the various parts and inside/outside faces to avoid confusion.

The dovetails on both the top and bottom are the same. Refer to the top view detail for the layout. A dovetail jig, if you have one, will speed the dovetail work. However, handcut dovetails are not hard to master, once you've got the technique down. You'll need a marking gauge, a combination square, several very sharp chisels, a coping saw, a sharp pencil or scribe, a good-quality dovetail saw and a mallet. Start by laying out the dovetail depths on the top, bottom and sides. Set the marking gauge for the actual thickness of the parts plus $^{1}/_{32}$ in.

Next, lay out the pins on the sides. Clamp the side securely in the bench vise and use the dovetail saw to establish the pin sides. Don't cut past the depth line that you established with the marking gauge. Now use the coping saw to cut away most of the waste. Stay just a


18 3/4
31 3/4
16 3/8
18
18 1/2
TOP VIEW DETAIL
DRAWER DETAIL
6 3/8
17 1/2
61 1/2
60
1/8 RAD. ROUND OVER
28 7/8
5
7 5/8
45°
61


⅛ DEEP NOTCH
¾
DRAWER STOP DETAIL (OPTIONAL)
STOP
¼
2½
E
¼ x ¾ DADO
A
K
F
D
L
⅛ DEEP NOTCH
¾
1
1¼
H
¼ x ¾ DADO
½
¼
⅛
¾
½ x ⅜ RABBET ALL AROUND
I
E
B
O
¼ x ¼ GROOVE
P
A
N
½
M
H
1⅛
¾
⅝
½
1¼
KNOB - FULL SIZE

little away from the depth line. Then remove the side from the vise and clamp it to your workbench so that it's sandwiched between a backup board beneath and a guide board above. The guide board, which is lined up with the depth line, gives you a surface to gauge the chisel against, and the backup board will help avoid chip-out as you clean out the waste. Don't try to get through the entire 3/4 in. thickness with the chisel in one blow. By using three or four sharp blows with the mallet you'll have more control, which should result in a nice clean cut.

Use the pins on each end of the sides as a template for marking the tails on the matching end of the top/bottom. Lay the top or bottom down on the workbench, and then stand the side up flush with the end. You may want to jig up a right angle with some scrap plywood to help with the positioning. The jig will also enable you to clamp the parts in the proper position, which makes marking much easier. Once the outline has been traced from the pins, transfer the lines to the end grain using a combination square.

Use the dovetail saw to cut the tails, staying on the waste side of the line. Then remove most of the waste as before with the coping saw. Finally, sandwich the top/bottom between the backing board and guide board, and clean out the remaining waste. Also cut the various notches in the divider, and the dovetail notches in the sides to accept the top/bottom and frame rails (D, E). Note that the shoulders of the frame rails fit into the dadoes that you cut earlier for the drawer guides, so there's nothing fussy about the frame rail dovetails. Cut the sides and bottom of these dovetails using the same procedure that you used for the case dovetails.

Now test-fit the case dovetails. If the fit is tight, use the chisel to pare back the pins a bit. If they don't seat fully, undercut the bottom of the flats between the pins, so they slope ever so slightly toward the inside of the case. The fit of the dovetails is important, since with a piece this large assembly takes some time. They should slide together and be a snug fit, but should not require pounding or hammering to assemble. Once glue is applied the wood will swell a bit. If the fit is tight before the glue is applied, then it will be impossible to assemble the joint after the glue is brushed on. By using a white instead of a yellow glue you'll gain a little more assembly time.

The dovetails on the ends of the top/bottom and frame rails are cut to fit the notches you cut earlier. After assembling these rails, cut and fit the drawer guides (F) and cleats (G). Note that both the drawer guides and cleats are sized to stop 1/4 in. short of the case back (H). Also, the holes toward the back on these pieces are slotted. The 1/4 in. space and slotted holes allow for wood movement across the 18 in. width of the sides. Without this allowance, if the guides and cleats were butted tight against the back and then the sides shrunk, either the back or the rails would be forced out.

Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
	Case		
A	Top/Bottom	3/4 x 18 x 60	2
B	Side	3/4 x 18 x 31 3/4	2
C	Divider	3/4 x 17 1/2 x 30 3/4	1
D	Top/Bottom Rail	3/4 x 1 1/4 x 60	2
E	Frame Rail	3/4 x 7/8 x 60	3
F	Drawer Guide	3/4 x 1 1/4 x 16 3/8	12
G	Cleat	3/4 x 1 1/4 x 16 1/2	8
H	Back	1/2 x 31 x 59 1/4	1
I	Base Front Mold'g	1/2 x 1 1/2 x 61	1
J	Base Side Mold'g	1/2 x 1 1/2 x 18 1/2	2
K	Top Front Mold'g	3/4 x 7/8 x 61 1/2	1
L	Top Side Mold'g	3/4 x 7/8 x 18 3/4	2
	Drawers		
M	Front	3/4 x 6 3/8 x 28 7/8	8
N	Side	1/2 x 6 3/8 x 17 1/4	16
O	Back	1/2 x 5 1/2 x 28 7/8	8
P	Bottom	1/4 x 17 x 28 3/8	8
Q	Knob	1 1/4 dia.	16

The back is 1/2 in. thick cabinet-grade plywood. The 1/2 in. by 3/8 in. rabbet for the back is cut using the router equipped with an edge-guide and rabbeting bit. Stop the cut at the inside corners. You can either square the corners of the rabbet using a chisel, or round the corners of the back to match the bit radius. Use screws and glue to apply the back.

The top molding is just a 3/4 in. by 7/8 in. strip, with a 1/8 in. roundover on the top and bottom edges. Glue the front molding (K) along its full length, but to allow for movement, use glue only on the front and at the miters for the side moldings (L). Finish-nail the back of the side molding, then set the nails and fill the holes before painting. The base moldings (I, J) are applied in the same way. Note that the top edge of the base moldings is ripped at a 45-degree angle.

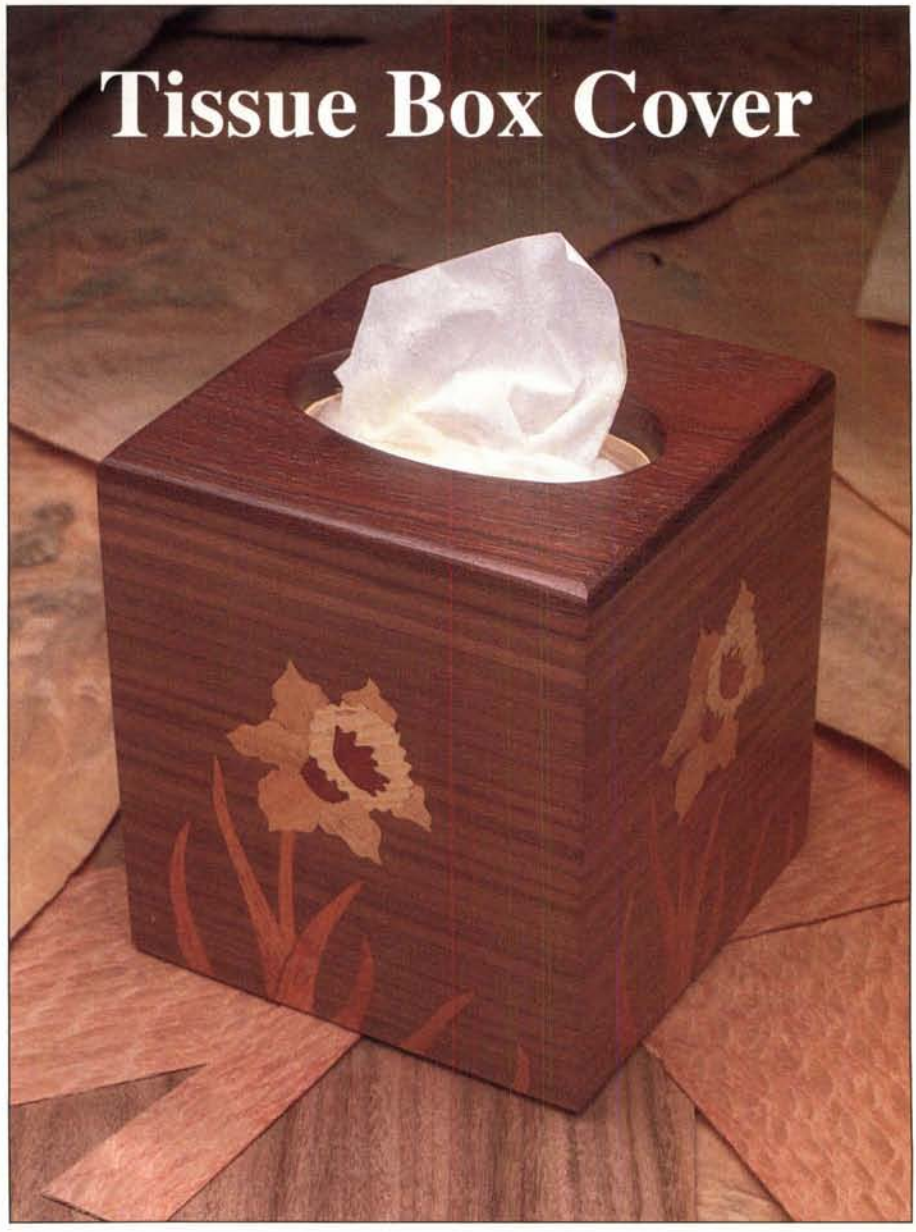
You can use our dovetail layout (see drawer detail) for the drawers, or go with a simple rabbeted construction if you prefer. In any event, only the drawer fronts (M) need be butternut. A secondary wood, such as birch or poplar, can be used for the sides (N) and backs (O). The drawer bottoms (P) are 1/4 in. hardwood plywood, fitted into a 1/4 in. by 1/4 in. groove in the front and sides. Use several screws up through the bottom into the back to prevent sagging. You'll note that the drawers are sized for an exact fit in the case, as dimensioned in the Bill of Materials. In practice, you should allow at least a 1/16 in. gap at the top of the drawer fronts, so they won't bind in the case if they swell a little. The drawers stop against the case back. If the case shrinks a little during the winter months, then the drawers will show a little proud at the front. If the case expands a little during the summer, then the drawers will be inset a bit. If this bothers you, size the drawers so they stop 1/4 in. short of the back, and mount stops on the back edges of the rails. Since the frame rails are 7/8 in. wide, you'll need to notch out 1/8 in. deep on their back edge for the stops (see Drawer Stop detail). The bottom rail, which is 3/4 in. wide, does not need to be notched for the stop. Use two stops for each drawer.

The knobs (Q) can either be turned from walnut, as shown in our full-size pattern, or you can order a similar knob from Woodcraft Supply Corp., 210 Wood County Industrial Park, Parkersburg, WV 26102. Order their part no. 50L51 for a bag of 10 maple knobs ($4 postpaid). You'll need two bags since 16 knobs are required. You can dye or stain the maple knobs to look like walnut, or Woodcraft also sells the same size knob in cherry.

We like the combination of a milk-paint finish and natural drawer fronts, and milk paints are available in many lovely colors. They can be ordered from The Old-Fashioned Milk Paint Company, Box 222, Groton, MA 01450. Use an oil finish on the drawer fronts.

Since the flat bottom of the case rests directly on the floor, levelers will be needed if your floors are uneven. For the adjustable levelers you'll need to add blocks on the inside of the case to provide the required mounting thickness. Levelers are available at most hardware stores. WWJ

Tissue Box Cover



Dressed-up tissue boxes are hardly a novel idea, but our cover goes the standard color-printed cardboard box one better. In addition to providing an attractive sleeve for a standard 4 1/2 in. square by 5 1/4 in. high tissue box, it lends the box a little added weight. No longer will you need two hands to extricate a stubborn tissue.

The box couldn't be any simpler to make. The ends (A) and sides (B) are 3/8 in. thick hardwood plywood. Baltic birch plywood is ideal, if you have some. The two ends butt to the two sides. Just be sure that your cuts are accurate and square. Then apply a generous coat of glue, and clamp securely. When dry, sand the box as needed to remove any burrs or glue at the butt joints and corners.

The next step is to apply the marquetry veneer (D). The Special Techniques article on page 21 tells you how to create the floral pattern shown on our box. Feel free to create your own marquetry picture — or just use an attractive veneer alone if you don't feel up to the marquetry.

Whether you use our pattern, or a veneer alone, at this point you should have the four sides of veneer assembled face-down on contact paper. The overall size of each of the veneer sides should be about 6 in. by 6 in. The extra is trimmed after the veneer has been applied to the box.

The veneer is glued to the box two sides at a time. Use yellow glue, presser boards, and five clamps (Fig. 1). This may seem like a lot of clamps to use for such a small piece, but it's important that the veneer be glued firmly, especially at the edges. If it's not, there's the chance of chipping out. The presser board is simply 3/4 in. thick particleboard cut to 6 in. square. It serves to distribute the clamp pressure to the entire veneer surface. When the glue is dry, remove the clamps and presser boards, and use the veneer saw to trim the excess (Fig. 2). Cut cross-grain first, then with the grain.

Using the same process, apply the two remaining sides of veneer. But when you do the final trimming, angle the veneer saw ever so slightly away from the box side to avoid scratching the marquetry. Our box top (C) is 3/8 in. thick walnut, matching the walnut veneer used as a background for the marquetry. The top has a 3/16 in. deep by 3/8 in. wide rabbet all around. Baltic birch plywood is measured in millimeters, and actually measures a little under 3/8 in. thick, so even with the addition of the veneer the 3/8 in. rabbet width was adequate. If you use some other plywood, you may need to cut the rabbet a little wider in order to accommodate both the plywood and veneer.

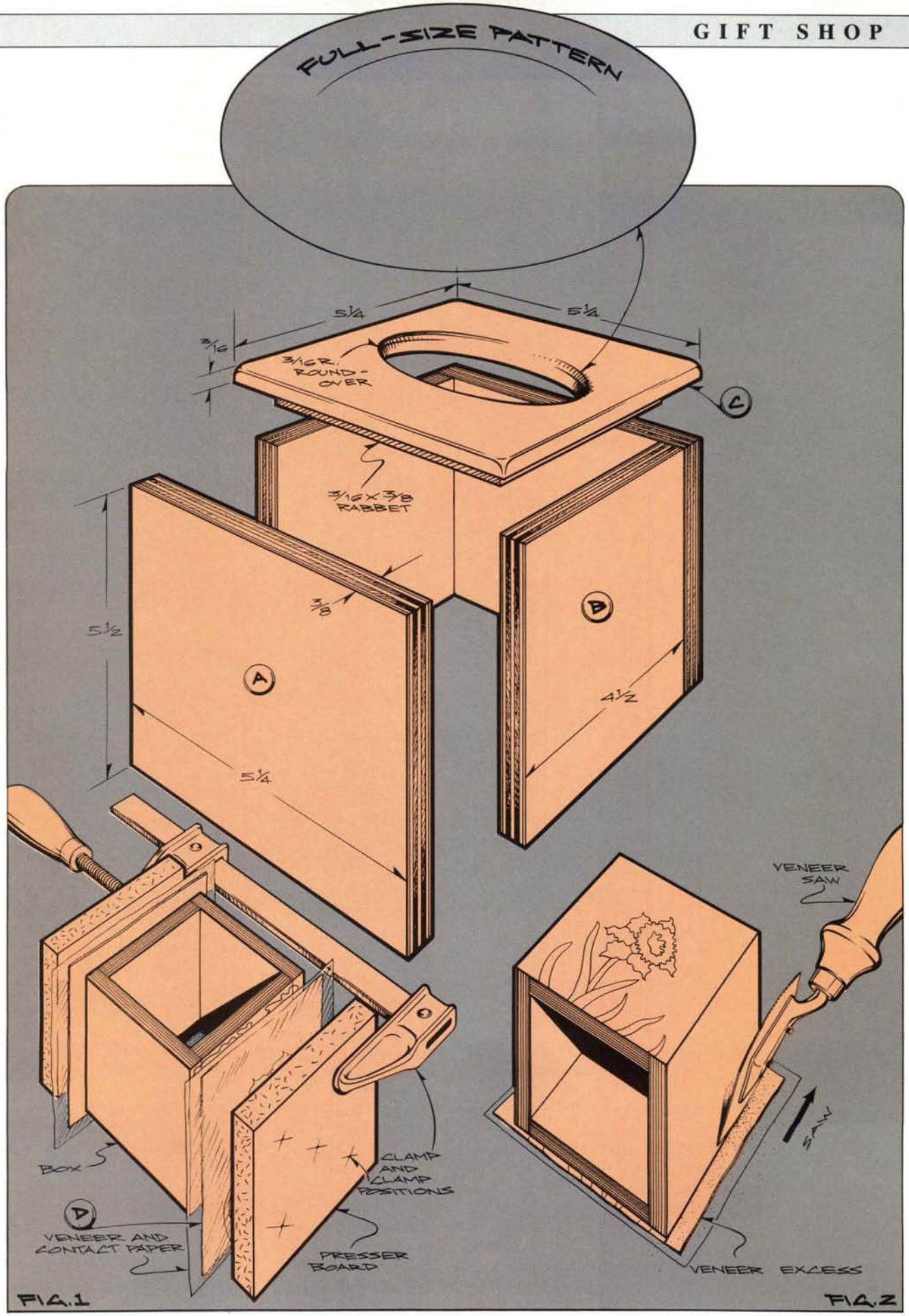
Refer to the full-size pattern for the tissue hole oval. The edges of the oval are rounded on the router table, using a 3/16 in. radius bearing-guided roundover bit. The edges of the top are broken slightly, but take care not to sand the corners of the box, lest you break through the veneer.

To finish the veneer, first sand it very lightly with 120-grit paper. Again, stay away from the corners. Vacuum up all dust. Next, mix up some wood dust with glue, and fill any seams in the marquetry. If you prefer, instead of the wood dust and glue mixture, you can substitute colored wax sticks. Sand the box lightly with 150-grit paper, and then finish with either oil or lacquer.

Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
A	End	3/8 x 5 1/4 x 5 1/2	2
B	Side	3/8 x 4 1/2 x 5 1/2	2
C	Top	3/8 x 5 1/4 x 5 1/4	1
D	Veneer	6 x 6*	4

* Veneer is oversize to allow for final trimming.


FULL-SIZE PATTERN
5¼
5¼
3/16
3/16 R. ROUND-OVER
C
3/16 x 3/8 RABBET
3/8
5½
A
B
4½
5¼
BOX
D
VENEER AND CONTACT PAPER
CLAMP AND CLAMP POSITIONS
PRESSER BOARD
FIG.1
VENEER SAW
SAW
VENEER EXCESS
FIG.2

Band-Sawn Napkin Holder

This stylish napkin holder will make an attractive addition to any dining room setting. In use, the angled bottom makes the two halves tip together so the napkins stay neatly in place. The leather acts as a hinge.

Brad and Sandy Smith, owners of Bradford Woodworking in Worcester, Pennsylvania, were kind enough to share their design with us. It's a good seller at the many craft shows they attend throughout the country.

The procedure for making the piece is shown on the facing page. Begin by cutting 1 3/4 in. thick stock to 2 3/4 in. wide by 14 in. long. We use cherry, but just about any wood can be used.

Using the full-size pattern provided, trace the profile on the stock as shown. Once traced, use a band saw to cut out the profile (but don't cut the 13-degree angle yet), taking care to stay slightly on the waste side of the line. Sand the band-sawn surfaces, starting with 80-grit, followed by 120-, 180-, and 220-grits. If you have one, a drum sander will come in handy here.

The table saw is used to cut the 13-degree angle on the bottom end of each half. Before starting, though, it's a good idea to make an auxiliary wooden fence for the miter gauge. The fence should be made from flat, straight stock (plywood is a good choice), and it should be long and high enough to support the project stock. For a Sears 10 in. table saw, a fence that's about 3/4 in. thick by 2 1/2 in. wide by 12 in. long will work just fine. Use wood screws to firmly secure it to the miter gauge.

Now, set the table saw blade to make the 13-degree angle shown. Also, set the blade to a height of 1 7/8 in. If your blade tilts to the left (when viewed from the front of the saw), you'll need to use the right hand miter gauge slot for this step. If your saw blade tilts to the right, use the left hand slot. Our illustration shows a saw with a blade that tilts to the left, so the miter gauge is in the right hand slot.

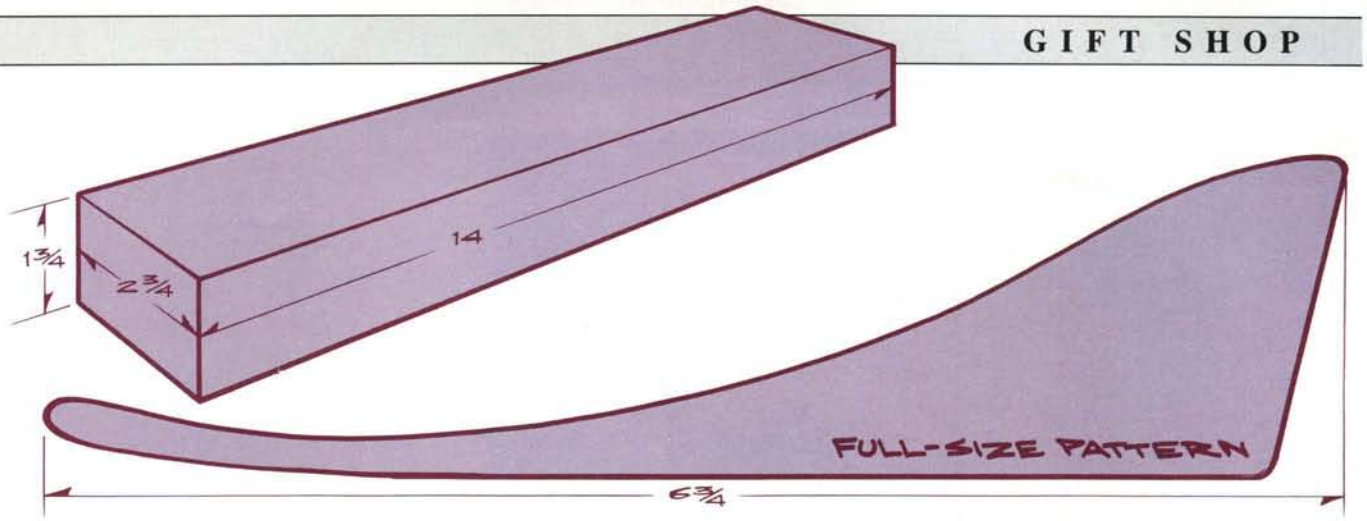
Next, clamp a stopblock to the auxiliary fence. Locate the stopblock so that, when the stock is crosscut, it establishes the 6 3/4 in. length of each napkin holder half. Hold the stock firmly against the miter gauge auxiliary fence and the stopblock, then crosscut the stock to get one of the halves. Use the same procedure to cut the other half to length.

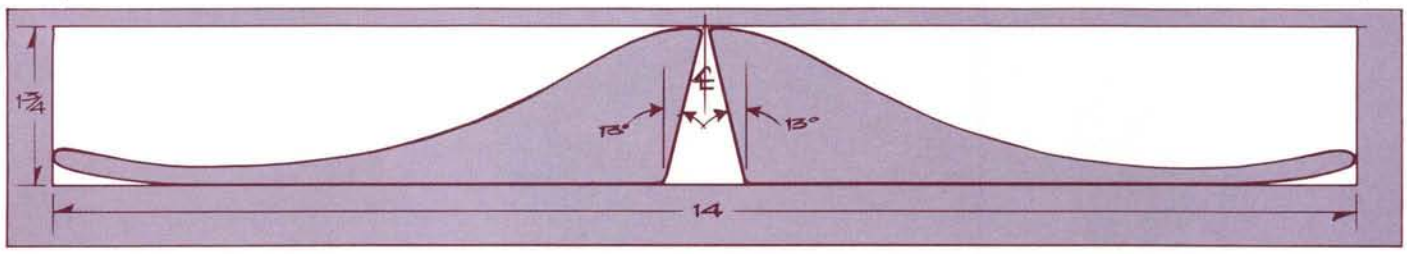
In order to provide a means to securely attach the leather, you'll first need to cut a 1/8 in. wide by 3/8 in. deep by 2 3/8 in. long stopped dado in each half. This is best done with a router table and a 1/8 in. diameter straight bit. You'll also need a pair of stopblocks.

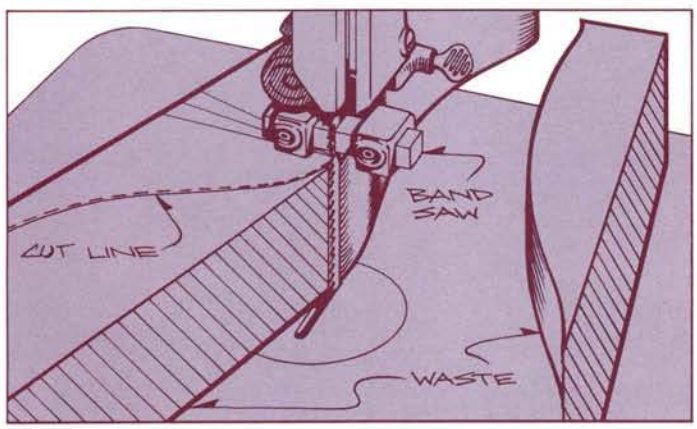
To make the dado, set the bit to a height of 1/8 in. and secure the router table fence 5/8 in. from the bit as shown. Also, clamp the stopblocks to the fence, locating them 2 1/2 in. on each side of the router bit center line (see Top View of Router Table). Start the router and, while holding the stock on the table at an angle (see End View — Dado Cut), butt the end against the fence. Slowly lower the stock into the bit, then cut the 2 3/8 in. long dado using the stopblocks to control the length. To complete the dado, you'll need to repeat the process two more times, once with the bit set 1/4 in. high, and once with the bit set 3/8 in. high. (Making the 3/8 in. deep dado cut in three steps results in a smoother cut with less burning.)

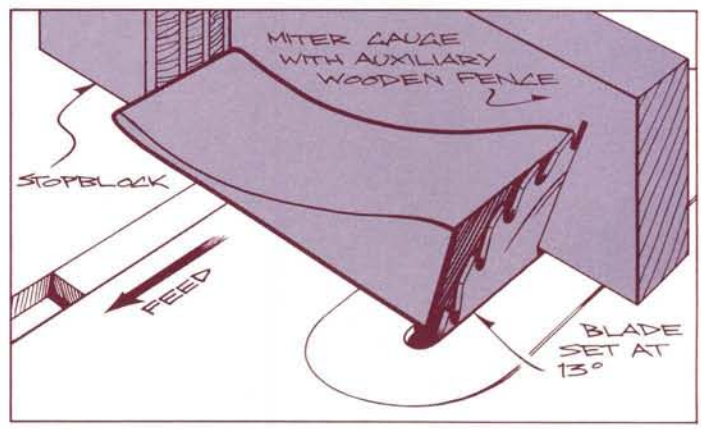
You'll need some leather to make the hinge. Just about any kind will do as long as it's flexible enough to permit the two halves of the holder to tip together. If you don't have a local source, you can get leather via mail-order from the Tandy Leather Company, P.O. Box 791, Fort Worth, TX 76101. We ordered their "Half Back" (part number 4130) which is a piece of 1/16 in. thick leather measuring 3 1/2 in. wide by 4 5/8 in. long. The price is 98 cents each plus 50 cents shipping and handling. We cut it into two pieces, each one measuring 2 1/4 in. wide by 3 in. long, then the two pieces were glued together to get a thickness equal to the 1/8 in. wide dado cut. White glue does a good job bonding leather.

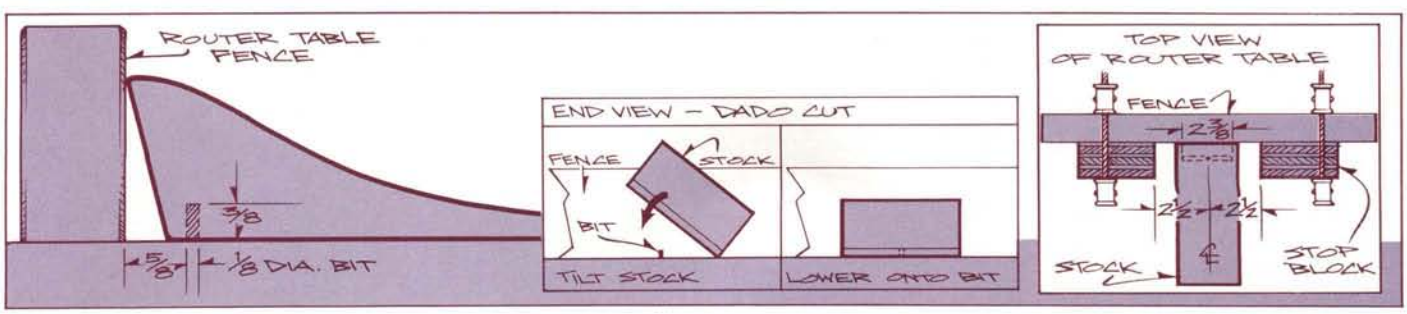
The two halves of the napkin holder can now be final sanded. When smoothed to your satisfaction, glue the ends of the leather into the dado. Use white glue and allow to dry thoroughly. To complete the project, apply two coats of a good penetrating oil.

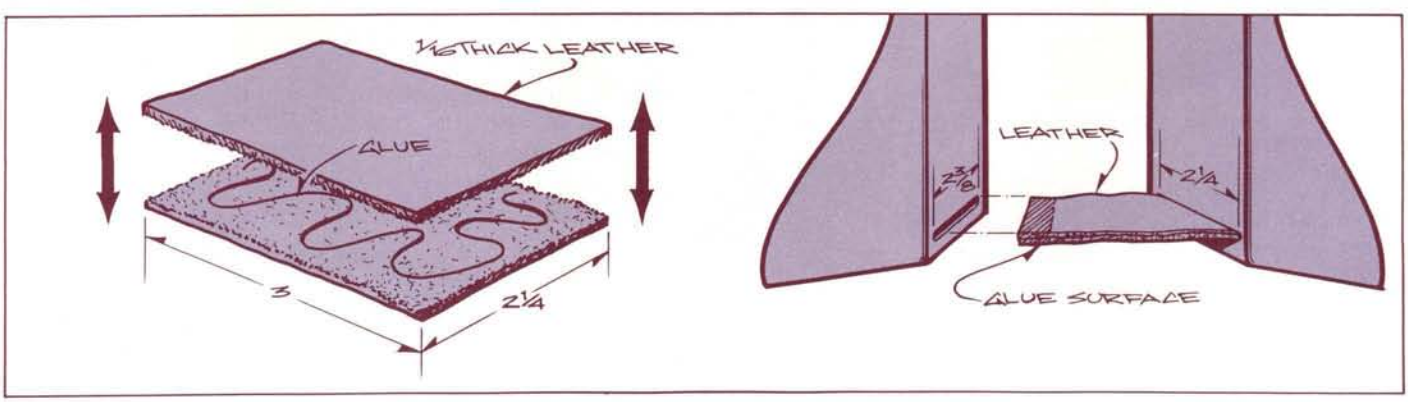

1 3/4
2 3/4
14
FULL-SIZE PATTERN
6 3/4

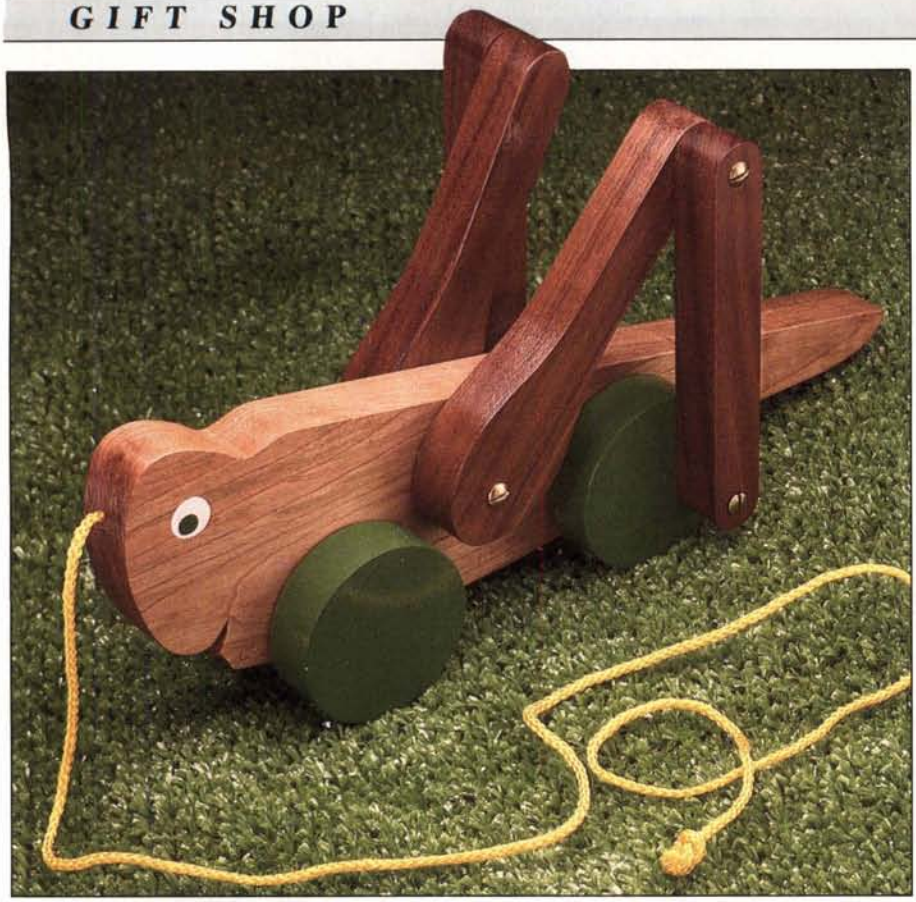

1 3/4
15°
15°
14


BAND SAW
CUT LINE
WASTE


MITER GAUGE WITH AUXILIARY WOODEN FENCE
STOPBLOCK
FEED
BLADE SET AT 15°


ROUTER TABLE FENCE
3/8
5/8
1/8 DIA. BIT
END VIEW - DADO CUT
FENCE
STOCK
BIT
TILT STOCK
LOWER STOCK TO BIT
TOP VIEW OF ROUTER TABLE
FENCE
2 3/8
2 1/2
2 1/2
STOCK
STOP BLOCK


1/16 THICK LEATHER
GLUE
3
2 1/4
LEATHER
2 3/8
2 1/4
GLUE SURFACE

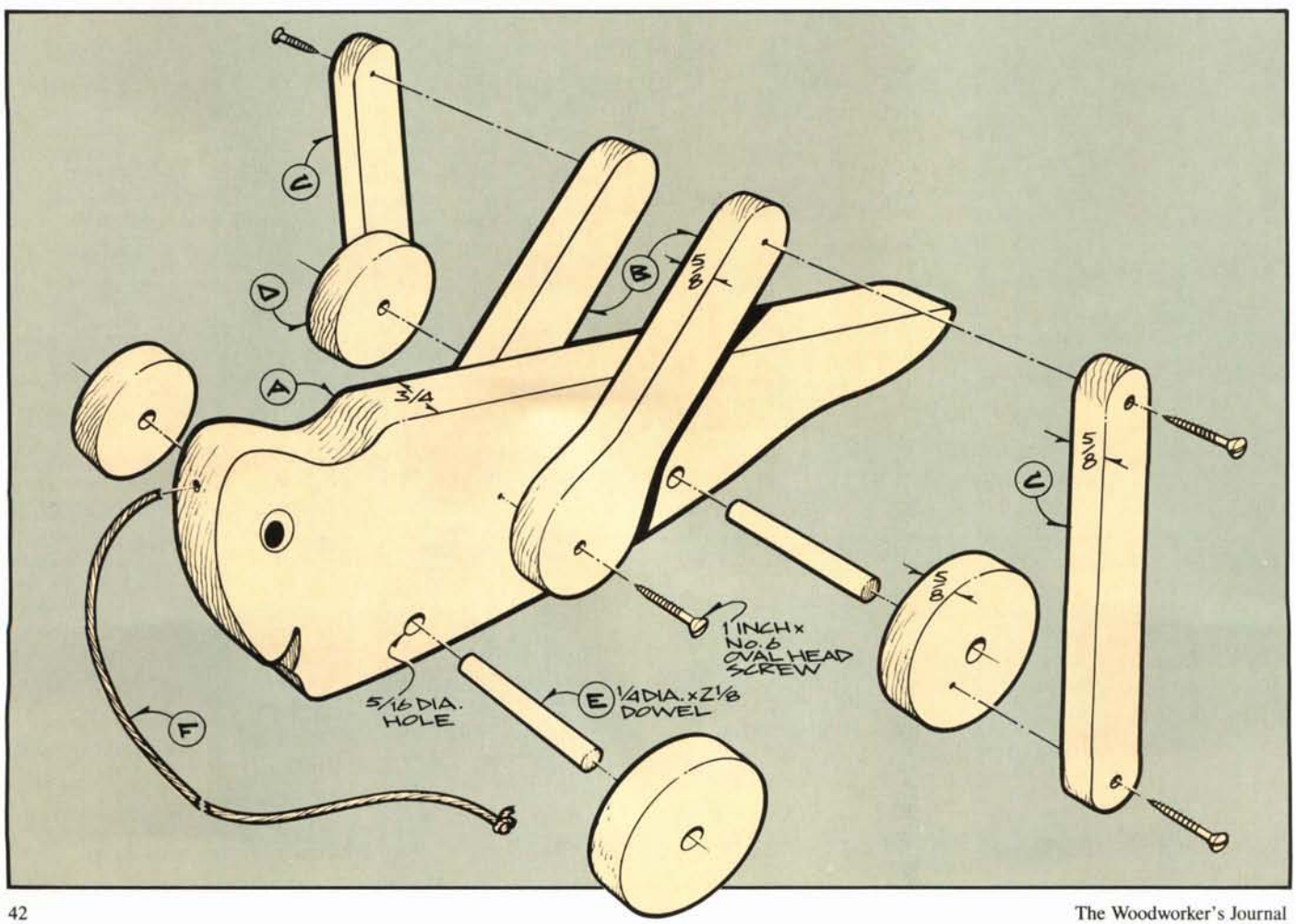


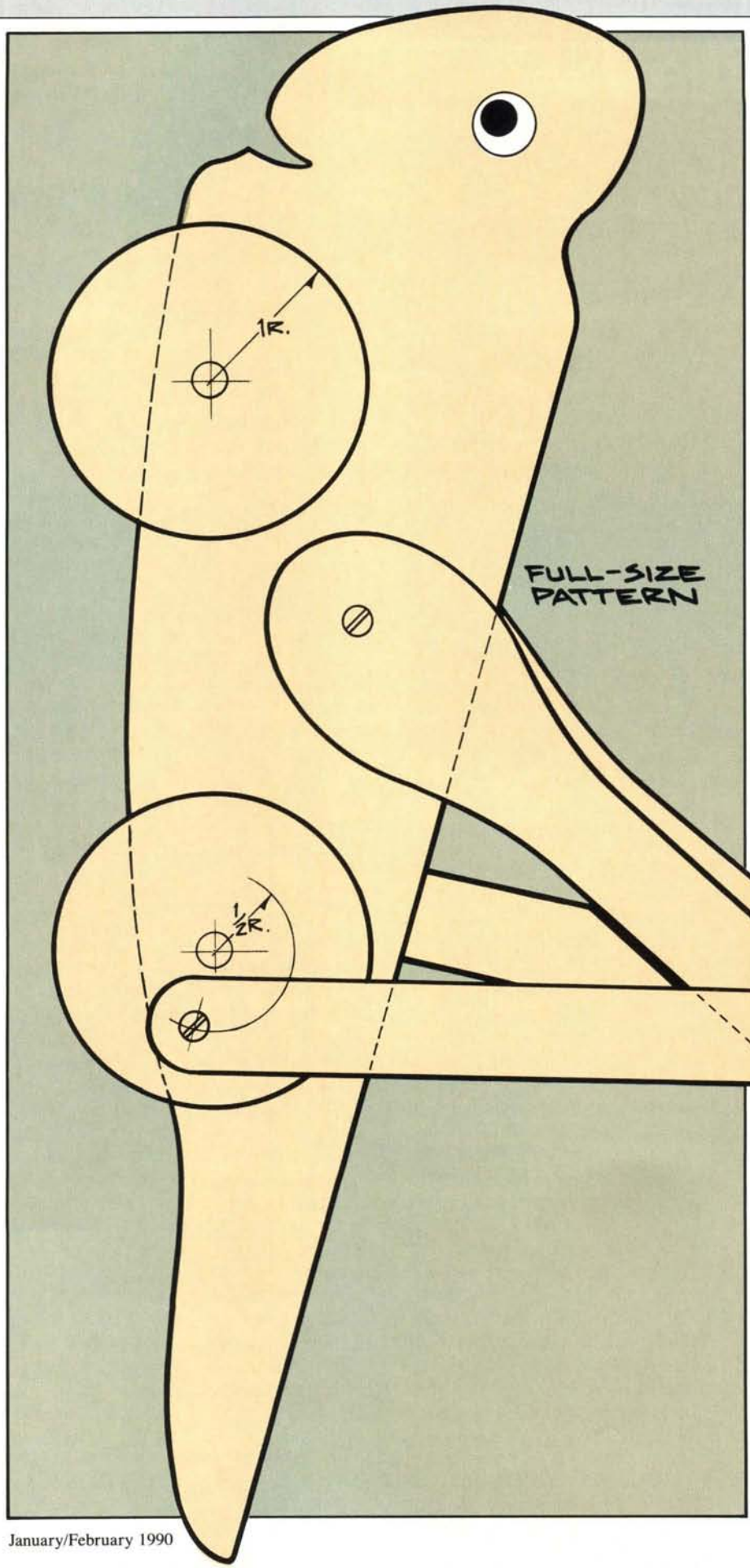
Grasshopper Pull Toy

When in close proximity to this Grasshopper Pull Toy, small faces tend to break out in wide smiles. Even adults may have trouble suppressing little muscles pulling at the corners of the mouth. It's altogether too goofy looking to take with a straight face.

The little grasshopper is also sure to give the builder a few hours of relaxation in the shop. It's a nice break from more challenging projects. All you need is a few scraps of wood and some dabs of paint. Almost any kind of wood will do for a small toy like this.

We used maple for the wheels and body, and walnut for the legs. But the





choices aren't based on anything except what floated to the top of the scrap bin.

The body (A) is 3/4 in. thick stock, while the legs (B and C) and wheels (D) are 5/8 in. thick. Lay out the body and legs using our full-size pattern. Use a band saw or a scroll saw to do the actual cutting.

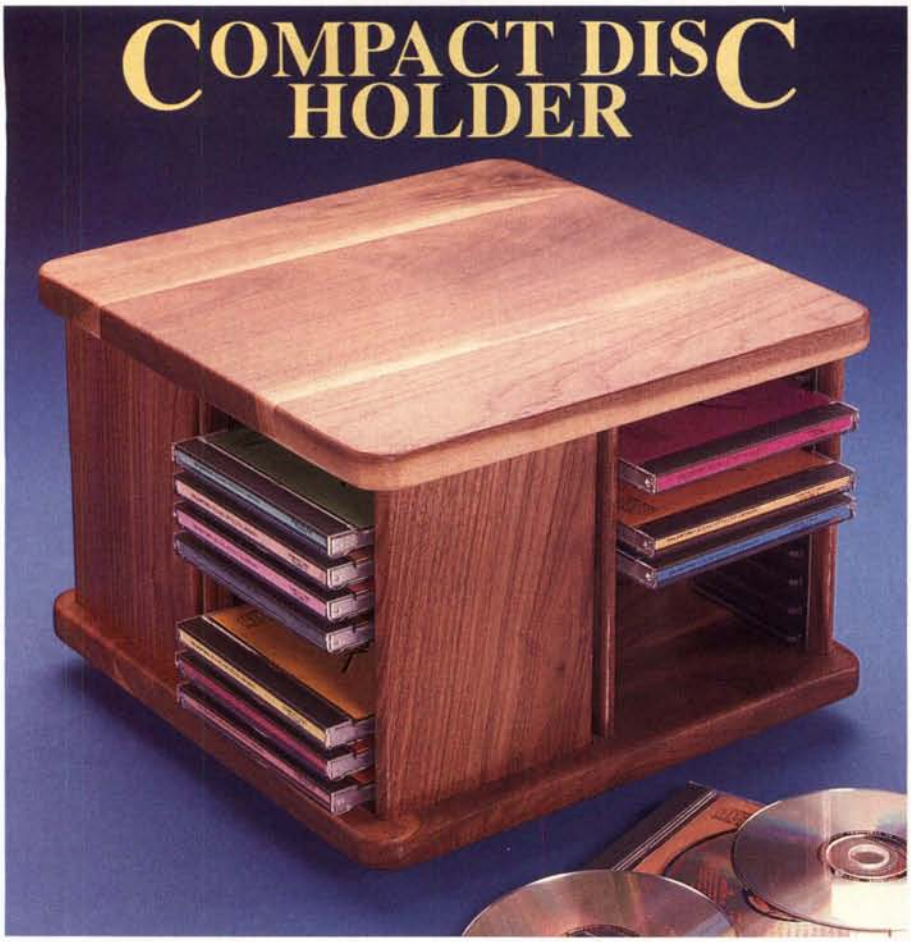
The four wheels each have a 1 in. radius. On the rear wheels, also scribe a 1/2 in. radius to use when locating the eccentric connection to the leg. While you're at it, also locate and drill 5/16 in. diameter holes for the axles (E), as well as the pilot holes for the screws in the legs and body. The axle is 1/4 in. diameter, but the axle hole is slightly oversized to allow for easy movement. Also drill a 1/8 in. diameter hole in the head for the string (F).

Next give all the parts a good sanding. Start with 120-grit paper, then go to 180- and 220-grit. Make sure all the edges are well rounded. You may have to use a knife file to smooth the inside of the mouth.

Next apply the paint. We used green enamel for the wheels, and white and green enamel for the eyes. You can refer to our full-size pattern again to locate the eyes. Note that the wheels are painted before they're glued onto the axles and attached to the toy. That way you won't get paint on the body, which is left unfinished or oiled.

The axle dowel itself is 2 1/8 in. long to allow for some play between the body and the wheels. When gluing on the wheels, make sure the pilot holes for the leg screws are opposed 180 degrees. Also, the screws in the wheels and legs aren't snugged up, so the legs are free to move. After putting the toy together, you will need to touch up the axle where it goes through the wheels. For a final step, glue the pull string into the hole.

COMPACT DISC HOLDER



It doesn't seem so very long ago (our November/December 1986 issue) that we featured plans for a Cassette Tape Holder. Now, only three years later, we're offering plans for a Compact Disc (CD) Holder. Time and technology march on. Interestingly, though, the construction of both the CD Holder and our earlier Cassette Tape Holder are loosely based on an old and venerable design — a traditional Early American revolving bookcase.

This CD holder, made from walnut, was designed and built by California woodworker Peter Doyle. Doyle's company, P & D Wood Designs, specializes in making CD holders. While the design of this CD holder is ideally suited to a production shop, it's also easy to make for the craftsman who's interested in building only one.

There are three different wooden parts, the top/bottom (A), the partitions (B) and the base (C). The swivel (D) and the inserts (E) are available from P & D Designs (see Bill of Materials for ordering information).

You'll need to edge-glue stock for the top/bottom. The best way to do this is to edge-glue boards that are about 24 in. long. When dry, crosscut to yield the top and bottom.

The slots in the top/bottom for the partitions are cut with the router and a 5/16 in. diameter straight bit. In a production shop you'd make a template and then use a bushing in the router base to cut these slots. The same template would be used for both the top and bottom. It's just flipped so the opposite face is up. But for only one CD holder you'd have finished the whole project by the time you got the template made. Therefore it's best to cut these slots using the router and edge guide.

First, cut the top/bottom to final size. But don't round the corners or sand the edges yet. Now lay out the slots. Be sure to mark where they start and stop.

You'll need to use two separate settings of the edge-guide to cut the slots. The slots nearest the edge are cut with the edge-guide located 1/2 in. from the cutter. The remaining slots are cut with the edge-guide located 5 7/8 in. from the cutter. Note that the edge-guide bears off the same edge for each parallel pair of partitions. This way, even if the edges of the top and bottom aren't parallel, or if the top and bottom don't measure exactly 11 1/2 in., the partitions for each stack of CD's will still be parallel and located exactly 5 1/16 in. apart. Be careful to make the top and bottom as mirror images. If you make them identical, then the slots won't line up. As shown, the bit depth is 3/8 in. If you have a light-duty router, you'll need to achieve the 3/8 in. depth in two passes. Take care not to run past your end marks, or gaps will show when the holder is assembled.

Once your slots have been cut, use the band saw to rough out the 3/4 in. radius corners. Then final sand to smooth the corners and break all sharp edges.

The best way to get the 5/16 in. partition thickness is to resaw 3/4 in. thick stock on the band saw. Plane and sand the resawed faces as needed to remove the saw marks, and then use a belt sander to bullnose the edges. Keep in mind that you want a close fit, but not one so tight that you have to fight to get the parts together. When assembling the holder, it helps if the partitions slide easily into the slots in the top and bottom. Don't use a lot of glue here, or you'll be spending a lot of time cleaning up the squeeze-out. Glue all the partitions into the bottom first, and then add the top, but without any glue. The top holds the partitions in place while the glue dries. Later, the top is glued in place.

The base is cut to 5 3/4 in. square, and mortised to accept the swivel. This mortise results in less of a gap between the holder and base than if you simply screwed the swivel in place with no mortise. Note the screw access hole through the base. The hole enables you to screw the swivel up into the bottom after it's been fastened to the base. Without the hole you wouldn't be able to access the screws. Pre-boring the screw holes in the bottom makes the job of mounting the base a little easier.

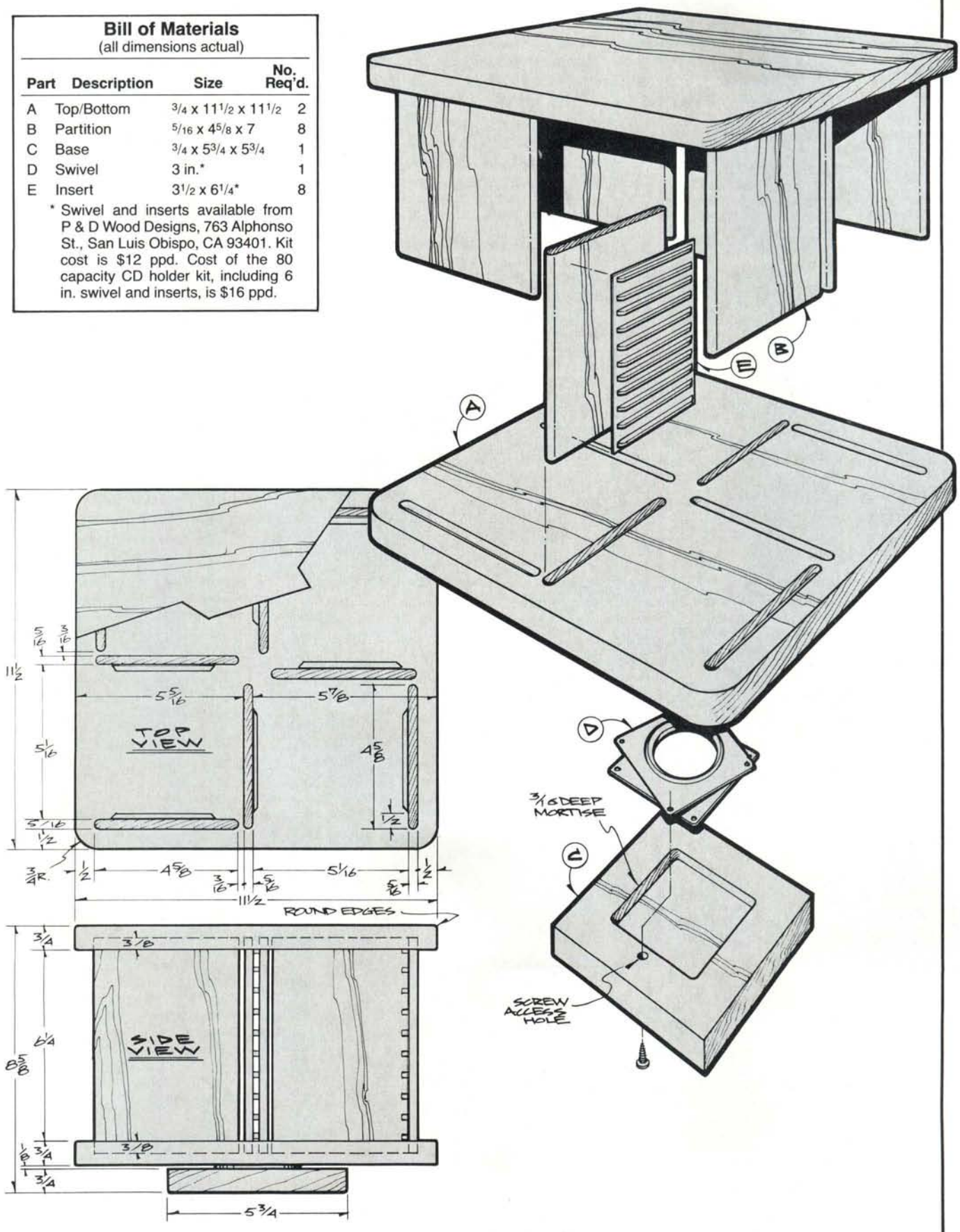
After applying an oil finish, you are ready to mount the inserts. They come with an adhesive backing, and are just pressed in place. Keep the opposite sides level so your compact discs are held level.

This holder stores 40 CD's. P & D Wood Designs also offers a 6 in. swivel and longer inserts if your collection is larger. Just increase the length of the partitions by 6 in. and the size of the base to 8 in. square (to accept the larger swivel), and you'll have a holder that will accommodate 80 discs. WWJ

Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Top/Bottom	3/4 x 11 1/2 x 11 1/2	2
B	Partition	5/16 x 4 5/8 x 7	8
C	Base	3/4 x 5 3/4 x 5 3/4	1
D	Swivel	3 in.*	1
E	Insert	3 1/2 x 6 1/4*	8

* Swivel and inserts available from P & D Wood Designs, 763 Alphonso St., San Luis Obispo, CA 93401. Kit cost is $12 ppd. Cost of the 80 capacity CD holder kit, including 6 in. swivel and inserts, is $16 ppd.

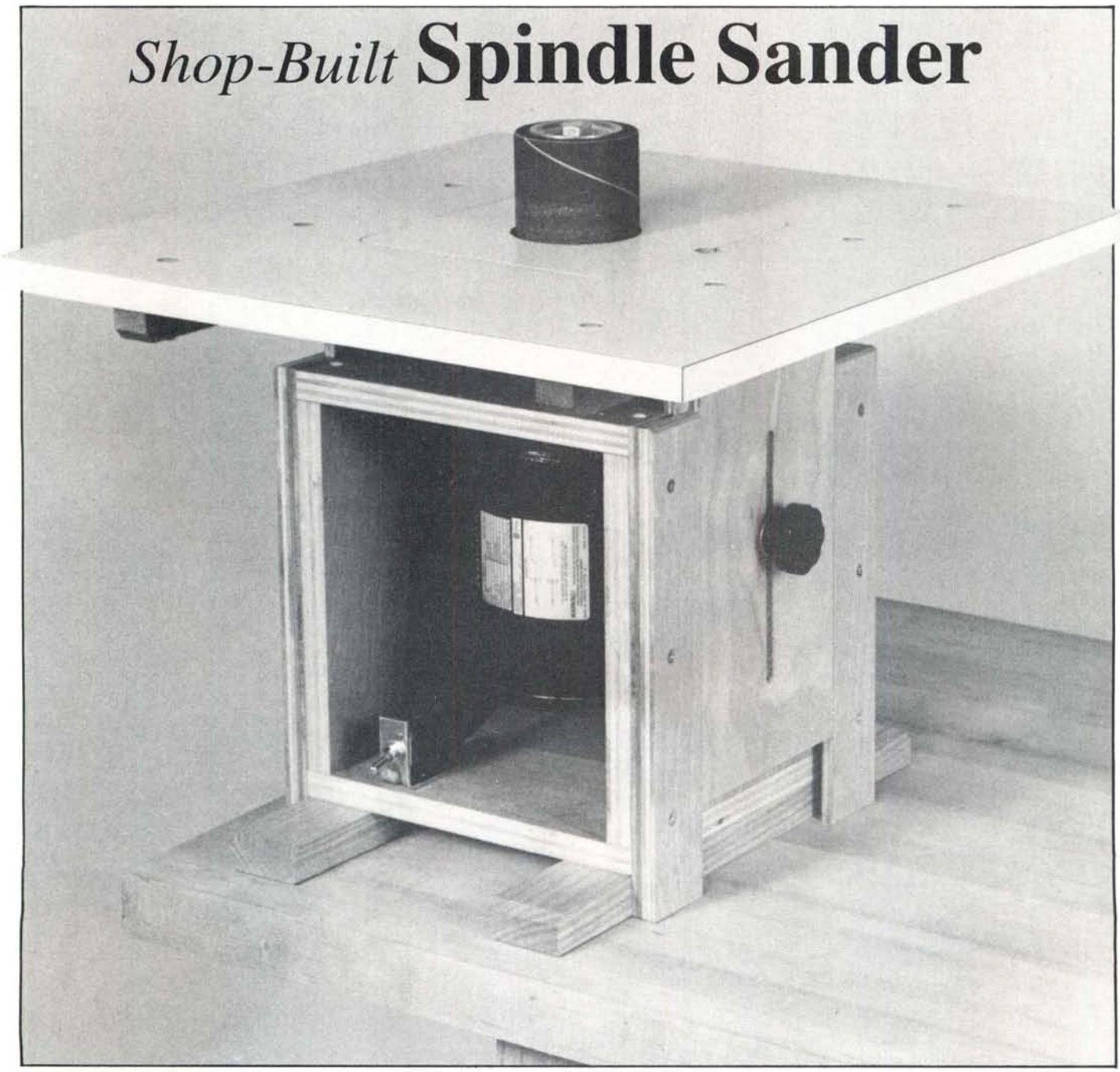


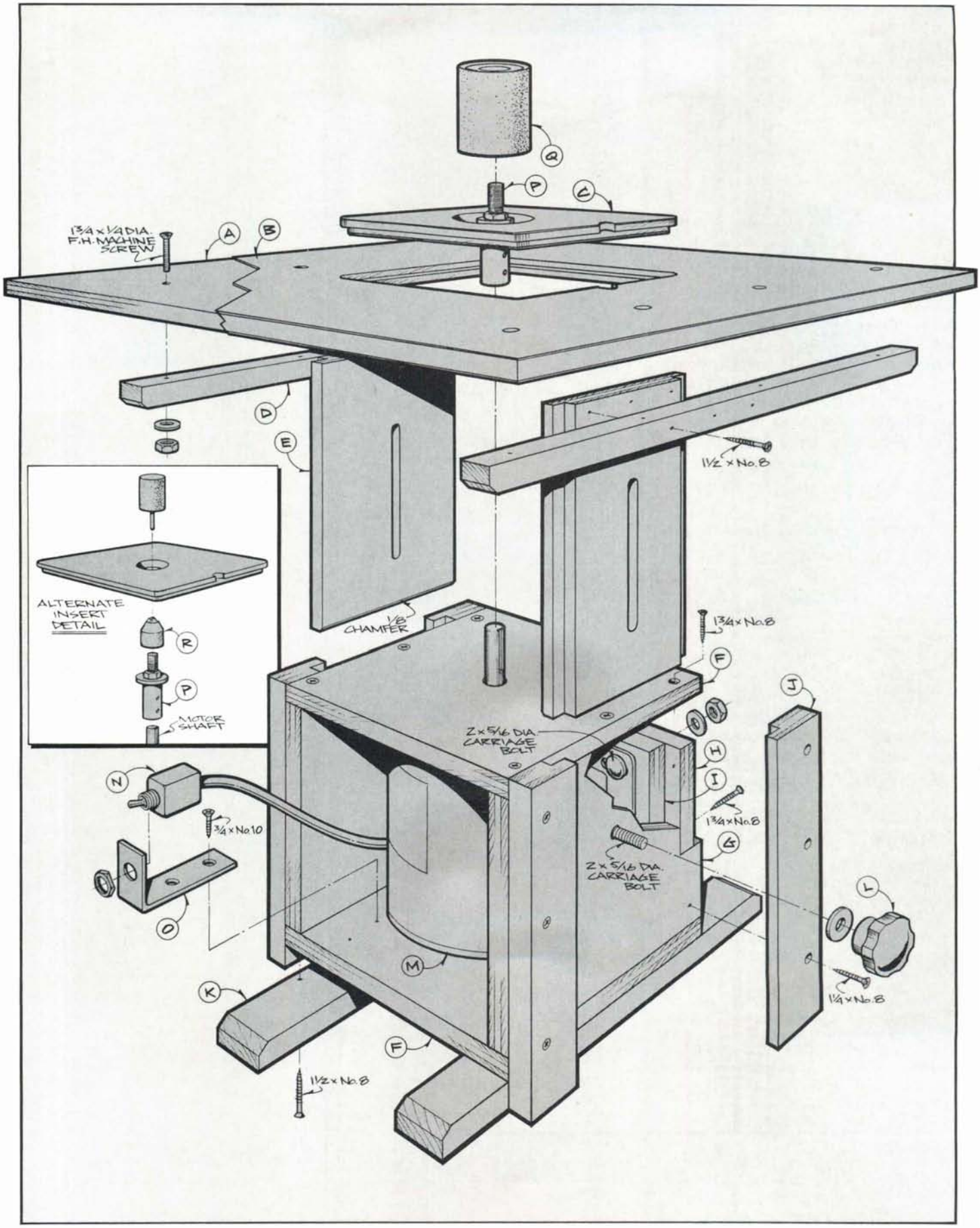
Shop-Built Spindle Sander

The availability of inexpensive sanding drums has made possible the construction of low-cost shop-built spindle sanders. Our design takes the simple motor-in-a-box spindle sander one step further. Its adjustable table and replaceable insert enable the owner to use any number of different size and design sanding drums, from shaft type to threaded. All that's required to convert from the large 3 in. diameter threaded drum to the shaft-type drums is the addition of the screw-on chuck (part R). A source for the shaft-type drums, in addition to the arbor (P), the 3 in. diameter drum (Q) and the chuck is given in the Bill of Materials.

Start with the top (A). We used cabinet-grade birch plywood for this and all other wood parts, except the cleats (D) and feet (K), which are hardwood. After cutting the top to 20 in. square, make your cutout for the insert (C). First we marked out the perimeters of the 7 1/4 in. square cutout. Next, we drilled a starter hole for the jigsaw blade inside the cutout, and used the jigsaw to cut out most of the waste, staying just off the line. Then we clamped guide boards in place, using our 7 1/4 in. perimeter lines as a guide, and flush-trimmed the cutout to the 7 1/4 in. square dimension. A laminate trimmer, if you have one, is a little easier to use than the router. The ball-bearing guided flush trimmer bit won't get into the corners of the cutout, so they'll remain rounded.

Next, cut your inserts to size, 8 in. square. We only show one insert, but you should make an insert for each size sanding drum that you use. Use the router equipped with a 3/8 in. ball-bearing guided rabbeting bit to cut the 3/8 in. by 3/8 in. rabbets in the top and inserts. Then, using a file, round the




1¾ x ¼ DIA. F.H. MACHINE SCREW
A
B
Q
P
C
D
E
1½ x No.8
ALTERNATE INSERT DETAIL
R
P
MOTOR SHAFT
⅛ CHAMFER
1¾ x No.8
F
J
2 x 5/16 DIA CARRIAGE BOLT
H
I
1¾ x No.8
G
2 x 5/16 DIA. CARRIAGE BOLT
N
¾ x No.10
O
L
M
K
1¼ x No.8
F
1½ x No.8

Bill of Materials
(all dimensions actual)

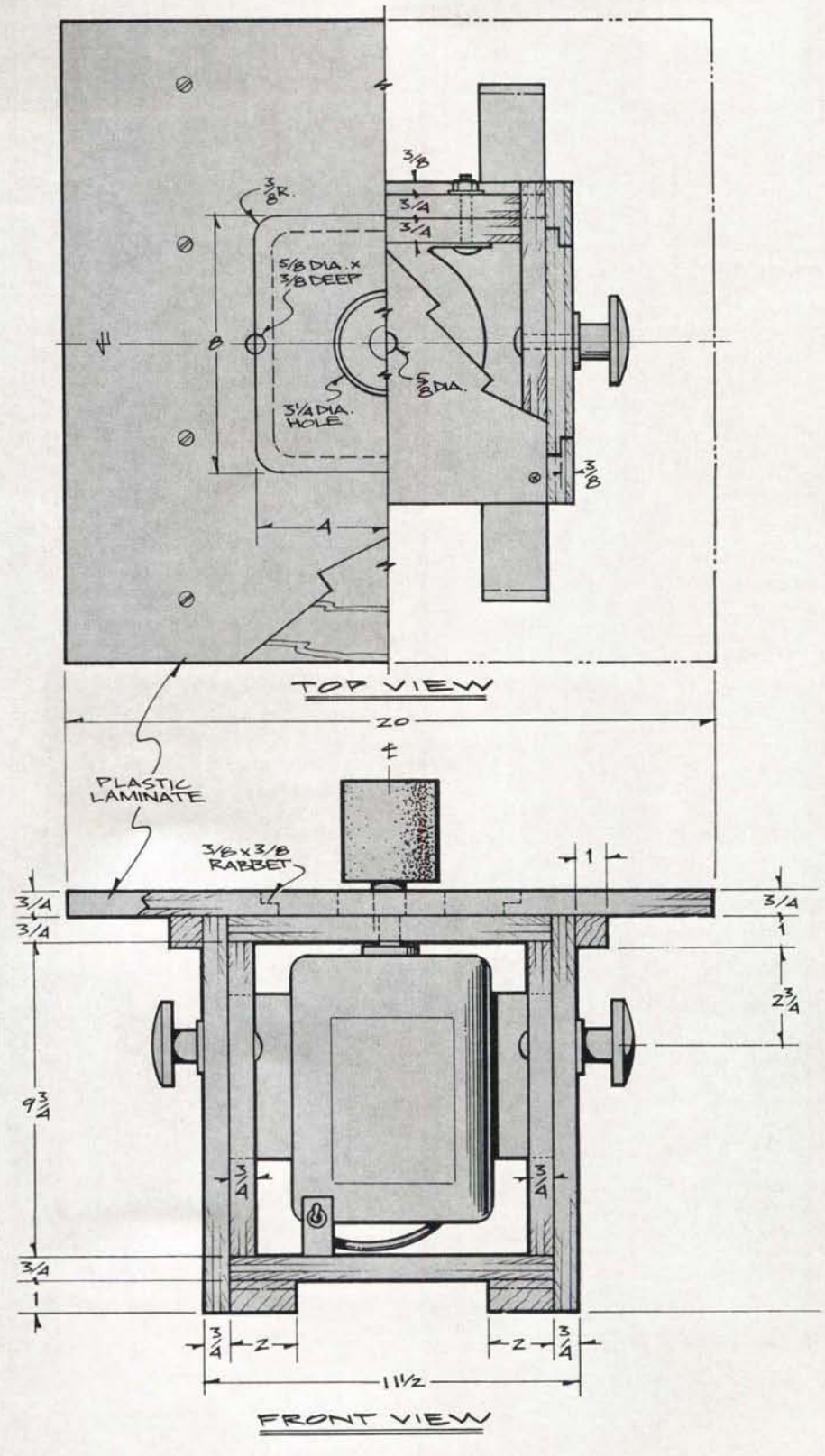
Part	Description	Size	No. Req'd.
	Adjustable Table		
A	Top	3/4 x 20 x 20*	1
B	Plastic Laminate	about 24 x 24	2
C	Insert	3/4 x 8 x 8*	1
D	Cleat	1 x 1 x 19	2
E	Side	3/4 x 7 x 12 1/4	2
	Base		
F	Top/Bottom	3/4 x 10 x 10	2
G	Side	3/4 x 9 3/4 x 10	2
H	Motor Support	3/4 x 5 x 10	1
I	Mounting Block	3/4 x 5 x 8 1/2	1
J	Way	3/4 x 2 x 12 1/4	4
K	Foot	1 x 2 x 16	2
	Hardware		
L	Knob	1 3/4 diam.**	2
M	Motor	1/2 horsepower, 5/8 shaft, 1725 RPM***	1
N	Switch	As shown, included w/ motor***	1
O	Switch Bracket	7/8 x 1 3/4 x 4 1/4	1
P	Arbor	3 1/2 long; Right hand 1/2-20 thread****	1
Q	Sanding Drum	3 in. long x 3 in. diam.****	1
R	Chuck	Right hand 1/2-20 thread****	1

* Top and insert dimensions do not include laminate.

** Knobs are available from United States Plastic Corp., 1390 Neubrecht Rd., Lima, OH 45801. Cost is $1.74 each for their part no. 83-85212.

*** Motor w/ switch available from Woodworker's Supply of New Mexico, 5604 Alameda Place NE, Albuquerque, NM 87113. Cost is $79 for their part no. 803-113.

**** Arbor, sanding drum and chuck available from Craftsman Wood Service Company, 1735 W. Cortland Ct., Addison, IL 60101. Costs are $4.69 for the arbor (part no. H0714), $14.95 for the sanding drum (part no. H0763), and $5.45 for the chuck (part no. H0703). Craftsman also sells shaft-type drums.



corners of the insert to match the radius of the cutout. Finally, bore the 3 1/4 in. diameter center hole.

Another option, if you don't want to fuss with either the rabbeted cutout or the inserts, is to just bore a 3 1/4 in. diameter hole in the adjustable top, and then make several extra tops of 3/4 in. plywood, each with a hole bored in the center to match a particular drum size. These tops can then be clamped or screwed to the adjustable top as needed. Neither these tops nor the adjustable top need be covered with plastic laminate, although the addition of the laminate makes a smoother and more durable working surface.

If you've decided to apply the laminate (B), note that it's applied to both sides in addition to the edges. It's important to laminate both sides of the top to equalize stresses on the plywood substrate. The thumbhole is bored to a 3/8 in. depth with the insert in place. A gentle chamfer on the thumbhole side of the insert will facilitate lifting it out. We usually like to follow a laminating procedure where we first apply the laminate to the bottom, then the edges, and finally the top surface. Use a laminate trimmer bit to trim the laminate flush with the edges of the cutout and insert. The countersunk screw holes in the top are made after the laminate is applied.

Also cut the cleats and the sides (E). We used the router with a rabbeting bit to mill the 3/8 in. wide by 1/2 in. deep rabbets in the sides. The slots can be made by boring two holes, then cutting with a hand-held jigsaw to connect them.

With the adjustable table complete, next go to work on the base. It's just a box with a top and bottom (F), sides (G), and the motor support (H) and mounting block (I). The ways (J) and feet are applied after the box is assembled.

Our box is designed to fit the Delta motor (M) specified in the Bill of Materials. Note that the location of the motor support and mounting block situate the motor so that its shaft is dead-center on the table. If you use another motor, you'll need to locate the motor support and mounting block with respect to it. The way to do this is to first drill the hole in the box top. This hole is drilled to the size of the shaft, which was 5/8 in. diameter on our motor. Then block up the motor so the shaft is dead-center in the hole. Finally, cut the notches in the base sides for the motor support so the support and mounting block will hold the motor on-center in that position.

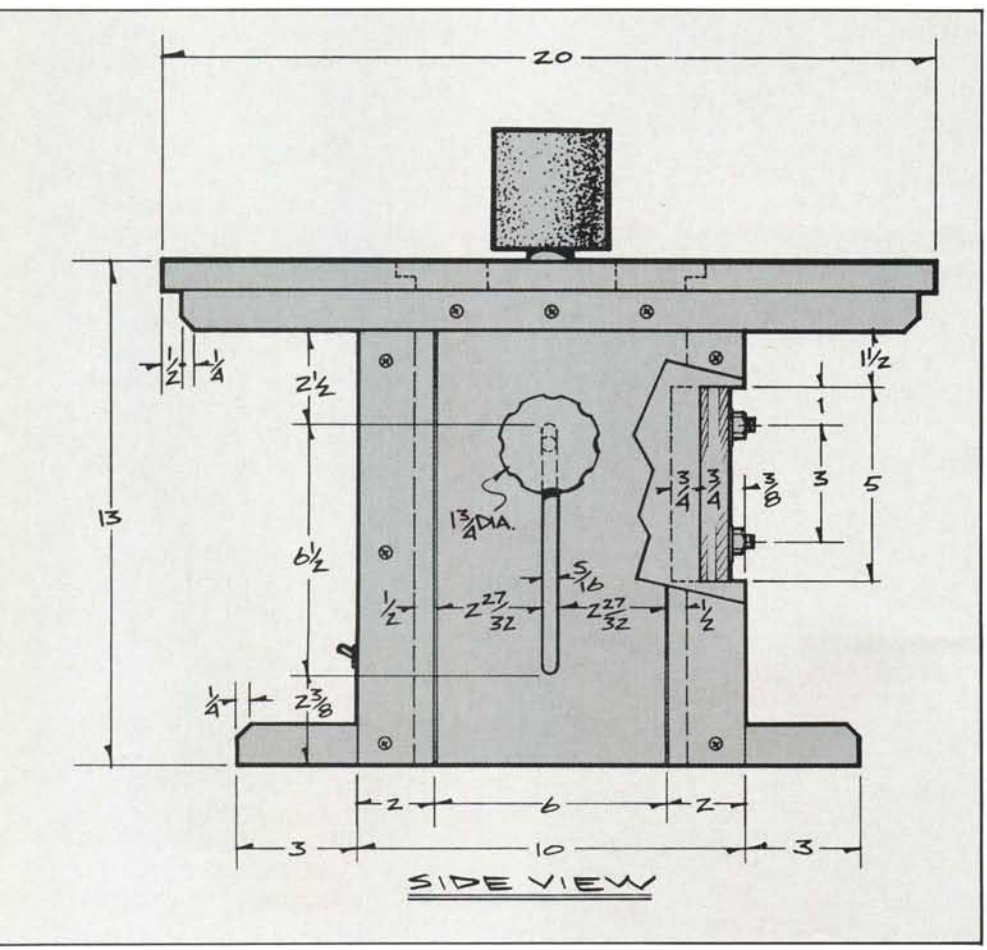
If you have an old motor, but no way of mounting it, a universal strap-type motor mount is available from American Machine & Tool Company, Fourth Avenue and Spring Street, Royersford, PA 19468. It's their part no. A440, which costs $6.75 plus shipping. If you have an old washing machine or dryer motor, these motors usually have a mounting flange with screw holes, so you can dispense with parts H and I altogether. Just screw the motor up into the base top. Use machine screws and threaded inserts for a strong connection.

If you opt for the Delta motor, it comes complete with the cord and switch (N). Toggle switches can be purchased at an electrical supply store, if you use an old motor. In either case, you'll need to make the switch bracket (O). Ours is a hardware store variety right-angle bracket, with one leg cut back and the holes drilled as shown. You may have to alter the bracket size and switch-hole location based on the switch you buy.

The ways have a 3/8 in. by 1/2 in. rabbet, matching that in the table sides. Mount the ways so that the table slides up and down easily without binding. A little paraffin wax on the ways will help prevent wear. Note that we applied a 1/8 in. chamfer to the bottom inside end of the adjustable table sides so that they don't catch on the base bottom or feet as the table is lowered. The plastic knob (L) secures the adjustable table at the desired level. Holes drilled through the box sides accept the carriage bolts onto which the knobs are screwed.

When mounting the arbor to the motor shaft, line up the setscrews in the arbor with either the keyway in, or the flat on, the shaft. If you try to tighten the setscrews directly onto the curved part of the shaft, they'll strip out.

Safety Note: The 3 in. diameter sanding drum we specify is rated as safe for use only below 2500 rpm. Do not use a higher rpm power source.



Wall-Hung Ironing Board

Here's a handy project that lends an everyday object a decorative flair. The board is large enough to be used as a household's primary ironing surface. Yet the unit is compact enough to serve as a spare in the kitchen or bedroom. Wherever you decide to put it, the ironing board will wait unobtrusively in its case until needed.

We made our case parts from 3/4 in. thick pine and the board itself from 3/4 in. thick birch plywood. The plywood helps prevent warping, but you can substitute pine if you want. The choice of finish is open to interpretation. We finished it with Minwax Jacobean stain followed by two coats of Minwax Antique Oil Finish. You can paint the unit to match your decor, or even leave it unfinished if you plan to hang it in the utility room. We list a source for the ironing board cover in the Bill of Materials.

The project is a straightforward case piece employing a rabbet and dado for the joinery. There is no full-length back; screws through cleats (parts E and F) at the top and bottom hold the unit securely to the wall. For more on hanging cabinets see Woodworking Basics on page 17.

First, cut the stock to the sizes shown in the Bill of Materials. You'll save lumber if you cut from larger to smaller parts in sequence.

Then cut the dadoes and grooves in the sides (A). Use a 3/8 in. diameter straight cutter in the router table, and set the bit 3/8 in. high. For all these groove cuts you use essentially the same setup. The grooves for the cleats are stopped. The dadoes run across the width of the sides as shown.

Use the same setup to cut all the 3/8 in. deep by 3/8 in. wide rabbets: on the ends of the top and bottom (B), on the support shelf (C), and on the top and bottom cleats. Also notch the support shelf as shown.

With the joinery done, move to the details. Cut the heart using the full-size pattern we provide, and establish the profile for the spacer block (G) and ironing board (H). Also make the thumb latch (N) as shown. The step in the latch makes it easier to operate. Note that the heart profile is slightly chamfered on the inside.

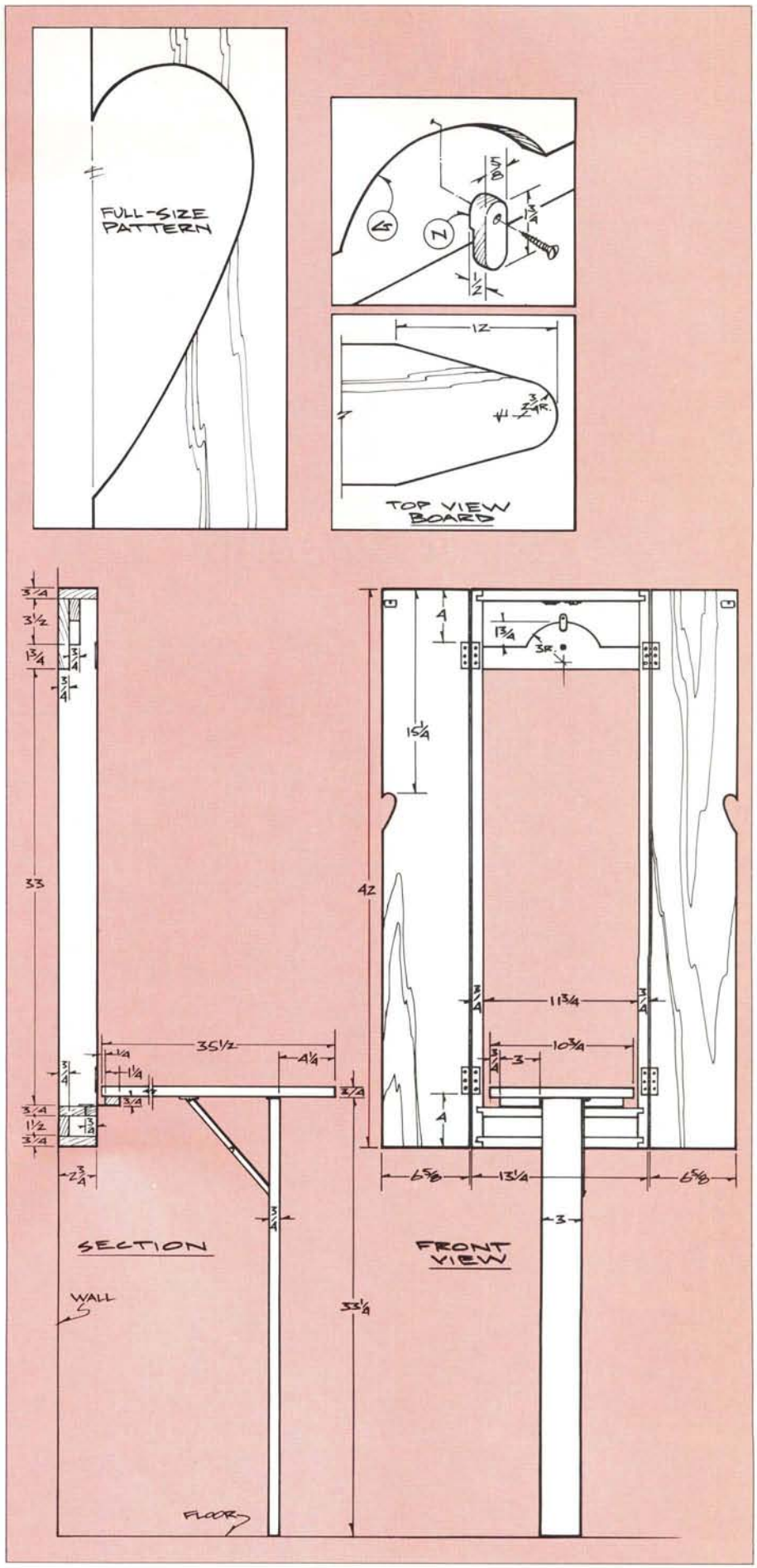
Now dry assemble the case to make sure everything is square and the parts fit. If everything fits as it should, sand

Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Side	3/4 x 2 3/4 x 42	2
B	Top/Bottom	3/4 x 2 3/4 x 12 1/2	2
C	Support Shelf	3/4 x 2 3/4 x 12 1/2	1
D	Door	3/4 x 6 5/8 x 42	2
E	Upper Cleat	3/4 x 5 1/4 x 12 1/2	1
F	Lower Cleat	3/4 x 1 1/2 x 12 1/2	1
G	Spacer Block	3/4 x 3 1/2 x 11 3/4	1
H	Board	3/4 x 10 3/4 x 35 1/2	1
I	Leg	3/4 x 3 x 33 1/4	1
J	Filler Block	3/4 x 1 1/4 x 3	2
K	Butt Hinge	1 3/8 x 2*	4
L	Table Hinge	1 3/8 x 3 1/8*	3
M	Lid Support	10 in. as shown*	1
N	Thumb Latch	1/2 x 5/8 x 1 3/4	1
O	Magnetic Catch	as shown*	2
P	Cover	as shown**	1

* Available at hardware stores.

** A cover to fit the board is available from Meisel Hardware Specialties, P.O. Box 70, Mound, MN 55364. Order part no. 8947, which costs $14.45 postage paid.



the parts and assemble the case. Note that the spacer block is glued in place, but it's best to leave it off until the rest of the case is out of clamps.

With the case done, mortise for the butt hinges and hang the doors. Also install the filler blocks (J) and the three table hinges (L). Note that you should position the board inside the completed case to find the precise hinge locations, and that the hinges are oriented for maximum strength. For the bottom of the board, the short side of the hinge is screwed to the support shelf, and the long side of the hinge is screwed to the filler blocks, which are screwed to the bottom of the board. (A space between the filler blocks and the edge of the board allows you to wrap the cover around the board.) At the top of the board, the short leaf is screwed to the underside of the board. With the board attached, add the lid support (M), the magnetic catches (O), the leg (I) and the thumb latch.

As noted, you can finish the piece as you choose using a clear coating or paint. It's best to leave the board itself unfinished, so the heat of the iron doesn't affect varnish or paint. The cover (P) goes on last.

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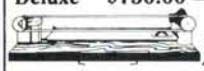

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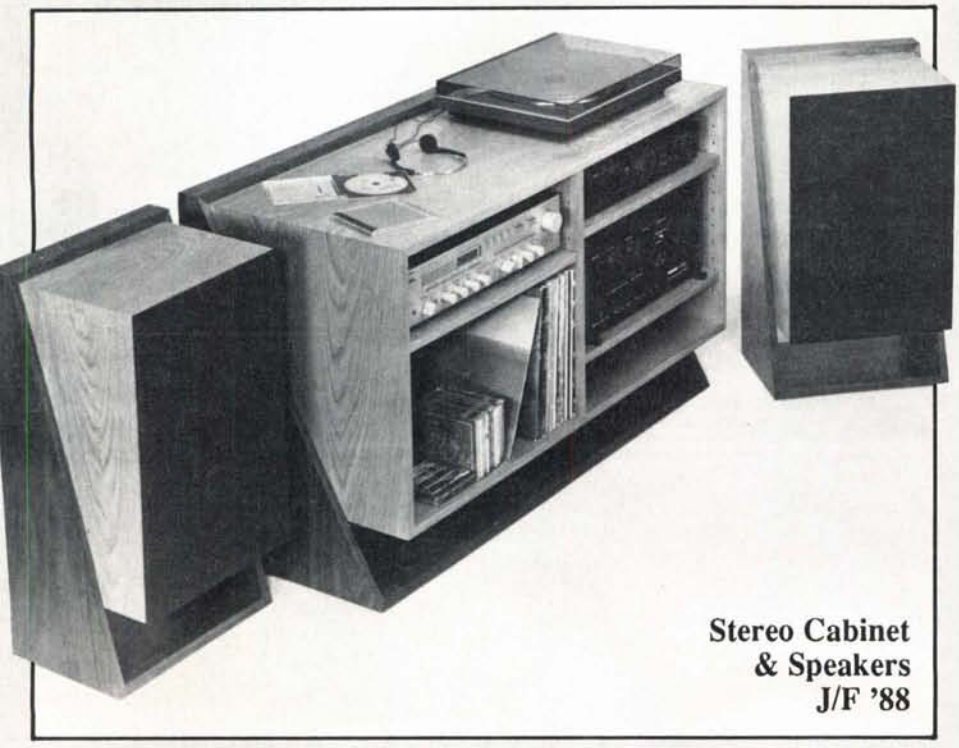

Stereo Cabinet & Speakers J/F '88

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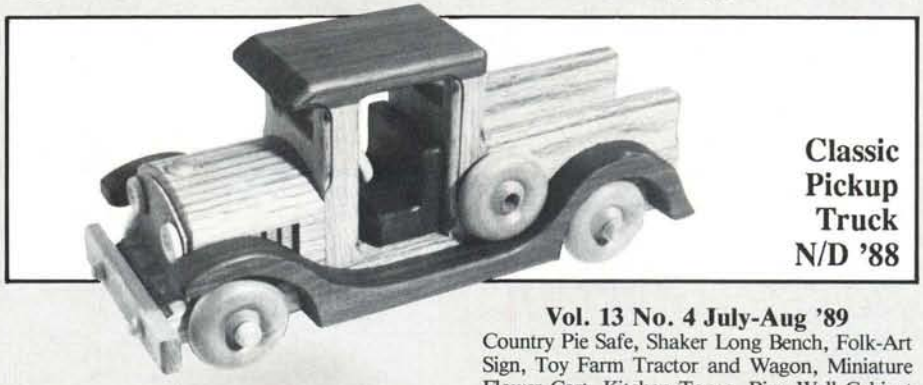

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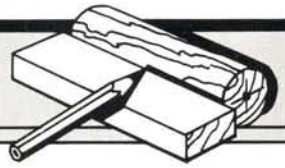


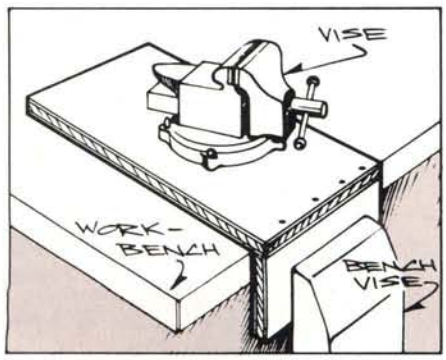
Shop Tips

Over the years I've had many hobbies, none of which held my interest very long, until I began woodworking several years ago. Each hobby left behind various kinds of equipment, stored away because "it might come in handy some day." One of those items was a folding aluminum music stand, intended to hold sheet music while I learned to play the guitar. I'm glad I took those guitar lessons, because that stand has become like an extra pair of hands in my shop. I place it near my work and use it to hold a copy of *The Woodworker's Journal* open to the plans I'm working on. It's adjustable for easy reading whether I'm sitting or standing, takes up no space on my bench, and keeps my copy of *The Woodworker's Journal* out of harm's way. It even folds for easy storage when I'm not using it.

If your readers don't happen to have one of these things in a closet somewhere, it can be purchased at a very reasonable price in most music stores. I never mastered the guitar but, with the help of the music stand, *The Woodworker's Journal* and I make beautiful music together.

Gary D. Wargo, Fostoria, Mich.

It's no vice to have two vises, but my woodworking shop didn't have a good place to put a metal working vise — even though I could have put one to good use on occasion. I managed to solve the problem by bolting a metal working vise to an "L" shaped bracket



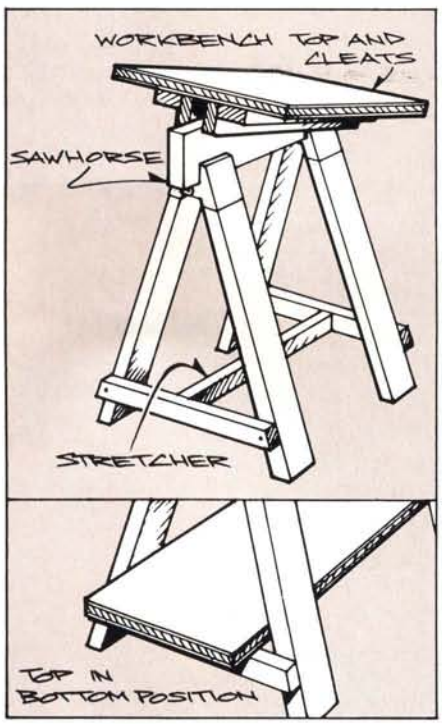
made from 3/4 in. thick plywood. Now, when my woodworking projects require some metal work, I simply clamp the short leg of the bracket into the vise and it's ready to use. When not in use, it can be easily stored out of the way.

Collise Brown, Waterville, Vt.

We cut corrugated box cardboard into small squares and use them as blade guards for X-Acto, chip carving, and utility knives. The blade is pushed into

the edge of the cardboard. Not only does the cardboard protect the blade, it also helps protect your fingers when reaching for the knife.

Here's an easy way to convert a sawhorse into a small portable workbench. The workbench top is simply a piece of 3/4 in. thick plywood with cleats on the underside that permit it to slip over the 2 by 4 sawhorse top. The cleats are spaced to provide a snug fit. When



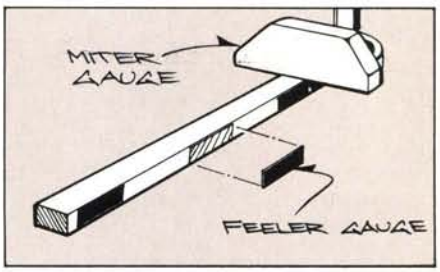
not being used as a workbench, the top fits over the 2 by 2 bottom stretcher to become a handy shelf. I've found it useful not only in the shop, but also when I need to do some outdoor handywork.

Carl W. Hull, Overland Park, Kan.

We all have spilled a coffee can filled to the brim with nails (or worse yet, small brads). We can't cry over spilled milk, but a million little nails all over the shop floor is just cause for at least a few tears. However, when it happens to me, I use a little trick that makes the pickup a lot quicker. I have a large magnet which I wrap with a piece of cloth (about one foot square), then I use the covered magnet to pick up the nails. Once they are all collected, I fold the corners of the cloth around the nails and remove them from the magnet. It's then an easy matter to put them all back in the coffee can.

Doug Parker, Appling, Ga.

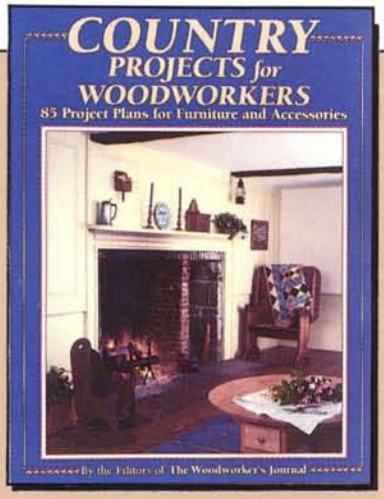
My table saw had a very sloppy fit between the bar of the miter gauge and the miter gauge slot. I was able to solve the problem using an automotive feeler gauge. First, I selected a gauge that provided the right fit (the .007 in. thick gauge was perfect), then I cut it into three pieces and slightly beveled the edges using a sharpening stone. (The



bevels help keep the feeler gauge pieces from catching when the bar is inserted into the slot). Next, the pieces were glued to the edge of the bar with epoxy, then clamped firmly. When dry, I lightly sanded the gauges with fine sandpaper to remove any burrs or excess glue.

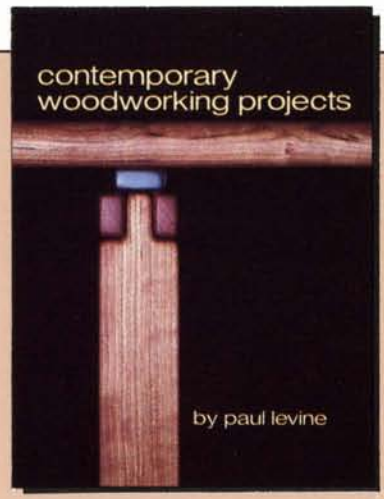
Gary Peterson, Rochester, Wash.

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



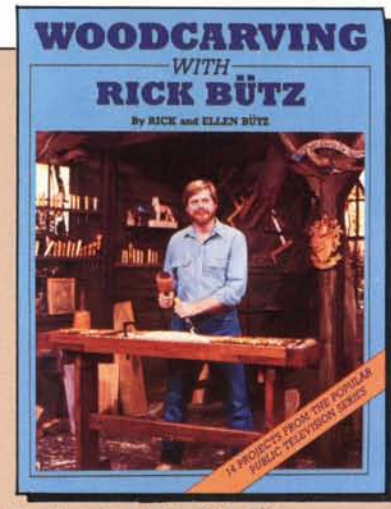
Country Projects For Woodworkers

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



Contemporary Woodworking Projects

Paul Levine guides woodworkers of all skill levels through room-by-room chapters of coordinated furniture and accessories. The clean angles, sturdy joinery and special techniques are made easy to master with step-by-step instructions and illustrations. Among the 40 handsome projects are a matching Love Seat, Chair and Ottoman set, an Oak Credenza, a Platform Bed, and a Japanese Shoji Lamp. Children will enjoy their own table and chair set, puzzles and a great box of dominoes.



Woodcarving With Rick Bütz

Learn woodcarving! With just a few tools and a few hours to spare, you can share in the simple pleasures of carving. Wander into the Black Forest of Germany with a traditional carving of St. Nick, or into a small Russian village with a Dancing Bears folk toy. You'll 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 also chapters on tool selection, sharpening, whittling, chip and relief carving.

BOOKS *FROM* The Woodworker's Journal

You'll find the order form for these books bound in the center of this issue.

Projects For Woodworkers, Volume 1

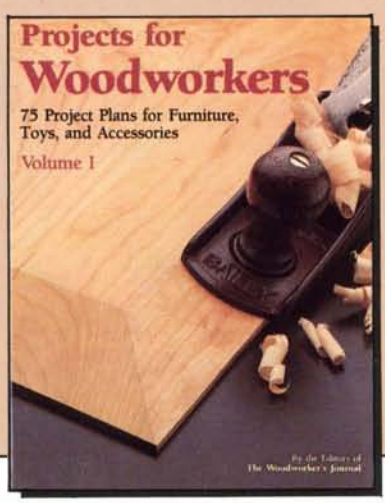
Beginning and advanced woodworkers alike will appreciate the full range of styles in furniture, accessories, lamps, clocks, toys and gifts. Of the 75 projects selected from the 1980-81 issues of *The Woodworker's Journal,* plans include a Cabinetmaker's Workbench, Pine Shaker Cupboard, Old-time Icebox,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

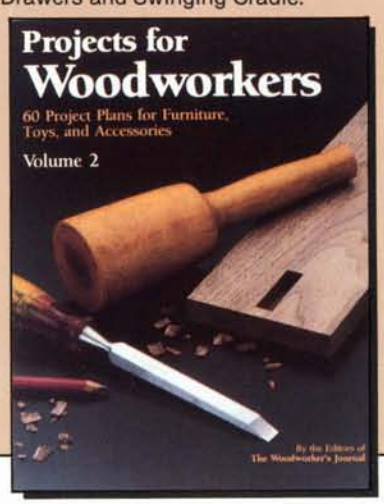
Projects For Woodworkers, Volume 2

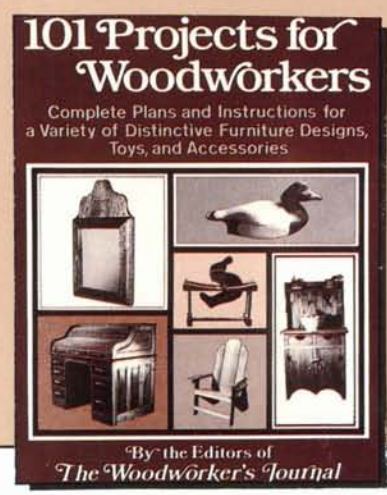
Originally published in the 1982 issues of *The Woodworker's Journal,* all 60 projects were chosen with a wide variety of styles and skill levels in mind. Each project is presented with complete instructions and thorough illustrations. You'll find household accessories like the Desk Caddy, Casserole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

101 Projects For Woodworkers

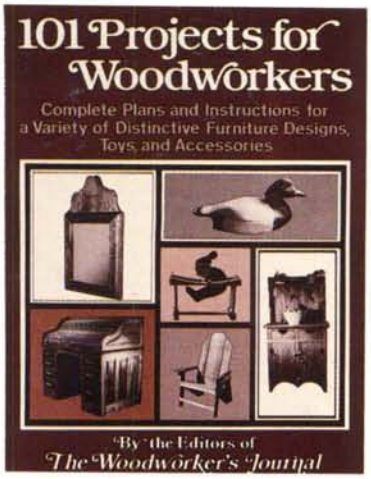
For the eager amateur just starting out or the craftsman with a shop full of tools, **101 Projects For Woodworkers** features an unparalleled variety of classic projects for everyone. Included in this collection of plans from the 1977-80 issues of *The Woodworker's Journal* are a classic Rolltop Desk, an old-fashioned Porch Swing, traditional and contemporary furniture, clocks, mirrors, home accessories, toys and novelties. Complete instructions and illustrations.







Great Projects . . . *Great Classic Projects*



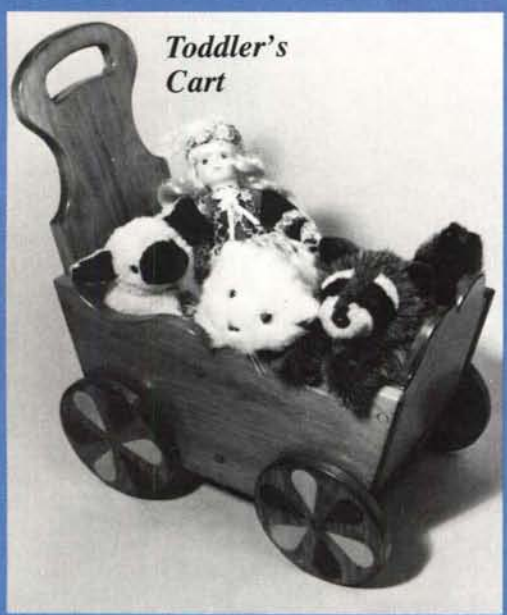
Swan Rocker

Swedish Door Harp

Early American Cupboard

101 Projects for Woodworkers, now in its 6th printing, is still a favorite source of projects, plans and ideas for all woodworkers. From classic and antique reproductions to garden furniture, home accessories and great wooden toys, **101 Projects for Woodworkers** is a must for the home workshop.

You'll find more information on this and other books from ***The Woodworker's Journal*** on page 59. To order use the handy order form bound in the center of this issue.



Toddler's Cart

Candle Holder

Next Issue . . .

We've got lots more great projects. Here's just a few.

The Folk Fiddle project offers our readers a sampling of the fine art of Luthiery. Our clear instructions and illustrations enable woodworkers of modest skill to make this marvelous instrument. And when you're done with that, you can take a breather with two simpler projects. The Toddler's Cart will help the little folk with their first steps. The Candle Holder will turn a bit of your scrap into an attractive addition to your dining table.

Folk Fiddle