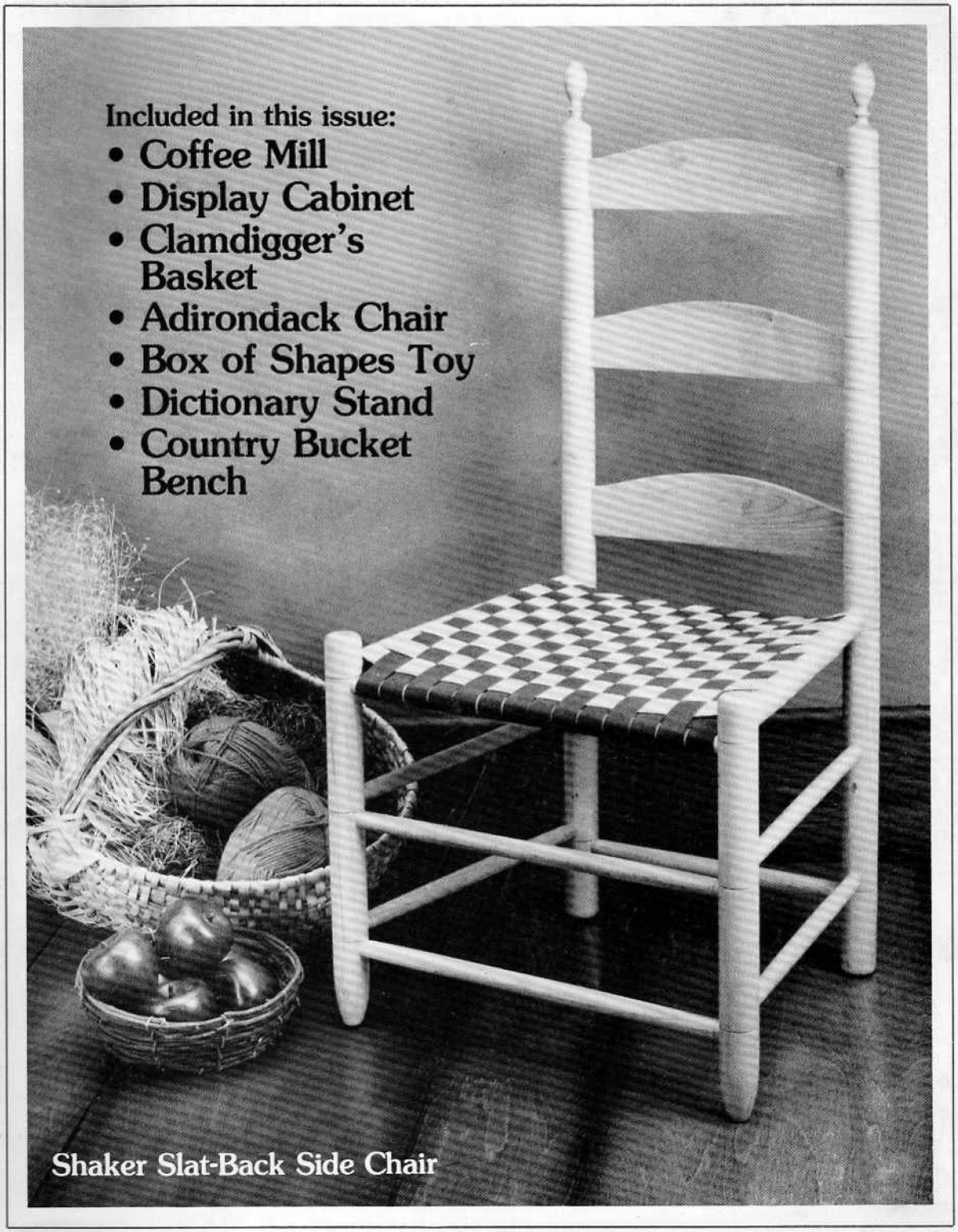
July/August 86

The Woodworker's Journal

Vol. 10, No. 4 $3.00



July/August 1986

TREND-LINES BEATS ANY AD THIS ISSUE!

MAKITA TOOLS

1100	3 1/4" Planer Kit	$ 169.95
1805B	6 1/8" Planer Kit	277.95
1900BW	3 1/4" Planer w/case	99.95
2030N	12 1/2" Plnr/Jntr	1445.00
2040	15 5/8" Planer	1235.00
2708W	Table Saw W/Carbide Blade	221.95
3601B	Router	119.95
3612BR	3 HP Router	185.95
4200N	4 3/8" Circular Saw	96.95
4300DW	Cordless Jig Saw	108.95
4301BV	Vr. Sp. Orbital Jig Saw	124.95
5007NB	7 1/4" Circular Saw	99.95
5008NB	8 1/4" Circ. Saw	109.95
5081DW	3 3/8" Cordless Saw	109.95
5402A	16" Circular Saw	314.95
6000R	Uni-Drill	99.95
6010DL	Cordless Drill w/charger light & case	99.95
6010DWK	Cordless Drill w/charger & case	88.95
6010SDW	3/8" Rev. Cordless Drill	49.95
6012HDW	Cordless Drill Kit 2 Sp.	108.95
6510LVR	3/8" Drill—Rev.	84.95
6710DW	Cordless Screwdrver	104.95
6800DBV	Drywall Screwdriver	89.95
9045B	Finishing Sander	99.95
9045N	Dustless Sander	99.95
9207SPB	7" Sander Polisher	139.95
9401	4" x 24" Belt Sndr	162.95
98202	Blade Sharpener	169.95
9900B	3" x 21" Belt Sndr	122.95
9924DB	3" x 24" Belt Sndr	134.95
BO4510	Finishing Sander	49.95
DA3000DW	Cordless Angle Drill	102.45
DA3000R	3/8" VSR Angle Drill	99.95
DP3720	3/8" Reversible Drill	49.95
DP4700	Drill Reversible	99.95
GV5000	Disc Sander	56.95
JR3000V	Recipro Saw	124.95
JV2000	Orbtl. Var. Jig Saw	104.50
LS1000	10" Miter Saw w/vise	229.95

AEG TOOLS

BSPE60	Orbtl. Top Handle Jig Saw	$133.95
EH82S	3 1/4" Planer	129.95
EZ501	Cordless Screwdvr	39.95
EZ502	Cordless Driver w/adj. handle	54.95
EZ505	Cordless Drill/Driver	78.95
FSP60	Orbital Jig Saw	99.95
HBSE75S	3" x 21" Belt Sndr	129.95
PC70	7 1/4" Circular Saw	97.95
RSK600	Orb. Recip. Saw	146.95
SBE401RL	3/8" Hammer Drill	55.95
SCRIIE	Electronic Drywall Driver	77.95
VS130	1/3 Sheet Orbtl. Sander	48.95
VS260	1/2 Sheet Orbtl. Sander	88.95
VSS260	1/2 Sheet Orbtl Sander w/dustbag, rubber sanding plate	118.95

JORGENSEN BAR CLAMPS

(HEAVY DUTY)

		Each	Pkg. 6
No. 7224	24"	17.30	15.70 Ea.
No. 7230	30"	18.10	16.45 Ea.
No. 7236	36"	18.70	16.95 Ea.
No. 7248	48"	20.75	18.70 Ea.
No. 7260	60"	22.65	20.55 Ea.
No. 7272	72"	24.55	22.25 Ea.

JORGENSEN CLAMPS

(MED. DUTY)

No. 3712	12"	5.90	5.35 Ea.
No. 3724	24"	7.30	6.60 Ea.
No. 3730	30"	8.20	7.40 Ea.
No. 3736	36"	8.85	7.95 Ea.

JORGENSEN HAND SCREWS

No. 3/0	3"	8.45	7.60 Ea.
No. 0	4 1/2"	9.90	8.90 Ea.
No. 1	6"	11.30	10.15 Ea.
No. 2	8 1/2"	13.45	12.15 Ea.

JORGENSEN BAR CLAMPS

No. 4512	12"Open	17.45	15.70 Ea.
No. 4524	24"Open	20.85	18.85 Ea.
No. 4530	30"Open	21.90	19.65 Ea.
No. 4536	36"Open	22.90	20.60 Ea.

RYOBI TOOLS

AH115	12 1/2" Plnr-Jntr	$1275.00
AP125	12 1/2" Planer	995.00
AP10	10" Planer w/spare blade set	399.95
AP10JS	10" Planer w/spare blade set & Jigsaw	484.95
B7075	3" x 21" Belt Sndr	$117.95
BS360NR	Hvy Duty Band Saw	1195.00
BS50N	9 1/4" Band Saw	695.00
JSE-60	Electronic Jigsaw	124.95
L-580	6 1/8" Planer	253.95
R-330	2 HP Router	139.95
R-500	3 HP Plunge Router	162.45
R2500	10" Radial Arm Saw	445.00
RA2500SP	Radial Arm Saw/Kit	525.00
TS-251UB	10" Miter Saw w/ Freud LU85M10 Blade	229.00

MILWAUKEE TOOLS

0228-1	3/8" VSR Drill	$ 93.95
0234-1	1/2" VSR Drill	113.95
0375-1	3/8" Rev. Angle Drill	117.95
1107-1	1/2" VSR D Handle	144.95
5660	1 1/2 HP Router	189.95
5680	2 HP Router	219.75
5935	4" x 24" Belt Sndr	214.90
6014	1/2 Sheet Sander	124.95
6255	Vr. Sp. Jigsaw	139.95
6287	H.D. Jigsaw	224.50
6305	6 1/4" Cordless Saw	134.95
6367	7 1/4" Circ. Saw	129.95
6507	Sawzall w/case	139.95
6539-1	Cordless Screwdriver	61.95
6543-1	1/4" Screwdriver	155.50
6749-1	Magnum Screwdriver	139.95
8975	Heat Gun w/scrapers	89.95

DELTA (ROCKWELL) POWER TOOLS

11-072	32" Radial Drill	$ 444.95
22-651	13" Planer	999.00
28-243	14" Band Saw	563.90
28-283	3/4 HP Bandsaw	745.00
31-730C	Belt and Disc Sander	1281.00
33-150	Sawbuck	529.00
33-990	10" Radial Arm Saw	474.50
34-410	10" Contractors Saw	699.00*
34-761	Unisaw	1450.00
37-220C	6" Jointer	1250.00
37-255	6" Jointer	495.00
37-315C	8" Long-Bed Jointer	1495.00
40-601	Electronic Scroll Saw	895.00
43-122	Wood Shaper	528.95
46-140	11" Lathe	433.95
46-541S	12" Lathe	1399.00

*Less $100 Rebate.

PORTER CABLE

100	7/8 HP Router	$ 97.95
303	6" Disc Sander	153.95
309	Laminate Trimmer	90.95
314	4 1/2" Trim Saw	124.95
320	Abrasive Planer	90.95
330	Palm Finish Sander	61.95
337	3" x 21" Belt Sander w/bag	133.95
360	3" x 24" Belt Sander w/bag	196.95
362	4" x 24" Belt Sander w/bag	206.95
505	Finishing Sander	122.95
518	3 HP Electronic Router	343.95
587	7 1/4" Circular Saw	139.95
690	1 1/2 HP Router	135.95
695	1 1/2 HP Router/ Shaper	194.95
696	Router/Shaper Table only	104.95
3151	7 1/4" Circular Saw	116.95
7548	Orb. Jig Saw	139.95
7648	Orb. Jig Saw w/barrel grip	139.95
9627	2 Sp. Tiger Saw Kit	135.95

PONY CLAMP FIXTURES

	Each	Pkg 6
No. 50 3/4" Pipe Clamp	7.30	6.55 Ea.
No. 52 1/2" Pipe Clamp	6.05	5.60 Ea.
No. 1215 (WEB) 15"	6.80	6.35 Ea.
No. 7456 Clamp Pads	2.95	2.50 Ea.

JORGENSEN & PONY CLAMPS

No. 3325 3 Way Edging	5.75	5.10 Ea.
No. 1623 3" Hold Down	7.50	6.30 Ea.
No. 3202HT 2" Spring	2.15	1.90 Ea.

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TFWC104	4 Pc. Chisel Sets	$19.95
TFWC106	6 Pc. Chisel Sets	31.75
TFWC110	10 Pc. Chisel Sets	52.95
TFTT108	8 Pc. Lathe Set	53.95
TFCS106	6 Pc. Carving Set	59.50
TFCS112	12 Pc. Carving Set	111.50

BLACK AND DECKER INDUSTRIAL TOOLS

1179	3/8" Var. Sp. Drill	$ 69.95
1575	3/8" VSR Scrudrill®	99.95
1703	10" Miter Saw	199.95
3051	7 1/4" Wormdriver Saw	139.95
3103	2 sp. Cut Saw kit	99.95
3105	Var. Sp. Cut Saw kit	109.95
3107	Var. Sp. Orbital Cut	129.25
3265	Laminate Trimmer	145.65
3310	1 1/2 HP Router	129.95
3370-10	3 1/4" Planer	99.95
4010	Palm Sander	49.95
4247	4 1/2" Disc Sander/ Grinder	69.95
6750	Heat Gun	59.95
9425	Compound Miter Saw	119.95

HITACHI TOOLS

CB75F	14 1/2" Band Saw	$1517.80
CJ65VA	Electronic Jigsaw	157.95
CR10V	Reciprocating Saw	123.95
C6DA	6 1/4" Circular Saw	134.95
C12Y	12" Table Saw	1307.25
DRC-10	Cordless Screwdriver	94.45
F1000A	Planer/Jointer	1338.75
F20A	3 1/4" Planer	102.85
P50	6 5/8" Planer	283.45
P100F	12" Planer	1013.25
SB-75	3" x 21" Belt Sander 2 sp. w/dust bag	134.95
SB8T	3" x 24" Belt Sander 2 sp. w/dust bag	173.25
TR-6	Laminate Trimmer	93.95
TR-8	1 HP Plunge Router	133.30
TR-12	3 HP Plunge Router	175.95

SUNGOLD X-WEIGHT SANDING BELTS

Sold in packs of 10 only. Outlasts regular belts 2 to 1.

Size	Grit	1 pk. same size & grit	5 pks. same size & grit
3" x 21"	120	$9.80 pk.	8.40 pk.
	100	9.80 pk.	8.40 pk.
	80	10.00 pk.	8.60 pk.
Assortment	60	10.50 pk.	9.20 pk.
of 10 $12.95	50	10.70 pk.	9.40 pk.
	40	11.00 pk.	9.60 pk.
3" x 24"	120	12.00 pk.	9.30 pk.
	100	12.00 pk.	9.30 pk.
	80	12.20 pk.	9.70 pk.
Assortment	60	12.60 pk.	11.20 pk.
of 10 $13.95	50	13.10 pk.	11.50 pk.
	40	13.40 pk.	11.80 pk.
4" x 24"	120	16.80 pk.	14.60 pk.
	100	16.80 pk.	14.60 pk.
	80	17.30 pk.	15.10 pk.
Assortment	60	17.80 pk.	16.40 pk.
of 10 $18.95	50	18.50 pk.	17.00 pk.
	40	18.90 pk.	17.60 pk.

SUN GOLD SANDING SHEETS

9 x 11 Aluminum Oxide C Weight

Grit	Pk of 100
150, 120, 100	$21.95
80	23.70
60	28.90
50	32.05
40	38.30

9 x 11 Non-Loading Silicon Carbide A WEIGHT

Grit	Pk of 100
400, 360, 320, 280, 240, 220, 180	
150, 120	$19.60

FREUD SAW BLADES 10"=5/8" Bore Carbide Tipped 12"=1" Bore.

No.	Size	Teeth	Use	Price
LU72M10	10"	40	General	$33.95
LU73M10	10"	60	Cut-Off	29.95
LU73M12	12"	72	Cut-Off	76.90
LU78M10	10"	80	Plastic	83.50
LU82M10	10"	60	Cut-Off	39.95
LU82M12	12"	72	Cut-Off	85.95
LU84M11	10"	50	Comb.	36.95
LU85M10	10"	80	Cut-Off	59.95
LM72M10	10"	24	Ripping	33.95
DS306	6"	Dado		89.95
DS308	8"	Dado		99.95

If a prepaid price for an identical product in our ad is lower, we match the price and give you a gift certificate worth $5.00 when purchasing from our catalog. Few restrictions apply.

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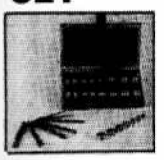
- 7 pc. brad point woodbit set in protective pouch.
- 7 pc. adjusting collars for woodbit set.



YYFB21W **$49.95**

SUPER SAVINGS ON ALL FREUD BLADES

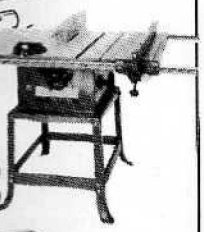
BUY THIS MAKITA CORDLESS DRILL AND GET A FREE VACUUM CLEANER

Drill works in forward or reverse. Battery, charger, key and Phillips bit incl.

MKDK1001
$89.95

DELTA CONTRACTORS SAW

$100 REBATE BY MAIL!



RW34410SP **$699.00**
With Rebate ***$599.00***

MAKITA BLADE SHARPENER

Handles long planer blades.

MK98202
$169.95

The Woodworker's Journal

JULY/AUGUST 1986 VOLUME 10, NUMBER 4

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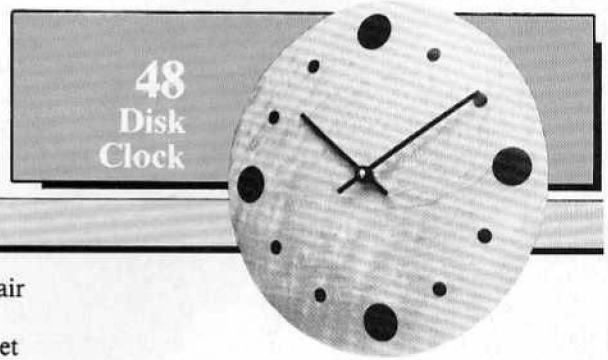
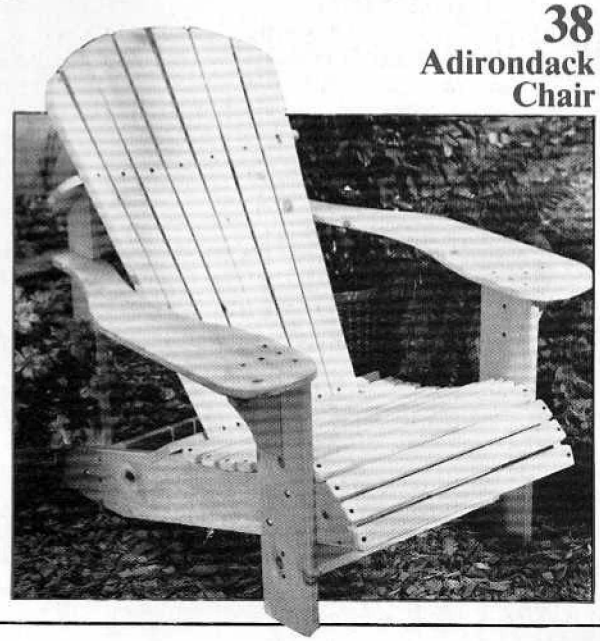
DEPARTMENTS



PROJECTS

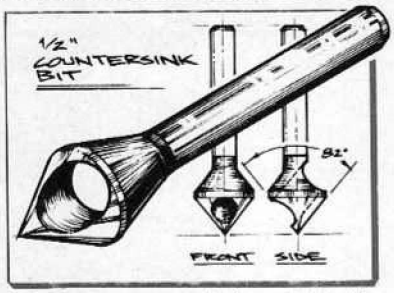


Shoptalk

Little Things Mean a Lot

Careful attention to small details imparts to our work that distinctive crispness of execution that is the hallmark of an outstanding craftsman. It also helps to have the right tools and to know how to use them effectively.

Recently Phil Bacon, our designer/craftsman, brought to my attention a rather different and sleek-looking countersink bit he's been using and which he feels is quite superior to the common hardware store countersinks that most of us have been using. These bits often produce rough and irregular recesses, particularly in softwoods and open-grain hardwoods. Now, I've got to confess that I never gave much thought to the operation of countersinking, but Phil is a far better craftsman than I and his work reflects his meticulous approach.



As you can see from the drawing, the business end of the bit is a cone with an 82-degree angle. A single hole cut at an angle through the cone creates the cutting surface.

These bits are made by Swiss Precision Instruments, Inc. and the Weldon Company, and are sold through machine shop supply distributors (check the Yellow Pages under Industrial Equipment and Supplies). Although designed for metalworking, they are great for woodworking. They don't chatter and they work equally well with the hand drill, electric drill or drill press. Phil uses the size which countersinks diameters from $\frac{3}{16}$ in. to $\frac{17}{32}$ in. and this lists in the S.P.I. catalog for $6.30. Admittedly, this is a little steep for a tool most of us hardly think about, but I thought I'd pass this information along for those of you who believe that little things can indeed mean a lot.

A Bit of a Bind

"What gives? Just when I order binders for my back issues, you go and change the size of your magazine. Now, the binders I've got are fine for all my issues up to and including Jan/Feb '86, but a little too roomy for the new issues. If you're sticking with the new size, aren't you going to change the binders and slip cases, too?"

The above is fairly typical of the letters we're receiving and the answer is — Yes! Beginning in January 1987 a standard binder and case size will reflect our new format (of course, the larger size will still be available by request for your back issue collections). Most of our readers organize issues by calendar year so we are keeping the binders and cases large enough to accommodate this January's issue, as well as all back issues, guessing that you'd rather place a smaller issue in a large binder than try it the other way around!

If you haven't yet ordered any, and your back issues are starting to get shop-worn, three binders or cases will handle all issues from Sep/Oct '80 through Nov/Dec '86. Then, in 1987 you can start ordering the smaller size. *Jim McQuillan*

MOLD, PLANE & EDGE

...in Your Shop or On the Job!

Attention: Renovators, Hobbyists & Carpentry Professionals: Now you can save up to $145.00 on *any* new W-7 Series Molder/Planer System from Williams & Hussey – just by sending for our FREE information kit!

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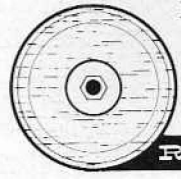

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Letters

In a recent Shoptalk column (March/April 1986), Jim McQuillan talked about the need for caution when using potentially hazardous finishing products. A friend of mine knows the hazards full well. He was using a cleaning solvent and, in the course of his work, managed to get some on his hands and clothes. Before cleaning up he needed to use his electric drill, but when he pulled the trigger the solvent vapors ignited, apparently caused by a spark in the electric motor of the drill. He ended up in the burn unit of our hospital. He's okay and very lucky to be alive.

Any spark or open flame can cause an explosion of flammable vapors. Stoves, heaters, cigarettes, pilot lights, and electric motors (your furnace has one) are a few of the potential culprits. To be safe, do all your finishing outside where vapors can't build up.

Gene Wager, Valley Falls, N.Y.

In your clock project articles, you rarely mention any company except Mason and Sullivan. There are other companies with good reputations that furnish fine clock movements. Two of them are S. LaRose, Inc., 234 Commerce Place, Greensboro, NC 27420 (catalog $2.50) and Merritt's Antiques, Inc., R.D. 2, Douglassville, PA 19518 (catalog $1.50).

John Mullen, Berne, N.Y.

I want to compliment you on the fine story and plans you provided for the Early American Tall Clock featured in your November/December 1985 issue. I built it as a Christmas gift for my daughter and it turned out beautifully. Rather than purchase the dial face, I had a friend paint a dial in the color my daughter likes.

Joseph G. McIntyre, Jr.
New Canaan, Conn.

We have just purchased a 1917 Stuze fire engine that we are starting to restore. It has wooden wheels which seem to be solid oak. The wheels are in great shape, but they have dried out over the years and have not been treated with any preservative, sealant or paint. We would like to get them back into top condition for the longest possible life. Can you help?

Butler Park Fire Co.
Washington, N.J.

Editor's Note: John Olson, who writes our Restoring Antiques column, will handle this one.

I would suggest that the first order of business would be to disassemble the wheels and give all parts a good cleaning. Remove the old finish, if any, from both wood and metal parts.

If the wood spokes are loose, they will need to be tightened. I once had a 1923 Model T Ford with wooden spoked wheels and the air in west Texas was exceedingly dry. The spokes would get so loose that they squeaked when turning corners. The cure was to remove the wheels and soak them overnight in a washtub full of water. Since this isn't always a permanent cure, something else might work such as Chair-loc brand compound. This liquid synthetic is applied in very small holes in the ends of the spokes. It polymerizes, so strength is not affected and it also causes the wood to swell.

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Another approach would be to set the spokes in clear epoxy when the wheels are reassembled. This would make a strong permanent job.

As for finishing, I would suggest a good marine finish such as Deks Olje or a good two-part marine epoxy finish. These finishes are available in most any good marine supply store. Above all, follow the manufacturer's instructions. Deks Olje recommends five coats of No. 1 and three coats of No. 2. This makes a fine durable finish. The mahogany panels on my boat attest to this. Three years outdoors and they still look good.

I built the Early American Tall Clock that was in your November/December 1985 issue and, like Mr. Rosenbloom (Letters, March/April 1986 issue), I thought that a battery-operated quartz movement, as was called for in the article, was kind of cheap for such an impressive piece. Instead, I substituted a triple chime, weight driven movement from the Mason and Sullivan Company.

I built the clock of cherry wood and everything worked fine until I started to install the movement. I found that for the movement to work, the face must be set back at least ¾ in. It would be even better to set it back a full inch as the weights barely clear the front of the case with the ¾ in. setback.

Also, if you use ½ in. plywood for the dial board you'll have to rout out space for the movement. The movement handshaft is only long enough to go through ¼ in. plus the thickness of the dial face. Then, after I got everything together, it didn't look right because the dial was about 1 in. back from the glass. I framed the dial with ¾ in. stock and found that it looked much better.

If anyone is planning to substitute a weight driven movement, I would suggest first building a temporary mock-up. This would allow you to locate the movement, take measurements, and then build the clock to fit. I didn't, and would have had less trouble if I did.

John Diekhans, Billings, Mont.

After reading the article "An Interview with Clare Maginley" (Workshop Income, May/June 1986), I sent an order to E.P. Dutton, Inc. at the address you listed, for a copy of Mr. Maginley's book of toy plans, *Trains and Boats and Planes and . . .* Dutton informed me that the book is out of print and returned my check. I'd like to obtain a copy of the book and would appreciate it if you could help.

Edward A. Kacicek, Asheville, N.C.

A call to Dutton confirmed that the book is still in print. However, rather than sending orders to Dutton's New York City address, they should be mailed to: New American Library, 120 Woodbine St., Bergenfield, NJ 07621. To avoid confusion, they recommend including the code number ISBN 0-8015-8814-6.

We incorrectly listed the price of the book as $7.95 for softcover, $12.95 for hardcover. It is only available in softcover, and the price is $12.95 plus $1.50 postage and handling charge. The book can also be ordered by any bookstore.

At Christmas my son-in-law gave me a ⅜ in. variable speed reversible (VSR) drill from Sears. In February I put it to

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use installing telephone jacks throughout the house. Things went swell for a while and I found the drill to my liking. However, nearing completion of the job it occasionally began to make a harsh sound. It got progressively worse until it sounded bad all the time.

I took the drill to the tool department at Sears and was told that nothing could be done without a sales slip. The customer service department said the same thing.

As luck would have it, a check with my son-in-law confirmed my worst fears — the sales slip had been tossed out. At Sears' suggestion I took the drill to their repair center but got the same story — no sales slip, no action. I could, however, get it fixed for $21.80 paid in advance.

In your March/April 1986 issue you had a comparative tool review article covering ⅜ in. variable speed reversible drills. In it you discuss the Sears guarantee and state ". . . Sears is widely recognized as having one of the best guarantees in the business. Considering this fact, and the ease with which repairs and returns can be accomplished, it is not surprising that Sears is so highly regarded". Based on my recent experience at Sears, though, I'm not so sure you're right.

Alvin Hammer, Chicago, Ill.

Editor's Note: We sent Mr. Hammer's letter along to Sears and asked for their comments. They reply:

While it is not absolutely necessary to retain a sales slip unless the item is commonly sold by other companies, it is a good practice to do so. A sales slip readily establishes the warranty period and thus facilitates an adjustment. We have a sign over the door on every Sears store across the country that reads "Satisfaction Guaranteed or Your Money Back". A customer advising Sears of dissatisfaction with the purchase of any product or service for any reason within a reasonable time after purchase will obtain prompt and courteous action from the Sears unit contacted. We stand by our services, our products and our people, but most importantly we stand by our customers.

Sears has assured us that they will contact Mr. Hammer and the Sears store involved, and will either replace the drill or issue a full refund. (Ed.)

Odds and Ends

The Mississippi Woodworker's Association holds meetings on the first Thursday of each month at the Sykes Park Recreation Center off Daniel Lake Drive in Jackson, Mississippi. Meetings begin at 7 p.m. and interested woodworkers are invited to attend. For more information, contact: Howard G. Boone, 105 Redbud Trail, Brandon, MS 39042.

The Kansas City Woodworker's Guild was started in November 1984. At this time we have 100 members, 33 percent professional and 66 percent amateur. Membership is open to anyone with an interest in woodworking. We meet on the second Wednesday of each month at 510 North Sterling in Sugar Creek, Missouri.

Our first annual public show was held this past November. Ninety-seven pieces of very fine work were displayed, with 750 people in attendance. For more information, call (816) 358-1227.

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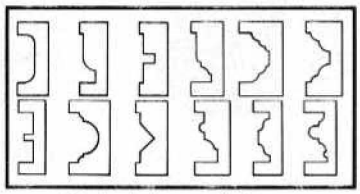

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Readers' Information Exchange

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

I need a source of supply for retractable casters (new or used) with threaded shafts. Sears sold them in the mid-1970's for use on power tools.

Bill Kirkpatrick
4103 Woodland Drive
Fairfax, VA 22030-5105

I would appreciate help in locating an owner's manual and parts list or a supplier for a Craftsman jigsaw, model no. 103.20720.

Daniel Jarosz
4810 Russell Avenue
Parma, OH 44134-1863

I have an old Shopsmith jigsaw and need a fiber blade-backing guide for the blade. The machine is made by a different company now.

Robert P. Gibson
428 Elmer St.
Pittsburgh, PA 15218

I need an owner's manual and parts list for a 16 in. wood and metal band saw (model no. not available), manufactured by Walker Turner, a division of Kearney & Trecker Corp., Plainfield, New Jersey.

James W. Brynda
P.O. Box 9901
Pittsburgh, PA 15233

I'm interested in building wooden mechanical toy banks. If anyone has plans or information, I'd be happy to pay costs for copies and postage.

Earl Brassette, Sr.
2236 Iowa Avenue
Kenner, LA 70062

Recently I had to trim some limbs off an old apricot tree. Since several of the limbs were sizable (8 in. diameter), I saved them for some woodcarving projects. Does anyone have any ideas or suggestions for the use of apricot wood? It seems to work well, but tends to split.

William Beiney
Box 88 Whipple Station
Prescott, AZ 86313

I was given a Craftsman jigsaw, model no. 110.27760 and need instructions and parts list, or if someone knows the length and type of the blade it uses, I'd appreciate some help. I'll gladly pay costs.

Albert H. Wellbrock
6601 La Roche Avenue
Savannah, GA 31406

I need an owner's manual and parts list for a Sears table saw, model no. 113.29940. I'll be glad to pay expenses.

J.W. Goecke, Jr.
Box 242
Mt. Clemens, MI 48043

I'd be grateful for any help in locating a mortising attachment for a Sears upright drill press (floor model) with a $1\frac{3}{16}$ in. diameter. The drill press is about 40 years old.

Edward S. Ratigan
4352 2nd Avenue South
Birmingham, AL 35222

I would be grateful for any help in locating an owner's manual and parts list for a Ward's Powr-Kraft 10 in. 2HP radial arm saw, model TPC 26108. Be glad to pay costs.

Ray W. Spannring
P.O. Box 526
Corvallis, MT 59828

I'm looking for an owner's manual and parts list for a Boice Crane 8 in. jointer, model no. 3400. I'll pay costs for copies and mailing.

John R. Davis
2601 Wilson Cambria Road
Wilson, NY 14172

Need copies of instructions and parts list for Craftsman belt sander, model no. 315-11720. Will pay costs.

J.H. Gehman
7001 White Eagle Drive
Fort Wayne, IN 46815-7950

I'd like to locate an owner's manual or any related information for a Sears 24 in. lathe, no. 103.21600, and a Ward's Powr Kraft 6 in. jointer, no. 05ED2508A.

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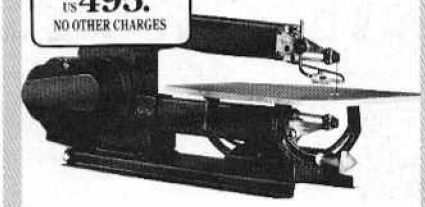

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Events

We will be glad to list as many events of interest to woodworkers as space permits. Listings are free and may include shows, fairs, competitions, workshops and demonstrations. The issue closing date is the 1st of the 2nd month preceding the cover date (7/1 for September/October; 9/1 for November/December, etc.). Please address announcements to the Events Department.

The Penland School is offering one, two and three week sessions in woodworking through September 19th. The various workshops cover wood and furniture techniques, joinery, design, turning, and more. Call or write for their catalog: The Penland School, Penland, NC 28765-0037. Phone: (704) 765-2359.

The Long's Park Arts and Crafts Festival will be held August 30 through September 1 at Long's Park, U.S. Route 30, Lancaster, PA. Select woodworkers and craftsmen from over twenty states will be exhibiting. For more information, write: Dick Faulkner, Box 5153W, Lancaster, PA 17601.

The Peters Valley Craft Center will be conducting workshops through the summer covering numerous aspects of woodworking. For catalog and information, contact: Peters Valley Craft Center, Route 615, Layton, NJ 07851. Phone: (201) 948-5200.

The Augusta Heritage Workshop will be hosting a number of concentrated classes for beginner and advanced craftspeople in Elkins, West Virginia from July 13th to August 15th. Programs for woodworkers include folk carving and whittling, log cabin restoration and making treenware. For more information, contact The Augusta Heritage Center, Davis & Elkins College, Elkins, WV 26241.

The annual Summer Woodcarving Workshops at the Villa Maria Retreat Center will be offered from August 3 - 9. Courses will include whittling, relief carving, bird carving, letter cutting, figure and caricature carving, and marquetry. For further information, write: Villa Maria Workshop, P.O. Box 37051, Minneapolis, MN 55431.

The California State Fair, to be held August 15th through September 1 in Sacramento, will feature an exhibition of realist and functional artwork in all media. The woodworking category will include furniture, carving, household objects and wares.

The 13th Annual Wood Carvers Exhibit will be presented at the American Legion Hall in Morrisville, Vermont on August 16th, 1986 from 9 a.m. to 4:30 p.m. Admission is free. For more information, contact: C.A. Brown, Box 268, Waterville, VT 05492. Phone: (802) 644-5039.

Workshops will be conducted in the repair, maintenance, and building of violins at the 13th Annual Violin and Bow Maker's Summer Institute from June 9th through August 22nd. For information, contact: Summer Violin Institute, University of New Hampshire, Office of Continuing Education, 24 Rosemary Lane, Durham, NH 03824. Phone: (603) 862-1088.

The Maritime Do-It-Yourself Show featuring "Woodworking World" will be held at the Atlantic Winter Fairgrounds in Halifax, Nova Scotia from July 18th to 20th. The show will include exhibits, demonstrations and sales of woodworking tools and supplies in addition to new products, techniques and ideas developed for the do-it-yourself enthusiast. For further information, contact: Woodworking Association of North America, P.O. Box 706, Plymouth, NH 03264. Phone: (603) 536-3876.

Nineteen classes will be offered this summer at the Cedar Lakes Crafts Center near Ripley, West Virginia in a variety of craft media. Instruction in woodworking will include: Traditional Furniture, July 21-25; Wood Turning, August 4-8; Basic Joinery, August 8-10. For further information on these and other workshops, contact the Crafts Center, Cedar Lakes, Ripley, WV 25271. Phone: (304) 372-6263.

Cook Forest Sawmill Center for the Arts will be presenting their 1986 Wood Carving Show in Cooksburg, Pennsylvania on July 19 and 20 from 10 a.m. to 5 p.m. The Sawmill Art Center is also holding classes which include Wood Sculpture (July 14-18) and Beginning Bird Carving (August 4 - 8). For more information, call (814) 927-6655.

Cabinetmakers' Supplies

Furniture Kits

As a service to our readers, *The Woodworker's Journal* periodically lists sources for various woodworking products. In this issue we've included a listing of some of the mail-order companies that sell furniture kits. In most cases these kits come pre-cut, pre-sanded, ready to assemble, and require only a minimum of tools. In addition to assembly instructions, some also supply the necessary hardware, sandpaper, and glue.

Bedford Lumber Company, Inc.
P.O. Box 65
Shelbyville, TN 37160
Cedar chest, tables, beds, etc. of cedar — walnut — cherry — oak.
Catalog $2.00, refundable on first order.

Cohasset Colonials
376EX Ship Street
Cohasset, MA 02025
Reproduction furniture kits: Queen Anne, Windsor, Shaker, Chippendale, and Federal. Kits include necessary glue, hardware, and stain.
Catalog $2.00

Craftsman's Corner
P.O. Box AP (WJW)
Des Moines, IA 50302
Broad range of solid oak furniture and accessory kits ranging from clocks and magazine racks to roll top desks, file cabinets, and tables and chairs.
Catalog free

Shaker Workshops
P.O. Box 1028WJ
Concord, MA 01742
Dining chairs, rocking chairs, candlestands, tables, beds, and other woodenware, all reproduced from specific pieces of original Shaker furniture.
Catalog $1.00, includes samples of 12 Shaker chair tapes.

The Shop
Box 3711, RD 3
Dept. WJ2
Reading, PA 19606
Reproduction ice box and turn-of-the-century hardware.
Catalog $1.00, refundable on first order.

Yield House
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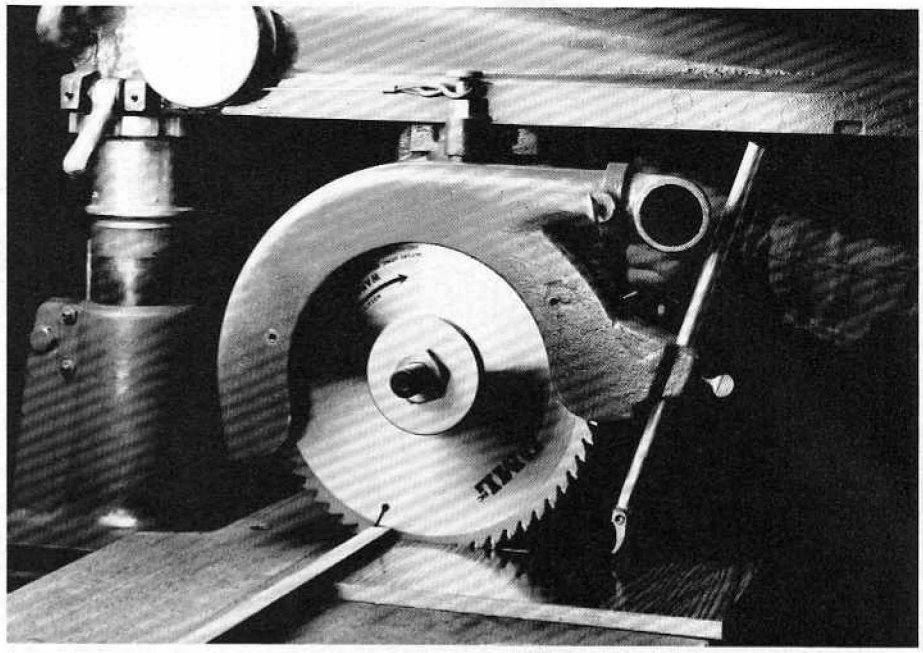

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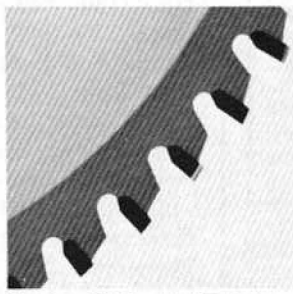

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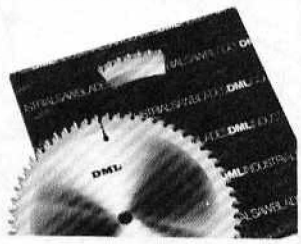

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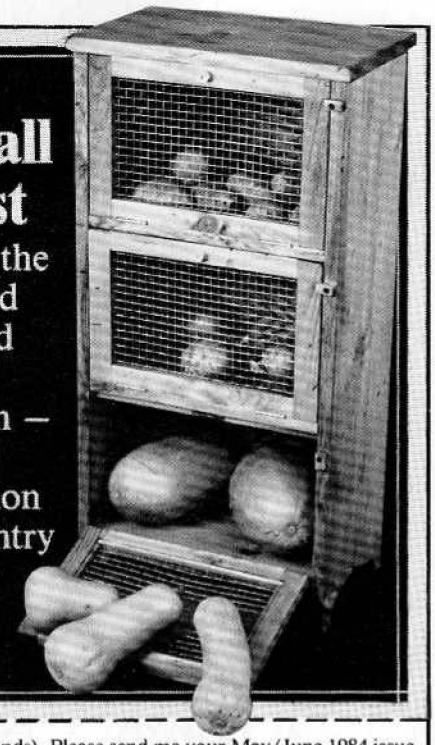

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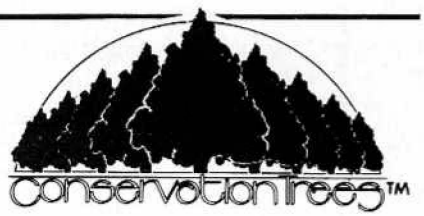

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Workshop Income

Selecting the Right Project for Production

So you've decided that it's time to realize a little profit from your woodworking hobby. Sure, you've probably sold things from time to time, but how about getting into a real production situation, making 10, 20, or more of a single item for retail sale? Great idea! But now comes the big question: What to make?

All the information we've gathered points to the fact that a small-scale woodworking business simply cannot compete on a production basis with large factories. For this reason you should direct your efforts toward a limited production mode, making something that is different and unique. The most successful small woodworking businesses are those that fill a particular need, have a product with strong individual or regional appeal, and offer this "right" product at the right price.

The temptation to make big profits from the sale of big-ticket items may be great, but unless you are in an unusual situation with a ready-made market willing to pay for these items, your best bet is to concentrate your efforts on small, low-cost items with a broad potential market.

There are three important elements to consider in determining what an ideal production-for-profit project will be: Cost, time, and marketability.

Very basically, your product must be reasonably easy to make in a fixed period of time and for a limited amount of money. It must be well-suited to construction and assembly with repetitive production operations, and as a rule, should not require extensive handwork, sanding, or finishing. After figuring in material, production, overhead, and related costs, the product should be marketable at a reasonable price. This final selling price must include a fair profit for yourself. Our research indicates that an ideal price range is from $6 to $15. You must sell on the retail level since, as noted earlier, a small woodworking shop cannot hope to compete on a cost-per-unit basis with a factory production operation.

Finding the right product, one with that special appeal, is no easy task. Yet, from reader response to projects that have appeared in *The Woodworker's Journal* over the years, we have a fairly good idea of which projects will be most successful. The Clamdigger's Basket featured on page 44 should be a winner. It meets all the established criteria, including low material cost, adaptability to limited-run production, ease of construction and assembly, and minimal sanding, finishing, and handwork. We think that this project will have strong appeal since a similar clam basket, published in our old newsprint days (and therefore no longer available in back issue), is near the top of the list of all-time favorite production projects that have appeared in *The Woodworker's Journal*. Our only reservation is that perhaps this project may be more popular here in New England than in the Midwest or South, for instance.

However, in order to provide you with a variety of potentially successful ideas, we went over our back issue listings and pulled out a sampling of those projects which reader response had indicated were especially well liked. Most of these projects were selected specifically because readers had written in and said they made and sold many of each.

The nine projects in the following list are available in back issues. Ordering information can be found on page 24. Be sure to specify both the project and the back issue.

Nov-Dec '80 (Vol. 4 No. 6) Grain Scoop
Jul-Aug '82 (Vol. 6 No. 4) Toy Jeep
Jan-Feb '84 (Vol. 8 No. 1) Veneer Bracelets
Mar-Apr '85 (Vol. 9 No. 2) Windspinner, Chinese Puzzle
May-Jun '85 (Vol. 9 No. 3) Colonial Wall Sconce, Card Box
Jul-Aug '85 (Vol. 9 No. 4) Stamp Dispenser
Jan-Feb '86 (Vol. 10 No. 1) Valentine Box

The projects listed above cover a wide range and all are relatively easy to make. Although some require more handwork, sanding, finishing and attention to detail than others, keep in mind that it is often the attention to the small details, and the addition of a "personal touch" that makes one item preferable to another in a potential buyer's eyes.

Before starting any project, plan *everything*. Since every additional woodworking operation adds time (and time is money), keep steps to a bare minimum. If the project can be built from standard thickness material and commonly available board widths, then you can often eliminate thickness planing, ripping, jointing and edge-gluing. With this thought in mind, we often design easy-to-build pine projects around common 1 × 4, 1 × 6, 1 × 8, 1 × 10, and 1 × 12 pine stock. Of course, the plan must be developed with respect to the actual dimensions which, for a 1 × 6, are ¾ in. thick by 5½ in. wide; for a 1 × 8, they're ¾ in. thick by 7¼ in. wide, etc.

When multiple parts must be band sawed from a single board, lay out carefully to make maximum use of the stock with minimum waste. Everytime you must stop to relocate the table saw fence, reset the dado head, or change from the dado back to a regular blade, more time is involved. Coordinate all operations for the most economical use of both material and time.

There are three important elements to consider in determining what an ideal production-for-profit project will be: Cost, time, and marketability.

Whenever possible, utilize jigs, templates, forms, power tools and accessories to speed repetitive tasks and eliminate unnecessary handwork. Instead of rounding over edges by hand, for instance, use a bearing-guided round over bit. Where a band sawed form might require extensive hand sanding to remove band saw marks, use a template and the router instead to clean up the edges. It might take a little longer at first to make the template, but by the time you have completed the twentieth piece, chances are you will have saved hours overall. Be creative, innovative, and don't be afraid to try something different. Good luck, and happy (and profitable) woodworking! WWJ

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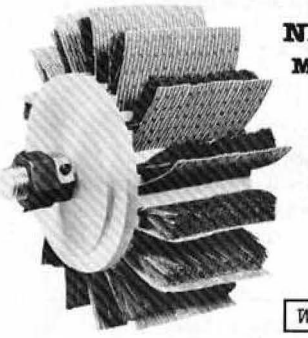

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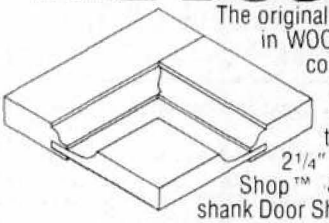

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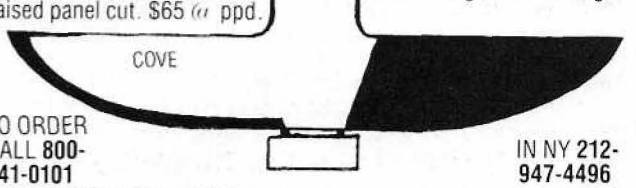

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Restoring Antiques

More About Warped Boards

by John W. Olson

As discussed in my two previous columns, wood is made up of hollow cells which expand as they absorb moisture and shrink as they dry out. A board with more moisture on one side than the other will probably warp because the cells on the side with the greater moisture expand more than those on the opposite side. This type of uneven moisture content is the cause of most warp, and it can usually be solved by techniques that involve wetting or drying one side or the other to balance the moisture. Last issue in this column, I talked about several of those techniques.

However, uneven moisture content by itself is not always what causes a board to warp. A tree normally grows reasonably straight up and down, but for various reasons some will grow with a distinct tilt or lean to one side. As a leaning tree grows, stresses develop in the wood fibers of the trunk, and boards cut from that trunk will include those stresses. When combined with uneven moisture content, such stresses often create a warping problem that can't be solved by the usual methods. Generally, the answer is to use some sort of mechanical means to physically straighten the board, or to relieve the internal stress by removing some of the stock.

Cleats

One or more wooden cleats screwed to the stock can be an effective way to deal with a stubborn warp problem. They are commonly used to flatten wide tabletops and carcase sides.

There are several things to consider before cutting the cleat stock. Since the warped stock is pulled to the cleat, you will need a flat cleat to make sure that you end up with a flat surface. Also, the cleat must be strong enough to straighten the board without itself bending. Try and locate the cleats where they are least likely to be seen. If one large cleat looks unsightly, try substituting two or more smaller ones as their combined strength can be just as effective. Before assembly, I like to chamfer the exposed corners and sand all surfaces thoroughly, then apply a final finish that matches the piece.

Don't use glue if the cleats are installed across the grain (as is usually the case) and be sure to slot the screw holes. The stock must be free to expand and contract with changes in humidity.

Rods

I once encountered an old bench with a seat that refused to remain flat. The seat measured 1¼ in. thick by 14 in. wide by about 32 in. long. Cleats would look unsightly so I felt another technique was in order.

The seat was clamped flat then, using a long ½ in. diameter drill bit, I bored three holes along the 32 in. seat,

one 8 in. from each end and one at the centerpoint. Each hole was centered on the 1¼ in. thickness. Starting at the back edge, I bored across the 14 in. width, stopping at a point ½ in. from the front edge. Then, in each of the three holes, I inserted a ½ in. diameter by 13 in. long steel rod. The rods flattened the seat quite nicely. A ½ in. diameter by ½ in. long plug was then glued into each hole to conceal the rods.

I also used the same trick successfully on a 15/16 in. thick drop-leaf on a cherry table. Apparently, the leaf had some internal stresses set up by the presence of two large knots and some crooked grain. I could straighten it by adding moisture to one side, but it would return to a cupped condition when completely dry. Three ⅜ in. diameter steel rods solved the problem.

Kerfing

Another method that sometimes works is to cut kerfs on the back side of a board after it has been straightened. The kerfs may be cut with a table or radial arm saw or a router. They should be no more than ⅛ in. wide and extend into the board not more than two-thirds to three-quarters of the total thickness. The kerfs can be ⅛ in. to ¼ in. apart.

Care should be taken not to overly weaken the board by cutting too deep or cutting too near the sides and ends. To be successful, the board will have to be clamped in the flat condition for at least several days, perhaps up to a couple of weeks. This will allow the wood exposed in the kerfs to stabilize. Be sure to leave most of the kerfed area uncovered so as to let air fully circulate.

Ripping

Where feasible, badly cupped, twisted, or curved stock can sometimes be straightened by ripping the board into several narrow strips. The sawn edges of these strips are jointed square, then all the strips are edge-glued back together in their original orientation.

To edge-glue, apply a thin coat of glue to the mating surfaces and clamp firmly with bar or pipe clamps. Use clamp pads to protect the stock. A pair of waxed cleats clamped across the grain on each end will keep the surfaces from slipping out of alignment when clamping pressure is applied. Set aside and allow to dry overnight.

Keep in mind that each ripping cut will remove about ¼ in. of stock (⅛ in. for the saw kerf plus two 1/16 in. jointer cuts) so the reassembled board will be narrower than the original. How much narrower depends on how many ripping cuts you need to make. It may be necessary to add an additional strip to get back to the original width.

Extensive planing of the top and bottom surfaces can often be counterproductive because a good grain match becomes increasingly difficult as additional stock is removed. This problem is likely to occur if the glued board is flattened on one side using the jointer, then run through the thickness planer to flatten the other. You'll probably be better off using a hand plane and taking light cuts. It may take a bit longer but you'll have a better grain match when finished. Before planing, use a sharp chisel to clean off any excess glue that may have squeezed out and dried.

Warped boards regularly show up on old (and sometimes new) furniture, but as we've learned, there are a number of relatively simple and inexpensive ways to deal with the problem. Hopefully you'll keep them in mind next time you have a board with a bend that shouldn't be there. WWJ

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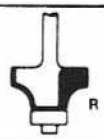		ROUND OVER				
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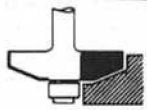	#15	RAISED PANEL	20° Angle	1-5/8"	1/2"	25.00
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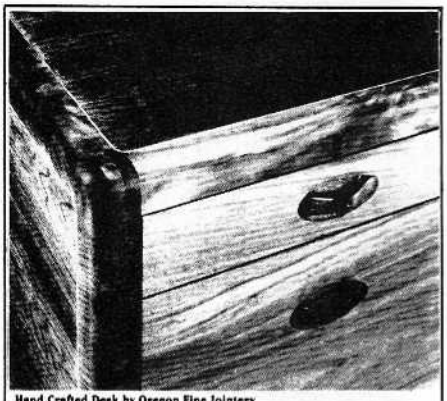
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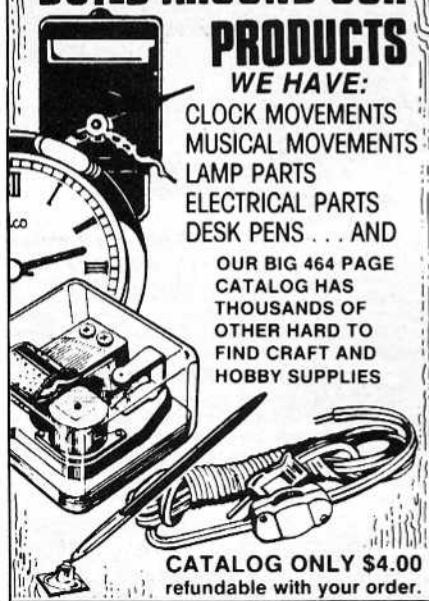

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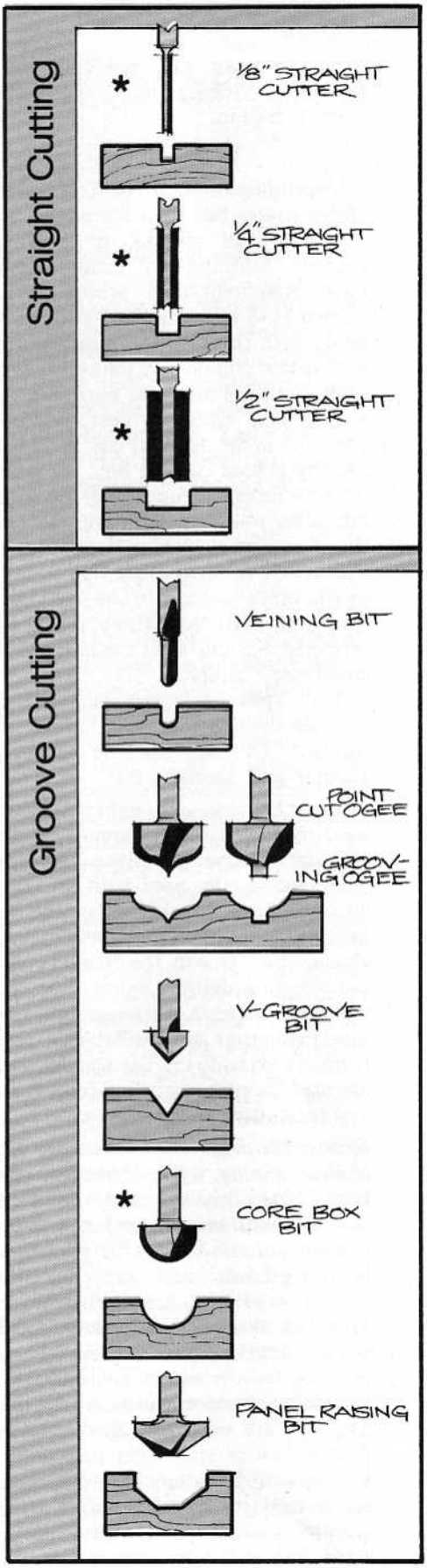
General Care & Sharpening

Care of router bits is extremely important if you expect them to perform as intended for as long as possible. Bits should always be stored so they are prevented from bumping against each other or into anything else. We have constructed a practical closed plywood box for all our bits. Never simply store loose bits in a drawer, can, or jar, and never drop a router bit. Carbide, because of its hardness, will chip or shatter if dropped on a hard surface such as the saw table or a cement floor.

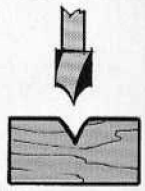
Clean router bits will cut smoothly, while a pitch or resin buildup may cause bits to burn. Spray-on oven cleaner can be used to remove any pitch or resin.

Although much has been written about sharpening router bits, we don't recommend do-it-yourself sharpening. When our router bits become dull (a rare occurrence with carbide), we send them out to a professional sharpening service at about $5.00 per bit. The professionals have the right equipment, and the bits come back as sharp as when new. As for sharpening HSS bits, given the cost it's probably cheaper in the long run to simply buy a new bit. This is no doubt the reason so many woodworkers have a collection of old and worn out HSS bits. Seems it's hard to throw those old bits out, even if they don't work anymore. WWJ

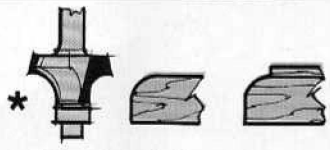


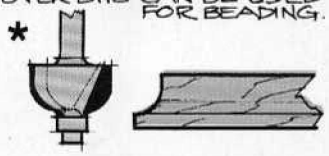
*Starred bits recommended for comprehensive starter set.

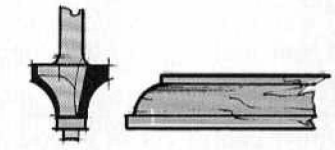
Groove Cutting (cont'd)

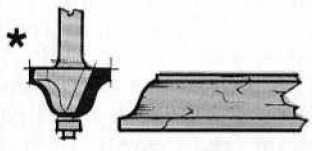


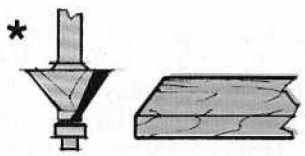
Edging



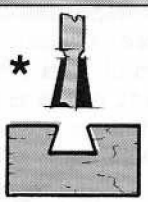




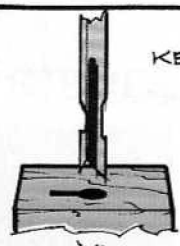


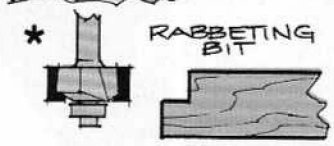


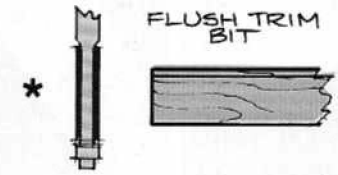
Special Purpose

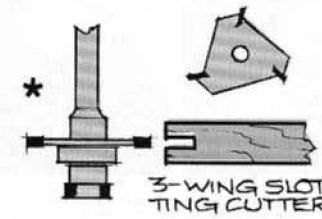


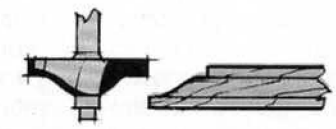
Special Purpose (cont'd)



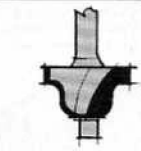


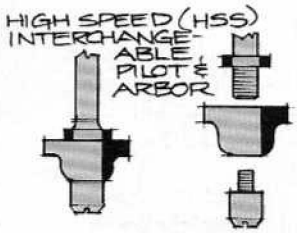


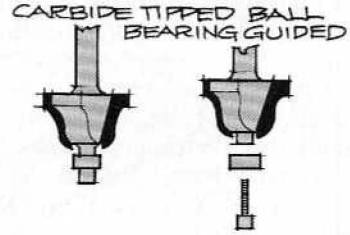




Pilot Options







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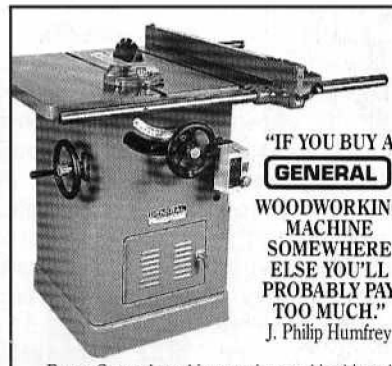

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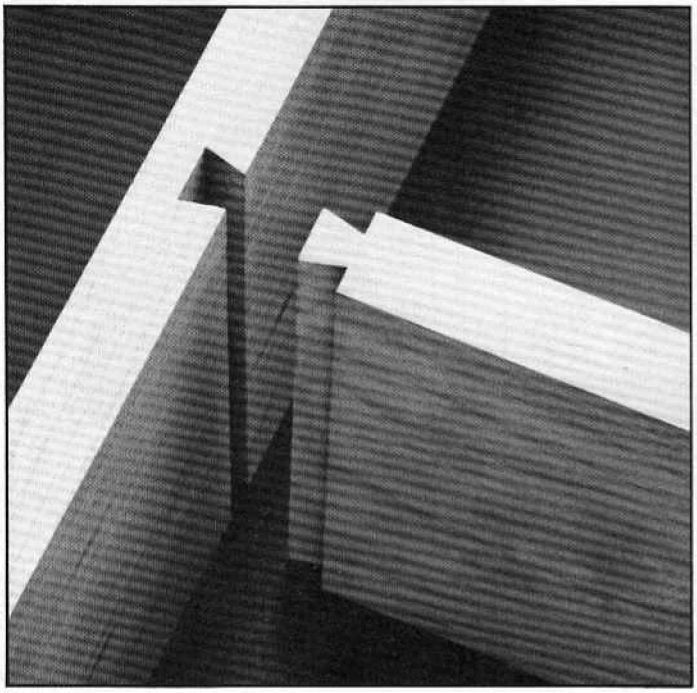
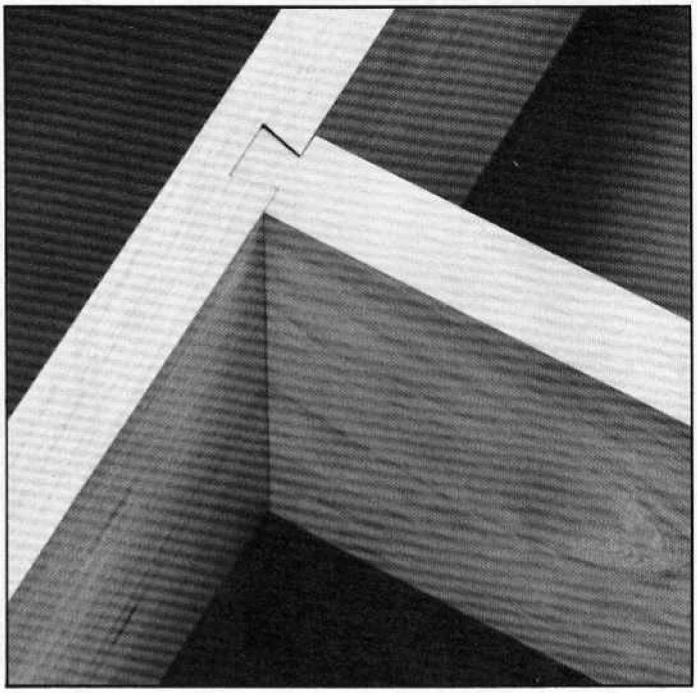
Special Techniques

The Sliding Dovetail Joint



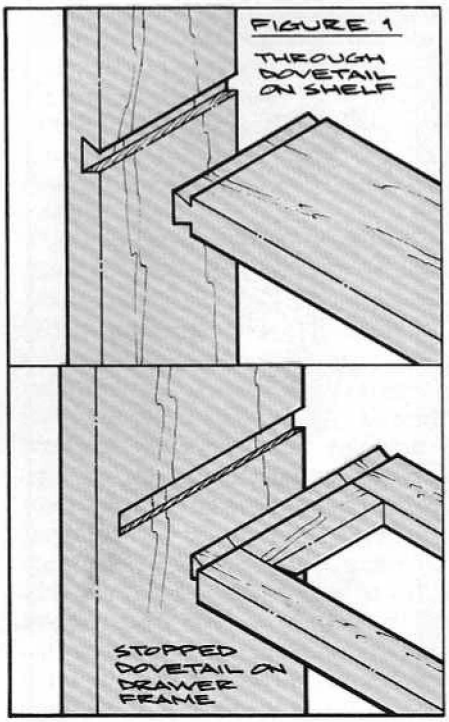


The physical qualities and characteristics of solid wood can present a variety of problems, particularly in the construction of carcases, cabinets, and shelves. When members must be joined at right angles, or perpendicular to each other, no matter what type of joint is used, the problem of end grain is significant, thereby severly limiting the effectiveness of any glue joint.

With limited glue strength, mechanical and other means must be used to provide the required stability within the joint. Dowels, screws and plugs, and mechanical devices, such as threaded inserts, are some of the available options.

For fine furniture, contemporary work, or in any project where the integrity of the joint is important, but plugs or mechanical means are not desirable, an ideal alternative is the sliding dovetail joint.

The sliding dovetail is essentially a single long dovetail which is slid into a corresponding dovetail mortise. Depending on the particular application, the dovetail may either be "through" or "stopped" (see Fig. 1). The through dovetail is visible at the front, and makes an attractive detail on certain types of work. It is also easier to cut than the stopped dovetail, since no hand chisel work is required. The stopped dovetail would be the obvious choice in contemporary projects or anywhere a clean look with no exposed joinery is preferred. The handsome contemporary wall unit featured on page 31 of this issue makes use of the stopped dovetail.



Although the sliding dovetail pin and groove can be cut in several different ways, including on the table saw, with the radial arm saw, or by hand, the most accurate way to accomplish the cuts is with a router, the router table, and a dovetail bit. The dovetail bit provides an exceptionally clean cut, and will result in a tighter fitting joint than hand or other machine cutting methods.

For this feature we'll concentrate on ¼ in. and ½ in. dovetail bits, with ¼ in. shanks. Larger ¾ in. and 1 in. dovetail bits are available, but because of their size they have ½ in. shanks, and require larger, more powerful (and expensive) routers to accommodate the ½ in. shank size. Note: Our designer/craftsman, Phil Bacon, emphasizes the importance of selecting carbide-tipped instead of high-speed steel dovetail bits. Phil points our that "carbide will last, on average, about 40 times as long as high-speed steel." Although most carbide-tipped router bits are priced at three to four times the cost of

similar high-speed steel bits, their increased cost is primarily because of the high cost of tungsten carbide, and the fact that many carbide bits feature ball-bearing pilots. Dovetail bits have no bearing or pilot and, being fairly small, they require only a small amount of carbide. Carbide-tipped dovetail bits are only about 25 percent more expensive than high-speed steel dovetail bits. Given the numerous advantages of carbide over high-speed steel (see The Beginning Woodworker feature on page 16), and this relatively modest price differential, we strongly recommend the purchase of tungsten carbide-tipped dovetail bits for this technique.

The sliding dovetail is primarily a mechanical joint. The long dovetail cut into the end of one board (usually the horizontal member or shelf) locks into the corresponding dovetail groove cut into the piece which it is perpendicular to (usually the vertical member or side). Because the strength of the joint is directly related to the accuracy with which both mating pieces are cut, all work should be precise.

As with many aspects of woodworking the sliding dovetail joint is not in itself complicated. However, like cutting and fitting dovetails and box joints, or making frame and panel doors, there are finer points that must be understood if the joint is to fit up and assemble properly. For most of us, discovering these finer points is usually a process of trial and error requiring time and many practice pieces before all the kinks are worked out.

The following step by step instructions guide you through cutting the sliding dovetail joint. Remember that maintaining control of the router, proper feed pressure, and speed are important, both when cutting the groove, and when feeding the stock through the bit on the router table. Selecting clear, even-grained stock will help avoid problems.

Step 1: *Bit and Stock Size*

The dovetail is measured from the widest part of the tail, as shown in Fig. 2A. The ½ in. dovetail bit is used with stock from ½ in. to ¾ in. thick, while the ¼ in. bit is used for stock from ¼ in. to ½ in. thick. In practice, however, Phil points out that the stock should always be a little thicker than the widest part of the tail. This is because, if the stock is exactly the

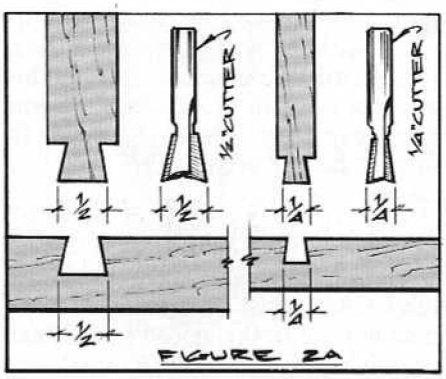
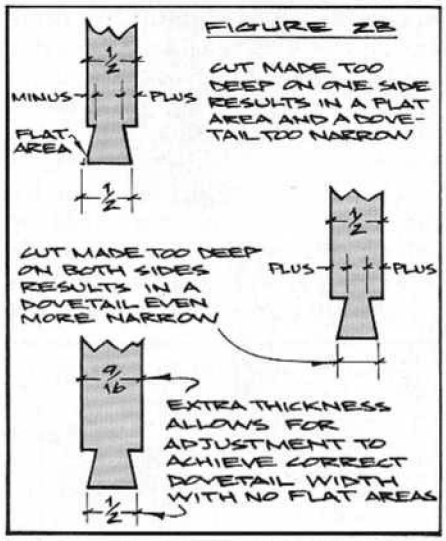
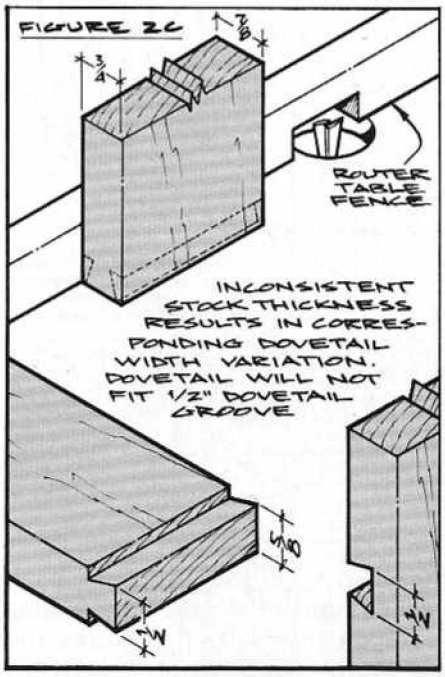


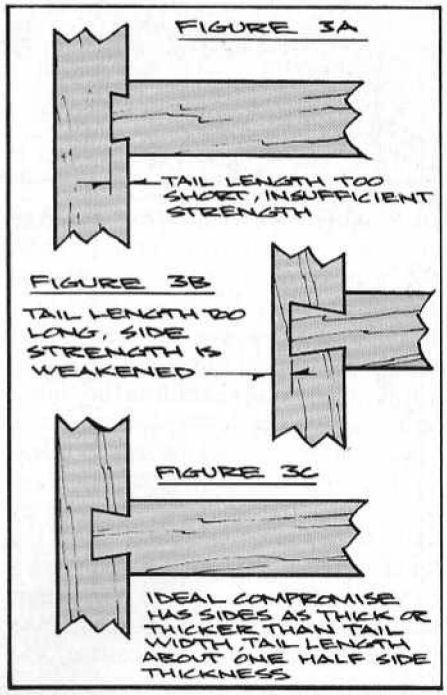
FIGURE 2A





desired tail width, and your router table fence settings are not perfect, you could end up with a little flat on one side of the tail and the tail slightly undersize. As shown in Fig. 2B, an initial fence setting that results in a cut a hair too deep will mean the fence must then be repositioned to compensate on the opposite side, resulting in the flat area. If the fence were not repositioned, the tail would be even narrower, resulting in a very sloppy fit within the corresponding dovetail groove. Dimensioning the stock a hair thicker than the intended tail width will provide a margin for error.

Phil also stresses the need for the stock to be planed to a consistent thickness. This is because the router table cuts that form the tail will gauge off the router table fence. As illustrated in Fig. 2C, a thickness variation will result in a corresponding inconsistent dovetail width dimension. Then, of course, the tail would not fit into the dovetail groove, which will be exact and consistent. Figures 2B and 2C show the ½ in. dovetail for purposes of illustration, however the principles involved will be the same for the ¼ in. dovetail joint.



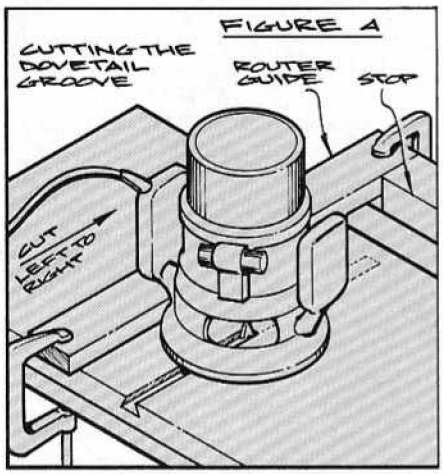
Step 2: *Cutting the Dovetail Groove*

The dovetail groove in the side member is cut first, because the tail is made to fit within the groove and test fittings will be needed. Although the length of the dovetail, and therefore the depth of the dovetail groove, can be adjusted to accommodate the thickness of the material used for the sides, keep in mind that the longer the tail, the stronger it will be. As shown in Fig. 3A, too short a tail will not provide sufficient strength; on the other hand, if the tail is too long, the sides will be weakened (Fig. 3B). The ideal compromise has the side

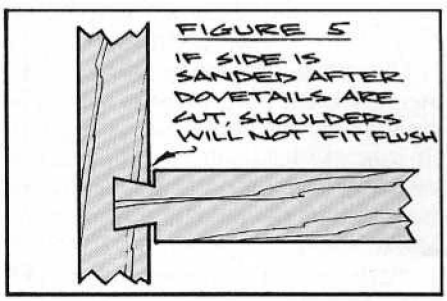
(continued on next page)

material as thick or somewhat thicker than the tail width (Fig. 3C).

Locate the shelf position on the sides, check for squareness, mark for the dovetail groove, and clamp a temporary fence in place to guide the router. Set the bit depth and make the dovetail groove cut by moving the router from left to right as shown in Fig. 4. This will result in the dovetail cutter pulling itself into the fence, making for an easier and smoother



cut. *Note:* For stopped dovetail grooves, a stop must be positioned so the groove is stopped the desired distance from the edge. With the stopped groove, the dovetail cutter should be backed out *with the router on*. Remember that guiding the router tight against the fence is every bit as important when backing out as it was while going in. The end of the stopped dovetail groove is finished by hand with the chisel. *Tips:* With the fence in place, you may wish to use a straight cutter to remove the center section of the groove before switching to the dovetail bit. Of course, the

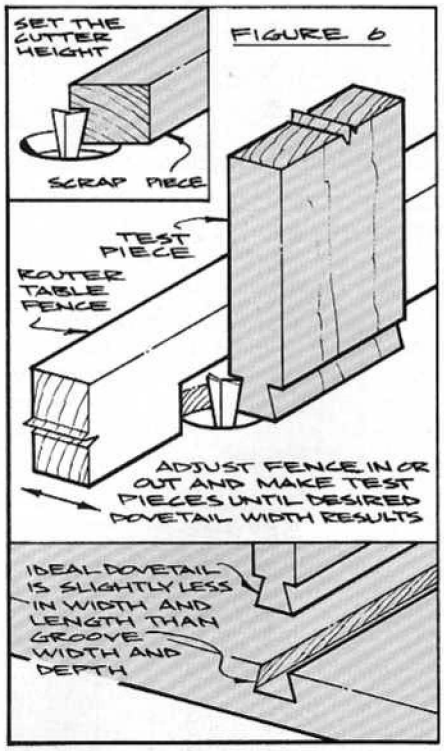


straight cutter can be no wider than the neck of the dovetail groove at its narrowest point. Final sanding on the inside surface of the sides must be completed *before* the grooves and tails are cut. If the side is sanded after the grooves and tails are cut, the shoulders will not fit flush (Fig. 5). Also, without readjusting the depth setting, use the router and dovetail bit to cut a dovetail groove into the end of a scrap piece for use as a guide in setting the router table bit height in the next step.

Step 3: *Cutting the Dovetail*

The dovetail is cut on the router table. As noted earlier, the stock thickness must be consistent. Make certain that the end is perfectly square. Set the dovetail cutter depth so that it will be equal to the dovetail groove depth. Rather than measuring, the best way to do this is to use the scrap piece made in Step 2 (see Fig. 6, "Set the Cutter Height").

After the bit height has been set, the fence must be positioned to achieve the proper dovetail width. The only way to accomplish this is by using scrap pieces milled to the same

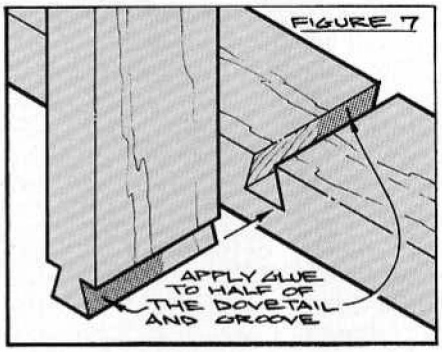


thickness as the stock into which you will be cutting the tails. After cutting dovetails into a few test pieces you should have arrived at the correct fence setting. With the right setting, the dovetail will slide easily into the corresponding dovetail groove without either binding or being sloppy. *Remember:* Too loose and the joint will not be strong enough; too tight and with the addition of glue (which usually causes the wood to swell slightly), you will never complete the assembly. The ideal dovetail will be just a hair less in width and height than the corresponding groove width and depth (see Fig. 6).

For stopped sliding dovetails, such as on our wall unit, the dovetail must be cut back as needed to match the stopped dovetail groove.

Step 4: *Glue Up and Assembly*

Phil notes that the final step, the assembly process, is the most critical. He points out that even if the dovetail fits easily within the groove when dry, there is a possibility that it might bind within the groove after glue is ap-



plied, especially if too much glue is applied and if you wait too long before assembly, allowing the glue the opportunity to swell the wood.

As illustrated in Fig. 7, apply the glue only to the front half of the groove and the back half of the dovetail. This procedure will make the assembly easier and reduce the chance of binding. Note also that the glue is applied only to the beveled sides of the dovetail and groove, since all other parts of the joint present a true end grain situation, and will therefore gain little from the addition of glue. Work quickly and use *very little glue.* Remember, since the sliding dovetail joint is mainly a mechanical connection, the glue is secondary. *Tips:* When sliding a dovetailed shelf or frame into a preassembled carcase, be sure to work both sides in evenly. With stopped sliding dovetails, apply glue to the stopped half of the groove and the opposite half of the tail.

The sliding dovetail is an exceptionally strong mechanical connection and has many uses in woodworking. Once you have gained some experience with it, the little nuances of proper sizing, cutting, fitting, glue-up and assembly will become second nature, and you will use this joint with confidence. WWJ

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TR 100	3 blades & Dado set			399.00	255

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Model		List	Sale
4300DW	Jig Saw	158	99
5081DW	3 3/8" Saw Kit	174	95
5600DW	6 1/4" Circular Saw	224	125
9035DW	Finishing Sander	128	73
6010DWK	3/8" Cordless Drill Kit	152	88
6010SDW	3/8" Cordless Drill	84	45
6400DW	3/8" Hammer Drill	188	105
DA3000DW	3/8" Angle Drill	176	98
6010DL	3/8" Drill w/Flashlight	162	89
6012HDW	3/8" 2 spd Driver Drill w/Bat & Metal Case	178	98
DK1002	3/8" Drill w/Flursnt Lt	164	90
6710DW	Cordless Screwdrvr Kit	148	84

DELTA BENCH TOP TOOLS

Model		List	Sale
11-950	8" Bench Drill Press	124	100
28-160	10" Bench Band Saw	158	125
40-500	15" Scroll Saw	105	85
23-680	6" Grinder Bench	62	50
23-880	8" Grinder Bench	99	85

MAKITA TOOLS

		List	Sale
BO4510	Sander	79	43
9900B	3"x 21" belt sander	198	119
9924B	3"x 24" belt sander	189	130
9924DB	3"x 24" b/sand. w/bag	214	130
9035	1/3 sheet finish sander	79	48
9045B	1/2 sheet finish sander	156	90
9045N	1/4 sht fin. sand. w/bag	158	105
4200N	4 3/8 circ. saw 7.5 amp	152	93
5008NB	8 1/4 circ. saw 13 amp	178	105
5201NA	10 1/4 circ. saw 12 amp	348	215
4300BV	v/sp jig saw 3.5 amp	192	120
4301BV	orb v/sp jig saw 3.5 amp	208	125
JR3000WL	2 sp recip saw w/case	168	120
JR3000V	vs recip saw w/case	178	120

• • • MAKITA TOOLS • • •

SPECIAL PROMOTION

LS1000	New 10" Mitre Box	348	198
792210-7A	Carbide Bld for above	45	31
9820-2	Blade Sharpener	244	159
741074-9	60 (coarse) Grdg Whl	33	23
741070-7	1000 (med) Grdg Whl	30	22
741071-5	6000 (fine) Grdg Whl	43	30
1900BW	3 1/4" planer w/case	154	92
1100HD	3 1/4" planer w/case	278	160
3608BK	3/4 hp router w/case	132	85
3601B	1 3/8 hp router	168	115
3709B	1/2 hp trimmer 28,000 rpm	124	82
BO4530	6" Round Sander	84	48
DA3000	3/8" angle drill	158	105
DP4700	1/2 v/sp w/rev' 4.8 amp	154	92
HP1030W	3/8 v.s.r. hammer drill w/case	145	98
6300LR	1/2" angle drill w/rev	229	152
8419BB-2W	1/2" s sp. hammer drill w/case	238	150
GV5000	Disc Sander	79	53
6800DB	2500 rpm 3.5 amp	123	79
6800DBV	0-2500 rpm 3.5 amp	133	89
6801DB	4000 rpm 3.5 amp	123	79
6801DBV	0-4000 rpm 3.5	133	89
2030n	12" planer/jointer	2160	1475
2040	15 5/8" planer	1780	1195
1805B	6 1/8" planer kit w/case	416	265
JV1600	var. speed jig saw	145	89
JV2000	var. speed orb. jig saw	165	100
5005BA	5 1/2" circular saw 8 amp. with brake	154	98
9207SPC	7" var/speed electronic sander/polisher	209	130
9303BH	4 1/2" sander-grinder kit	146	95
4014NV	var/speed blower	128	79

DOWL JIGS

MODEL	DOWL-IT	List	Sale
1000		32.95	23.95
2000		42.95	32.95

RECORD VICES

52D	7" jaw - 8" Opening	69.00	51.00
52 1/2D	9" Jaw - 13" Opening	92.00	76.00

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#8500	Box of 50 - 10.00-Case of 600	89.00	
#8560	Box of 15 - 13.50-Case of 180	135.00	

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Model	STANLEY	List	Sale
33-116	PL-315 3/4" x16" Rule	15.95	7.50
33-320	PL-320 3/4" x 20C Rule	16.95	7.95
33-425	PL-425 1" x 25' Rule	18.95	8.95
33-430	PL-430 1" x 30' Rule	20.95	9.95

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AMERICA'S LOWEST PRICED TOOLS

★ PLUS — FREE FREIGHT ★

ON EVERY ITEM

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#314	4 1/2" Trim Saw	
List 180		SALE 109
#345-1	6 1/2" Top Hdle	
List 151		SALE 100
#617	7 1/4" Push Hdle	
List 166		SALE 96
#587	7 1/4" Speedtronic	
List 199		SALE 125
#315-1	7 1/4" Top Hdle	
List 166		SALE 96
#368-1	8 1/4" Top Hdle	
List 176		SALE 110

BELT SANDERS by PORTER CABLE

#363 — 4"x 24" w/o Bag		
List - 280	Sale - 185	
#362 — 4" x 24" w/Bag		
List - 295	Sale -198	
#503 — 3" x 24" w/Bag		
List - 510	Sale - 350	

DELTA

#34-410 — 10" CONTRACTORS SAW

w/Stand & 1 1/2 H.P. Motor

SPECIAL PRICE 679.00

FACTORY REBATE. 100.00

579.00

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SUPER CORDLESS SPECIALS from BLACK & DECKER

Model	DRILL KITS	List	Sale
1930	3/8" rev/hi speed	165	110
1950	3/8" High Torque	165	110
5930	Reversible Hammer	179	120
1970	3/8 rev/hi torque screwdriver	179	120
1980	Rev/adj. clutch Scrudrill	179	120

BRAND NEW! SUPER SPECIALS from MILWAUKEE

0214-1	3/8" c/less drive/drill	159	109
8975	H.D. heat Gun, 11.6A Low 570°F - High 1000°F	74	49
5920	belt sander 3x24 w/o bag	289	199
5925	belt sander 3x24 w/bag	309	215
5930	belt sander 4x24 w/o bag	299	209
5935	belt sander 4x24 w/bag	319	214

PORTER-CABLE = NEW ITEMS +

Model		List	Sale
555	Drywall Driver 0-4000 Rev	115	85
367	3 1/4" Plane 6.5A	170	115
5009	Mortise & Tenon Jig	50	34
351	3" x21" Belt Sander	189	125
352	3" x21" Belt Sndr w/bag	199	135
9810	Cordless Screwdrvr kit	175	115
320	Abrasibe Plane 3A	129	91

★ ★ ROUTER RIOT ★ ★ by PORTER-CABLE

Model		List	Sale
100	7/7 H.P. 6.5 amp	141	98
630	1 H.P. 6.8 amp	150	100
690	1 1/2 H.P. 8 amp	194	130
691	1 1/2 H.P. D-Hdle 8 amp	218	145
536	1 1/2 H.P. Speedmatic Double Handle	300	190
537	1 1/2 H.P. Speedmatic Double Handle	315	215
520	3 H.P. Production	460	270
518	3 H.P. Micropressor 5-sp	490	345

TRIMMERS BY PORTER-CABLE

309	3.8 amp laminate trimmer	130	90
310	3.8 amp laminate trimmer	190	135
312	offset base laminate trim	205	140
319	tilt-base laminate trim	215	150

★ X-TRA SPECIALS ★

MAKITA TOOLS

		List	Sale
6010DL	C/less Drill w/flashlight-charger & case	162	90
DP3720	3/8 drill Rev. 0-1800 rpm	90	47
6510LVR	3/8 drill Rev. 0-1500 rpm	116	67
6013BR	1/2" Drill rev. 6 amp	174	100
5402A	16" Circular Saw-12 amp	468	315
2414	14" Cut Off Saw-13 amp	282	169
3612BR	3 HP Plunge Router	286	175
9401	4x24 belt Sander w/bag	248	150

PORTER-CABLE

		List	Sale
696	H.D. Shaper Table	150	105
695	H.D. 1 1/2 hp Router/Shaper	278	190
399	Drywall Cut-Out Unit	100	70
736	V/Speed *Speedtronic* Band Saw	450	330
7564	1/2" X.H.D. Drill 8 amp	205	145

BOSCH TOOLS

		List	Sale
1581VS	Top Handle Jig Saw	225	126
1582VS	Barrel Grip Jig Saw	126	118
1604	3 1/4 H.P. Router	199	118
1942	Heat Gun 650°-900°	99	85
1272	3x24" Belt Sander	259	159
1272D	3x24" Belt Sander w/bag	274	169
1273	4x24" Belt Sander	274	169
1273D	4x24 Belt Sander w/bag	289	179

DELTA

		List	Sale
34-010	Motorized Mitre-Box	231	149

★ NEW LOW PRICES ★ PONY CLAMP FIXTURES

Model		List	Sale	Lots of 12
#50	for 3/4" Black Pipe	11.23	7.15	79.00
#52	for 1/2" Black Pipe	9.36	6.10	67.50

JORGENSEN HAND SCREWS

Model	Jaw Length	Open Cap.	List	Sale	Box of 6
#5.0	4"	2"	11.59	7.25	39.15
#4.0	5"	2 1/2"	12.45	8.10	43.75
#3.0	6"	3"	13.36	8.50	45.95
#2.0	7"	3 1/2"	14.36	8.95	48.35
#0	8"	4 1/2"	15.97	9.95	53.75
#1	10"	6"	18.25	11.35	61.25
#2	12"	8 1/2"	20.94	13.60	72.95
#3	14"	10"	26.56	16.75	91.35
#4	16"	12"	34.55	23.75	128.25

JORGENSEN BAR CLAMPS STYLE 37 — 2 1/2" Throat 1/4" x 3/4"

Model	Jaw Length	List	Sale	Lots of 6
#3706	6"	7.88	5.50	29.70
#3712	12"	8.73	5.95	32.13
#3718	18"	9.64	6.95	37.53
#3724	24"	10.54	7.35	39.69
#3730	30"	11.76	8.25	44.55
#3736	36"	12.85	8.95	48.33

Who Has The Saws That Cut It Across The Board?

BLACK & DECKER of course!!!

Model	WORM DRIVE SAWS	List	Sale
3050	6 1/2" 12 amp - 4600 rpm	247	169
3051	7 1/4" 13 amp - 4300 rpm	232	149
3052	8 1/4" 13 amp - 4300 rpm	247	169
	SUPER SAWCATS		
3047-09	7 1/4" w/brake - 12.5 amp	226	149
3048-09	8 1/4" w/brake - 13 amp	240	155
	BUILDERS SAW CAT		
3030	7 1/4" 13 amp - 5800 rpm	155	100
3035	8 1/4" 13 amp - 5800 rpm	175	125
3034	7 1/4" 13 amp - 5800 rpm	162	115
3033	6 1/2" 13 amp - 5800 rpm	162	115
	JIG SAWS		
3157-10	var/sp orb action d/hdl	174	115
3153-10	var/speed 4.5A 0-3100	158	105
3159-10	2 sp orb action barrel grip	178	120
	CUT SAW KITS		
3103	2 sp 6 amp-2400 strokes	163	100
3105	v/sp 6 amp-2300 strokes	170	110
3107	v/sp orb 6A 0-2300 strokes	183	119
4300	Drill Bit Sharpener	289	205
1321	1/2" drill 450 rpm 6 amp	175	115
4010	Palm Sander	80	48
4015	1/2 Sheet Finish Sander	160	105
	DRYWALL GUNS		
2034	v.s.r. 0-4000 rpm	121	79
2037	v.s.r. 0-4000 rpm	139	89

"Door Openers" from MAKITA

9501B	4" Grinder Kit	119	55
2708	8 1/4" Table Saw	348	199
5007NB	7 1/4" Circ. Saw	158	94

MILWAUKEE BUY OF THE YEAR

Model 6365 — 7 1/4" Circular Saw

List $159.00 Sale $99.00

Lots of 3 — $289.00

Brand New **• PORTER CABLE**

Model 7548 Top Hdle Jig Saw

LIST 199 — SALE 129.95

Model 7648 Barrel Jig Saw

LIST 199 — SALE 129.95

PORTER-CABLE

		List	Sale
9546	HD v/s bayonet saw w/case	255	169
9627	2 sp. tiger saw kit 8 amp	193	130
9629	V/sp. tiger saw kit 8 amp	204	135
505	H.D. 1/2 sheet finish sander	175	100
330	spd bloc sander 1/4 sheet sz	87	54
304	Professional 7" disc sander	169	120
305	Professional 7" polisher	169	120
7511	3/8" xtrahvy v/s drill 5.2 amp	164	115
7554	1/2" xtra hvy drill 8 amp	210	150
9652	Versa-Plane Kit	419	285
9118	Porta Plane Kit	289	190

DRYWALL SHOOTERS

7544	5.2 amp — 2500 rpm	158	105
7545	5.2 amp — 0-2500 rpm	158	105

AEG POWER TOOLS

Model		List	Sale
EZ 501	C/less Scrwdrvr **Brand New**	59	35
EZ 502	C/less Scrwdrvr-190 rpm	98	52
EZ 505	C/less Drill/Driver	139	79
EZ 506	C/less Electronic Dril/Drvr	159	94
EZ 581	C/less Caulk Gun var/sp	179	106
SCR1E	Drywall Screwgun 0-2000	125	74
SCR11E	Drywall Screwgun 0-4000	125	74
BE8RL	3/8" var/sp drill 3.8 amp rev	86	51
BE10RL	3/8" var/sp drill 5 amp rev	125	74
SBE401RL	3/8" Ham Drill v/sp h d	88	52
SE2E13RL	1/2" Ham Drill 2 sp h d	169	101
TC25E	Tech Driver v/sp 5 amp	150	89
PC70	7 1/4" Circular Saw 12 amp	157	93
VS130	Orb Sndr 20,000 OPM 1/3 sh	75	48
VS260	Orb Sndr 25,000 OPM 1/2 sh	156	88
VSS260	Orb Sndr 25,000 OPM w/bag	189	118
Hbse75S	Belt Sander v/sp 3" x 21"	199	118
BSPE60	Jig Saw Orb v/sp 4.6 A w/case	214	127
RSK500	Recip Orb Saw 10 amp	229	136

ROTARY HAMMERS

PHE 16RL	3.8 amp 5/8" capacity in concrete	269	175
PH 210	5.2 amp 3/4" capacity in concrete	398	260
PHE 20	Same as above — except var/sp 0-750	418	270
PHD 26	6.3 amp 1" capacity in concrete	495	320
PH 38	7.5 amp 1 1/2" capacity in concrete	549	355

All above complete with cases

SKIL TOOLS

		List	Sale
551	5 1/2" Circ. saw 6.5A	99	73
77	7 1/4" Worm Saw	240	135
367	6 1/2" Worm Saw	239	135
825	8 1/4" Worm Saw	270	165
807	7 1/4" Skilsaw 13A-Super	153	100
808	8 1/4" Skilsaw 13A-Super	172	110
2016-02	3/8" Cordless Drill complete W/Charger, Case & 2 batteries	199	95

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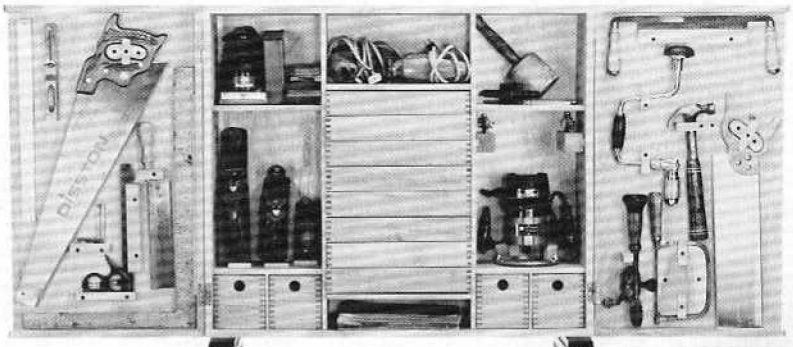

Toy Top
Sept/Oct '84

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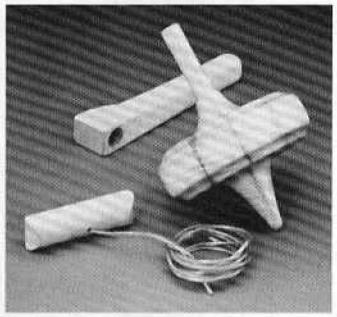
Tool Cabinet
Nov/Dec '84



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Vol. 7 No. 2 Mar-Apr '83: Porch Swing, Homemade Jig Saw, Cheval Mirror, Punched Tin Spice Cabinet, Television Stand, Nautical Table Lamp, Wooden Balance, Nesting Cube Tables, Steam Roller Toy, Back Massager, Mailbox, Wall Shelf, Chippendale Mirror, Clock Parts and Suppliers, *Articles:* Flat Miter Joints with the Table Saw and Router; Woodworking for Fun vs. Woodworking for Work; Applying a Clear Finish.

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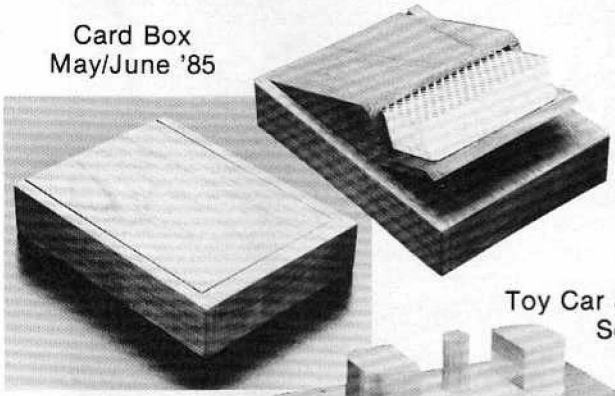
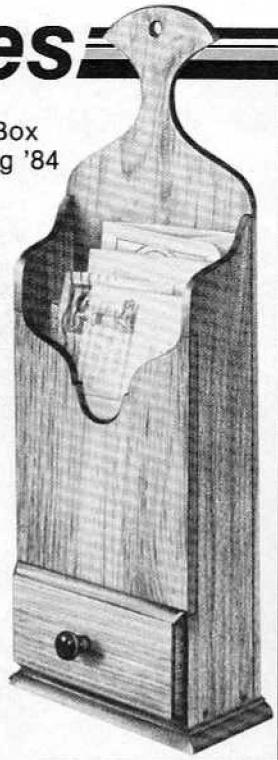


Card Box
May/June '85

Pipe Box
July/Aug '84



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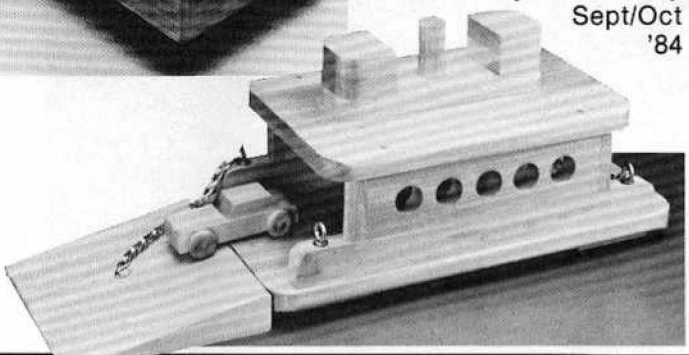
Sept/Oct
'84



Vol. 7 No. 6 Nov-Dec '83: Lighted Wall Planter, Roller Stand, Early American Wall Secretary, Dressing Screen, Wine Rack, Shaker Chest of Drawers, Waterbed, Toy Train, Mitten Box, Hooded Doll Cradle, Coal Scuttle, Elephant Push Toy, *Articles:* Basic Drawer Construction and Installation; Display Advertising; Some Repair Hints; Making a Raised Arch Panel.

Vol. 8 No. 1 Jan-Feb '84: Shaker End Table, Medicine Cabinet, Cassette Tape Rack, Captain's Clock, Stacking Storage Unit, Veneer Bracelets, Toy Car Carrier, Infant Bead Toy, French Bread Cutter, 19th Century Kitchen Clock, Early American Trestle Table & Benches, Table Saw Cut-Off Table, Coaster Set, General Woodworking Suppliers, *Articles:* Doweling Details; Sources of Information; Restoring Hopeless Cases; Mirror Image Panels.

Vol. 8 No. 2 Mar-Apr '84: Shaker Wall Clock, Compact Dry Bar, High Chair, Kitchen Canister Set, Colonial Water Bench, Stacking Desk Trays, Wooden Brooches, Toy Bulldozer, Rocking Horse, Contemporary Table, Wall Hung Telephone Cabinet, Pipe Smoker's Organizer, Clock Parts Suppliers, *Articles:* Edge-Joining Boards; More Sources of Information; More Hope for the Hopeless Cases; Making Cabriole Legs.

Vol. 8 No. 3 May-June '84: Country Vegetable Bin, Folding Deck Chair, Shaker Pedestal Table, Wall Hung Display Cabinets, Wooden Coat Hanger, Toy Car and Trailer, Paper Towel Holder, Carved Hand-Mirror, Writing Desk, Carved Walking Stick, Laminated Clock, Oak and Glass End Table, *Articles:* How to Lay Out and Make Circular Cuts; Mail Order Selling; Stripping Old Finishes; Carving the Ball-and-Claw Foot.

Vol. 8 No. 4 July-Aug '84: Wag-on-Wall Clock, Oak Swing, Candy Dispenser, Coffee and End Tables, Tugboat and Barge, Lazy Susan, Early American Mirror, Colonial Pipe Box, Sewing Machine Cabinet, Cam Clamp, Hamper, *Articles:* What Sells Best?; Homemade Removers; Buying a Basic Set of Hand Tools; Kerf Bending; Suppliers of Caning & Wood Finishing Products.

Vol. 8 No. 5 Sept-Oct '84: Contemporary Stereo Cabinet, Shaker Woodbox, Bongo Box, Nesting Tables, Shop Trammel, Jackknife Letter Opener, Salt Shaker and Pepper Mill, Toy River Ferry and Car, Toy Top, Cookbook Holder, Hall Table, Grandfather Clock: Part I, *Articles:* Starting a Business: Part I; Applying Filler; Building a Basic Workbench; Making Specialty Moldings with the Table Saw and Scratch Beader.

Vol. 8 No. 6 Nov-Dec '84: Stickley Chair, Tool Cabinet, Shaker Sewing Stand, Lighted Display Pedestal, Teardrop Clock, Pierced Tin Cabinet, Toy Hook and Ladder Fire Truck, Busy Bee Toy, Colonial Doll House, Kitchen Organizer, Wine Server, Grandfather Clock, Part II, *Articles:* Starting a Business Part II; Applying the Final Finish; The Fundamentals of Wood; Inlays and Inserts; Gustav Stickley and American Mission Furniture.

Vol. 9 No. 1 Jan-Feb '85: Early American Step Table, Oak Barrister's Bookcase, Parquet Table, Shaker Trestle Table, Bandsawn Wooden Scoops, Toy Biplane, Book Ends, Contemporary Candle Holders, Necktie and Belt Holder, Keyed Miter Jig, Modular Coffee Table and Bar, Magazine and Book Rack, Contemporary Chest of Drawers, *Articles:* Toys and Children's Articles: An Outline of The Consumer Product Safety Commission Standards; Shellac; Truing and Squaring Lumber; The Fingerjoint Spline; Suppliers of Furniture Kits; The Shakers; Special Section: Back Issue Index.

Vol. 9 No. 2 Mar-Apr '85: Queen Anne Lowboy, Television/VCR Stand, Early American Pine Corner Cupboard, Toy Tool Set, Windspinner, Woodchopper Whirligig, Chinese Puzzle, Cut-off Jig, Blanket Chest, Shaker Harvest Table, Blacksmith's Tool Tray, *Articles:* A Guide to Photographing Your Work; Applying Shellac and Lacquer; Sharpening Plane Blades and Chisels; Installing Machine Woven Cane; American Queen Anne, 1715-1755; General Woodworking Suppliers.

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

Vol. 9 No. 4 July-Aug '85: Gate-leg Table, Computer Desk, Shaving Horse, Stamp Dispenser, Crumb Collecting Breadboard, Toy Trucks, Early American Wall Shelf, Pivot-top Game/Coffee Table, Settle Bench, Shaker Single-Drawer Cupboard, Fold-up Workbench, *Articles:* Product Liability, Part II; Caning and Wood Finishing Supplies; Spray Finishing; Table Saw Basics; Making the Rule Joint; The William and Mary Period.

Vol. 9 No. 5 Sept-Oct '85: Colonial Schoolmaster's Desk, Contemporary Sideboard, Mahogany End Table, Victorian Hall Tree, Cutlery Wall Cabinet, Swing-out Plant Hanger, Prancing Horse Silhouette, Block Puzzle, Iron Caddy, Toy Ironing Board, Early American Water Bench, Wooden Smooth Plane, Shaker Sewing Box, *Articles:* A Craft Fair Visit; How to Use Stick Shellac; A Guide to Circular Saw Blades; Making Bent Laminations; Country Colonial Furniture.

Vol. 9 No. 6 Nov-Dec '85: Moravian Chair, Dulcimer, Oak Dining Table, Shaker Washstand, Marking Gauge, Veneered Wall Clock, 4 x 4 Off-Roader, Teddy Bear Puzzle, Duck Pull-toy, Landscape Cutting Boards, Early American Tall Clock, Pine Desk Organizer, *Articles:* Secrets of Success; Weaving a Fiber Rush Seat, Part I; Table Saw Ripping Problems and Their Solutions; 4-Piece Book Match Veneering; Pennsylvania Dutch Furniture.

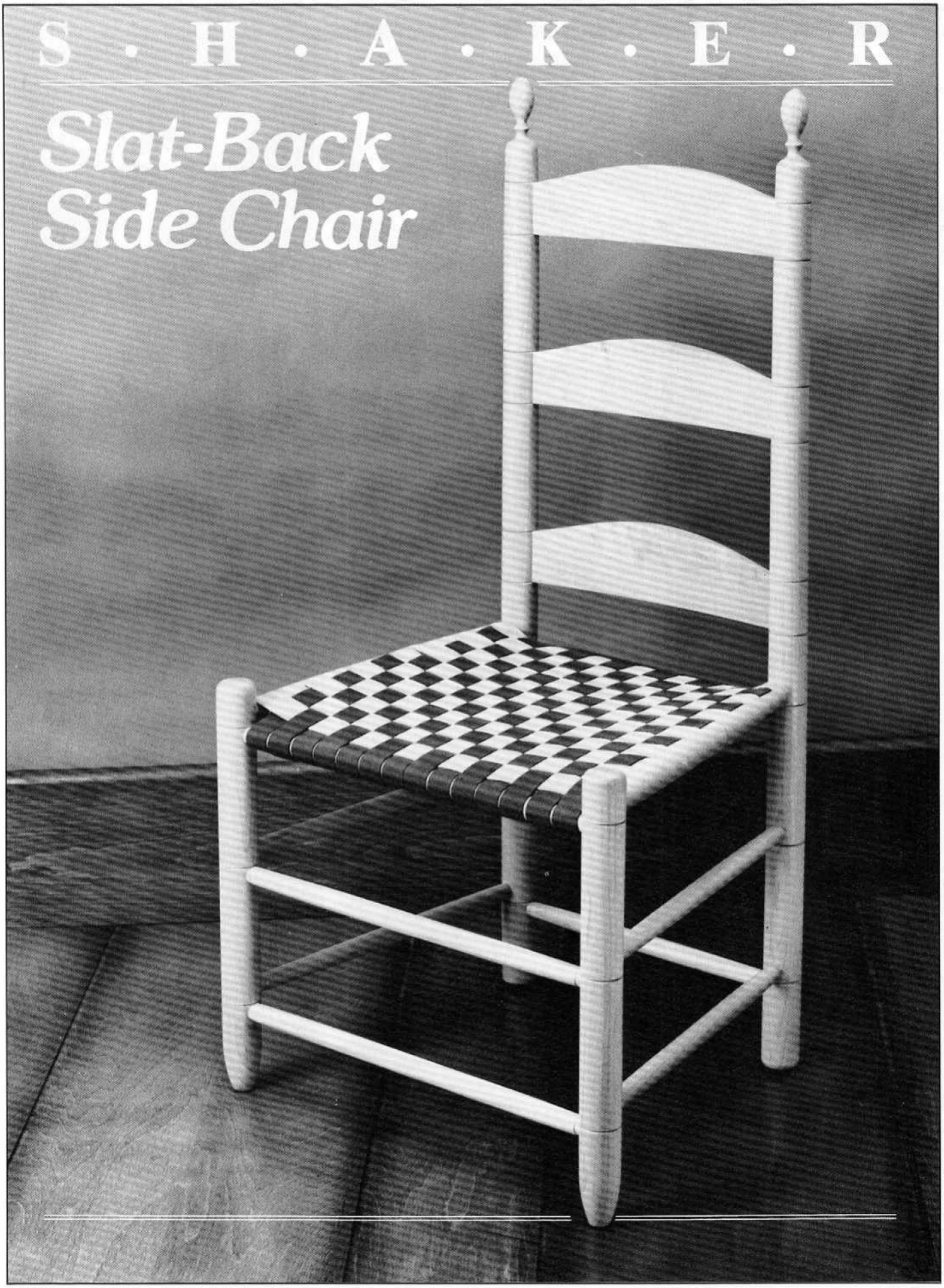
Vol. 10 No. 1 Jan-Feb '86: Freestanding Shelf System, Chippendale Bachelor's Chest, Oriental Serving Tray, Country Bench, Antique Knife Tray, Tape Dispenser, Valentine Box, Toy Tow Truck & Car, Shaker Drop-leaf Table, Shop-made Bow Saw, Child's Settle Bench, Plate Shelves, *Articles:* On Getting Paid for Your Work; Weaving a Fiber Rush Seat, Part II; Table Saw Crosscutting: Techniques & Tips; Router-Lathe Fluting: A Shop-made Approach; Chippendale Furniture.

Vol. 10 No. 2 Mar-Apr '86: Zebrawood Veneered End Table, Shaker Oval Box, Microwave Cart, Pin-Hole Puzzle, Tumbling Monkey Toy, Early American Wall Box, Kicking Donkey Whirligig, Shaker Side Table, Wooden Mallets, Federal Period Washstand, Connecticut Shelf Clock, *Articles:* A General Guide to Craft Fairs; Why Wood Warps; Cutting Tapers, Wedges and Other Irregular Shapes with the Table Saw; Unsupported or Hand Steam Bending; ⅜ in. Variable Speed Reversible Drills; Federal Period; Hardware Suppliers.

Vol. 10 No. 3 May-June '86: Victorian Whatnot Shelf, Contemporary Lamp, Early American Bench, Steam-bent Clock, Pine Hutch/Cupboard, Canada Goose Basket, Toy Crane, Condiment Holder, Shop Workstation, Parsons Table, Shaker Lap Desk, *Articles:* An Interview with Toymaker Clare Maginley; How to Flatten a Warped Board; A Guide for Choosing Your First Router; Supported Steam Bending; Victorian Period.

S · H · A · K · E · R

Slat-Back Side Chair



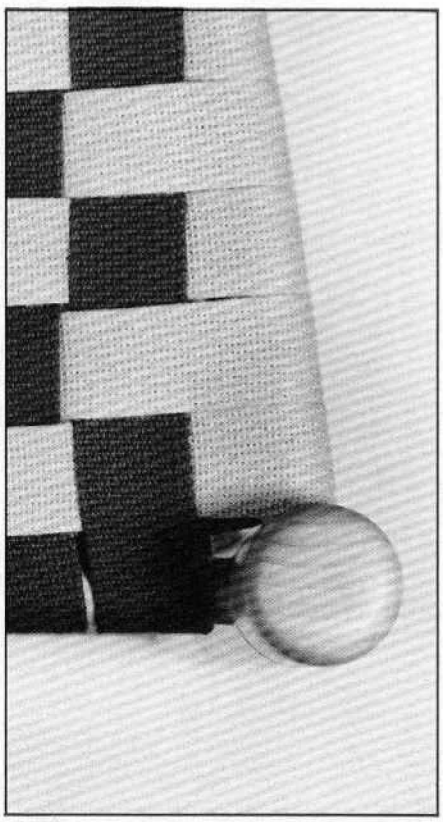
If there is one preeminent article of furniture for which the Shakers are known, it is their chairs. More chairs were produced for sale than any other furnishing, with the chairmaking enterprise at the New Lebanon, New York community stretching from a beginning in 1789 well into the 20th century.

The best known of all Shaker chairs were the so-called "slat-back", which were made in a variety of sizes starting in about 1830. The tall slat-back chairs, usually featuring three or more slats, were commonly called "ladder-back", while a low-back version with one or two slats served as a "dining chair".

The slat-back chairs featured steam-bent slats, finely tapered narrow rungs, and gradually tapered back legs often terminating in delicately pointed finials. Like much of the best Shaker work, the slat-back chair made maximum use, both structurally and aesthetically, of a minimum amount of wood. As we know, the Shakers deplored waste.

Although early Shaker chairs made use of a narrow hickory splint for the woven seat, most slat-backs featured the colorful worsted tapes that became popular after 1830.

The slat-back chair we show here is a reproduction of a New Lebanon chair made around 1830. Like the original, our chair is crafted in maple and has a worsted tape woven seat. Maple (sometimes tiger striped or curly) was the most common choice for primary wood, though ash and hickory were sometimes used for the rungs.



The only variations in our chair from the original are in the back slats and in the back leg height. We chose to form the curved slats from bent laminations rather than steam bending, since bent laminations provide a more consistent slat curve. Should you prefer to steam bend the slats, you may wish to refer to the March/April 1986 Special Techniques article on steam bending. The only other variation, the back height, was predicated on the need to fit the back leg turnings in a standard 36 in. lathe. The original back height (37¾ in.) could be achieved, if you prefer, by turning separate tenoned finials, and then attaching them to the previously turned back legs.

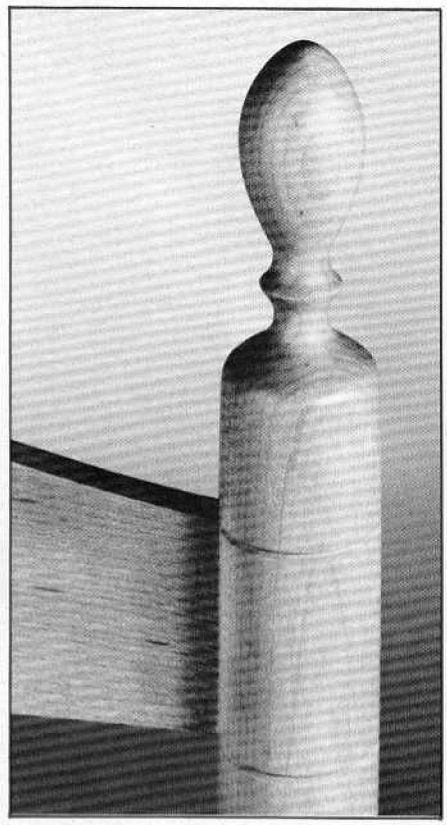
Overall, the chair is not difficult or complicated to build. Follow the instructions carefully, making certain that all measurements are precise, and that all joinery is as neat and clean as possible. No doubt the chair could be slam-banged together without careful attention to detail, but that would hardly be in the Shaker tradition, and the result would in all likelihood be nothing but a crude rendition of a chair that is recognized today as one of the true "American classics".

Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Front Leg	see Fig. 2	2
B	Back Leg	see Fig. 2	2
C	Top Front Rung	see Fig. 3	1
D	Top Side/Back Rung	see Fig. 3	3
E	Lower/Middle Front Rung	see Fig. 3	2
F	Lower Side/Back Rung	see Fig. 3	5
G	Slat	see Fig. 5	3

Note: This chair, having been built around 1830, is quite naturally sized to fit 1830 sized people, who on average were about four inches shorter than men and women today. Adding 10 percent to all dimensions will result in a chair more properly dimensioned for contemporary man.

Start by cutting 1¾ in. turning squares of maple for the front and back legs (A and B). Referring to the chair side view, lay out for the three mortises in each back leg that will accept the slat ends. These ⅜ in. by 2 in. by ⅞ in. deep mortises can either be made with the router, with the ends trimmed square by hand, or they can be chopped out entirely by hand using a chisel. After all these slat mortises are cut, fashion six pine filler blocks, one to friction fit within each mortise, as shown in Fig. 1A. As explained in Fig. 1B, these pine filler blocks are removed after the back legs have been turned.



Now turn the front and back legs to the profiles shown in Fig. 2. Rough turn with a gouge, then use the roundnose to round the legs and make the finial. Note that the back leg taper begins 14¾ in. from the bottom end. Use the skew to radius the ends, and last of all, use a spear point to cut the score lines shown in the side view. Such score lines are a common element on Shaker chairs, and in addition to their function as locator points, they provide an attractive detail. It is important that these score lines be precise and consistent because they help determine the various rung locations later on.

The rungs (parts C, D, E and F) are also turned now. Refer to Fig. 3 for overall rung length. Note that the top rungs (C and D) are ⅞ in. at the center, tapering to ⅝ in. at the ends, while the lower rungs (E and F) taper from ¾ in. to ⅝ in. The ⅞ in. tenon length of all the rungs is intended to allow for a

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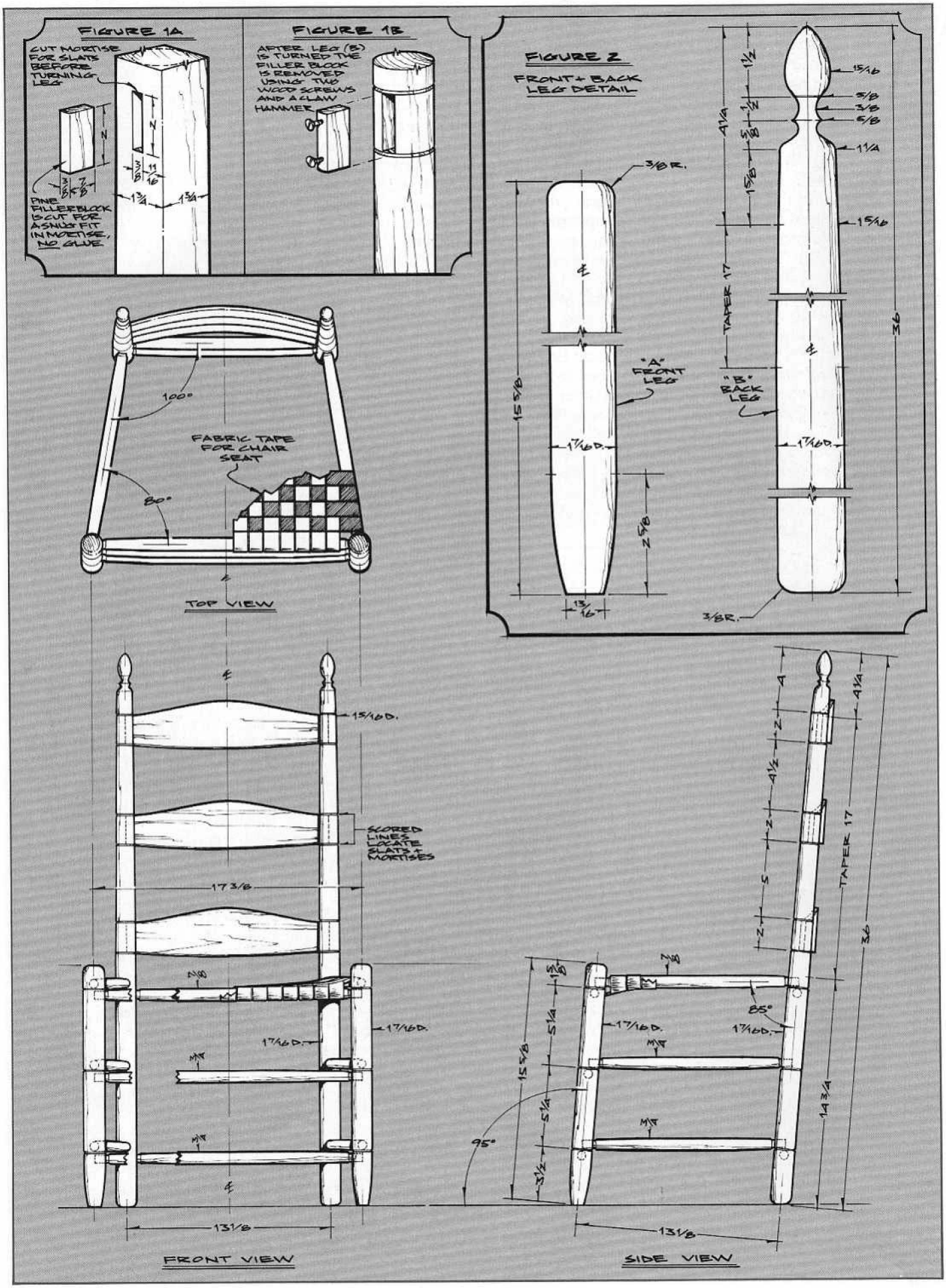
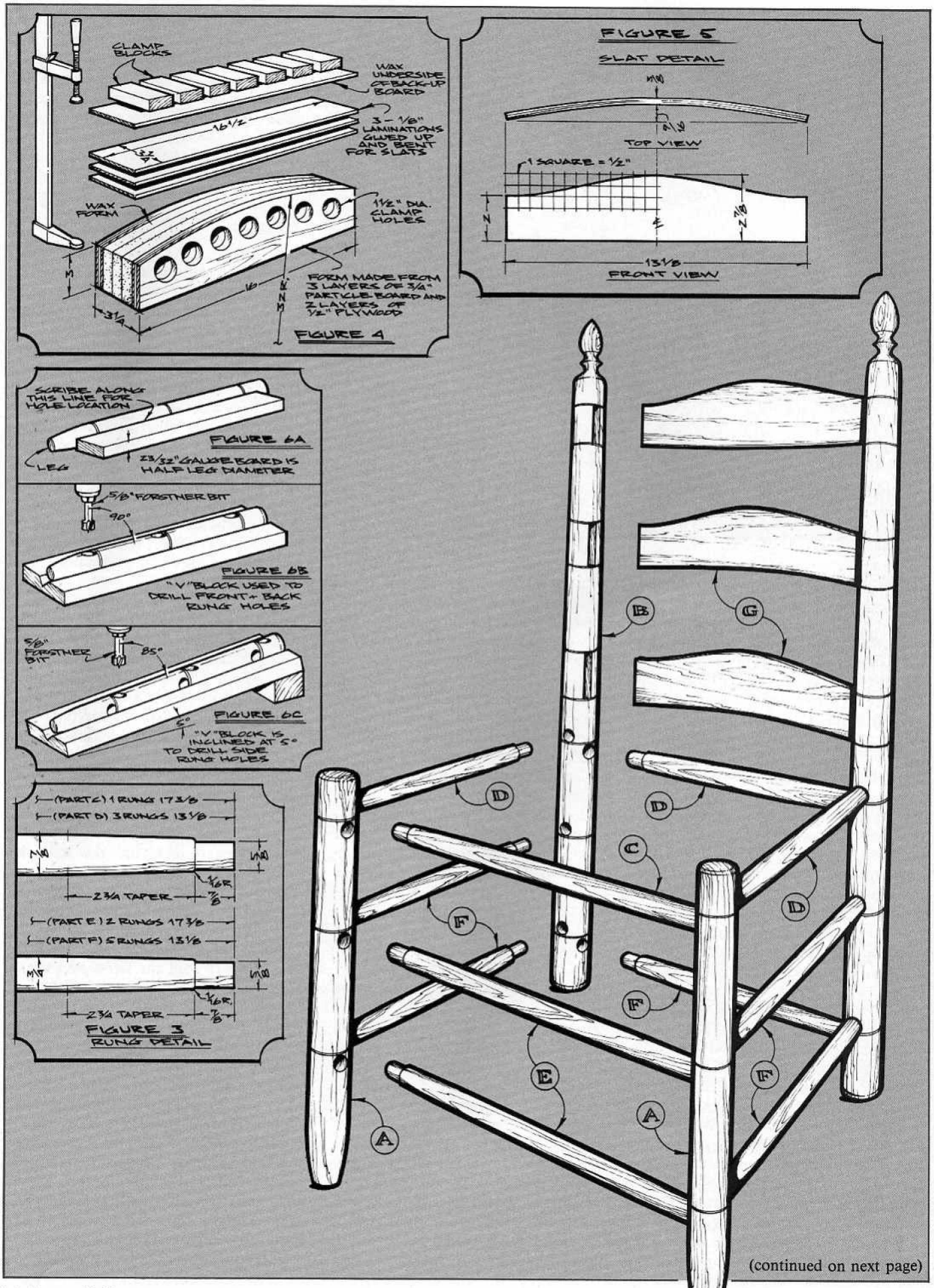


FIGURE 1A
CUT MORTISE FOR SLATS BEFORE TURNING LEG
PINE FILLER BLOCK IS CUT FOR A SNUG FIT IN MORTISE, NO GLUE
FIGURE 1B
AFTER LEG (B) IS TURNED THE FILLER BLOCK IS REMOVED USING TWO WOOD SCREWS AND A CLAW HAMMER
FIGURE 2
FRONT + BACK LEG DETAIL
3/8 R.
"A" FRONT LEG
"B" BACK LEG
TAPER 17
100°
FABRIC TAPE FOR CHAIR SEAT
80°
TOP VIEW
SCORED LINES LOCATE SLATS + MORTISES
FRONT VIEW
85°
95°
SIDE VIEW



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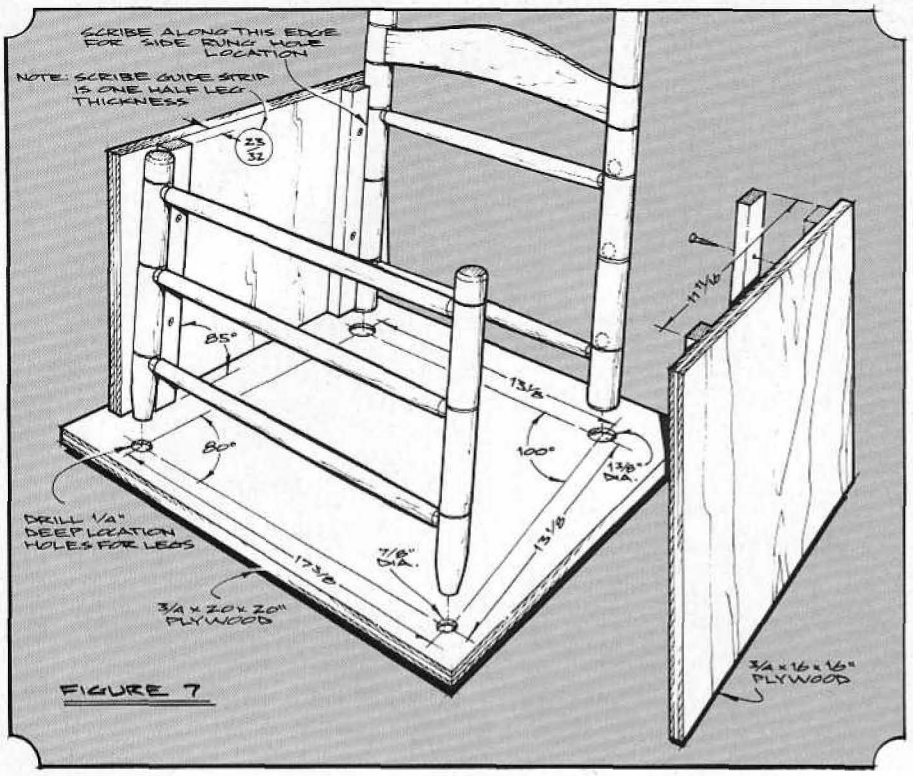

small length of the tenons to remain showing after assembly, a typical Shaker characteristic. *Tip:* Use a $\frac{5}{8}$ in. Forstner bit to drill through a piece of $\frac{1}{2}$ in. thick scrap, then cut in half to obtain a perfect size "gauge" that you can use to check the tenon diameter while turning. All final sanding of both the legs and rungs is done while in the lathe.

To make each of the three slats (G), resaw a 1 in. by $3\frac{1}{4}$ in. by $16\frac{1}{2}$ in. board, and surface to obtain three $\frac{1}{8}$ in. thick laminations. Note that these laminations should be kept in *consecutive order.* Now, referring to Fig. 4, construct a particleboard and plywood form that is $3\frac{1}{4}$ in. by 16 in. with a 32 in. radius arc. A 32 in. length of string tied to a pencil, with a nail as a centerpoint can be used to scribe the radius. Glue up the laminations with plastic resin glue, and use a backup board and clamp blocks to clamp the bent lamination securely around the form. Note the holes in the form to accept the clamps (the more clamps the better) and that both the form and backing board are waxed. When dry, lay out the slat profile shown in the Fig. 5 grid pattern, and bandsaw to shape. For more on bent laminations, refer to the September/October 1985 Special Techniques article.

Now cut a $1\frac{1}{2}$ in. wide board to exactly one half the maximum front and back leg thickness to use as a guide for scribing the rung mortise centerpoints. The same board is used for both the front and back legs, since the back leg diameter is consistent with the front legs over the lower $14\frac{3}{4}$ in. length. After scribing the centerline on the front legs (Fig. 6A), use a simple V-block on the drill press to drill the $\frac{5}{8}$ in. diameter by $\frac{23}{32}$ in. deep 90-degree holes in the front legs that accept parts C and E (Fig. 6B). Use the score lines for location, but locate the rung holes about $\frac{1}{16}$ in. below, so that later, when the angled rung holes are drilled, the front and side rungs do not intersect. To scribe the centerline on the back legs, first dry-assemble the back legs and slats. Lay the assembly flat and then use the $\frac{23}{32}$ in. thick scribe board to mark the back rung centerlines. Use the same V-block on the drill press to drill the $\frac{5}{8}$ in. diameter by $\frac{23}{32}$ in. deep, 90-degree rung mortises to accept the top back and lower back rungs (one each of D and F). *Drilling Tip:* To accurately locate the V-block, first chuck a small bit in the drill press and then lower it into the center of the V-block groove.

Next make the plywood fixture shown in Fig. 7, which is needed to obtain the centerline locations of the angled side rung holes. Drill four $\frac{1}{4}$ in. deep holes as illustrated in the bottom piece of plywood to locate the legs. Screw one of the four $\frac{23}{32}$ in. thick guide pieces to a side ply section at an 85 degree angle, then measure over exactly $11\frac{11}{16}$ in. (outside edge to outside edge) and screw the other guide piece in place at a parallel 85 degree angle. Repeat on the opposite side ply, then dry assemble the front and back assemblies, and temporarily clamp across the fixture with these assemblies in position as shown. Scribe the centerlines for the side rungs. The plywood fixture will accurately establish both the 5-degree slope of the side rungs relative to the legs and their 10-degree off-square front/back toe/splay (see top and side views).

Now construct a simple 5-degree incline using the previously made V-block. With the front legs' bottom ends toward the *lower* end of the angled V-block, drill the front leg side rung holes (Fig. 6C), and with the back legs' lower ends toward the *upper* part of the V-block, drill the back leg side rung holes (the *top* part of the back legs will extend some distance down and over the drill press table). Keep all the side rung holes consistent just above the V-groove score lines.

Dry assemble the entire chair and check for proper fit. While dry assembled, wax carefully around all the rung tenon shoulders and on the slats where glue might squeeze out. The wax will simplify clean-up later. Also label the rungs and slats, and pencil index all mortises and tenons while dry clamped to facilitate and speed the final assembly and glue-up, and to prevent confusion of parts.

Pre-assemble the front and back assemblies individually on a flat surface to insure that the legs remain parallel and on the same plane, and to prevent twisting during clamp-up. Glue, clamp, and let these assemblies dry.

Again on the flat surface, add the side rungs to join the front and back assemblies. Make certain that the four leg bottoms *all* contact the flat surface, so the chair will sit flat on the floor. For the finish, we wiped on three coats of tung oil.

Traditional worsted Shaker chair tape for the seat is available from: Shaker Workshops, P.O. 1028, Concord, MA 01742. The basic over/under weave is an easy process to master. Simply follow the manufacturer's instructions included with the worsted tape. *Taping Tip:* Since maple is so hard, pre-drill for the upholstery tacks. WWJ

Wall-Hung Display Cabinet

Fine collectibles require an attractive display area. This contemporary cabinet, in solid cherry, provides a dust-free environment with adjustable glass shelves.

Begin by cutting the ¾ in. thick sides (A) and end shelves (B). Next, select your largest straight cutter and use the router and edge-guide to cut the ½ in. by 1 in. rabbet in the shelves and sides that will accept the back. The shelf rabbets are full length, but the ends of the side rabbets must be squared by hand with a chisel. Now, referring to the Special Techniques article beginning on page 20, cut the ½ in. sliding dovetail joint that is used to join the sides and shelves (see sliding dovetail joint detail). Note that both the sliding dovetail and the groove are stopped ½ in. from the front edge of the cabinet carcase.

Make the ⅝ in. thick filler pieces (C), locate and drill the ¼ in. diameter by ½ in. deep shelf support pin holes, and cut off the top and bottom corners of the sides at a 30 degree angle as shown in the side view. Shelf support pins are available at most hardware stores. Cut the plywood back to size from ¼ in. thick cherry plywood, then dry assemble the carcase to check for proper fit. Keep the good side of the cherry ply facing front. If all is well, glue and assemble the carcase. Work quickly when sliding the dovetail shelves into the sides, lest the glue starts to swell the wood and the shelves bind part way in. Also, make the hanger (parts J), and glue the upper hanger piece to the plywood back, as shown in the hanger detail.

To construct the cherry doors, first miter the ends of parts D and E to establish their length. Next, with a ¼ in. straight bit in the router table raised to a 1⅜ in. height, and with a stop and the fence in place to assure a ⅞ in.

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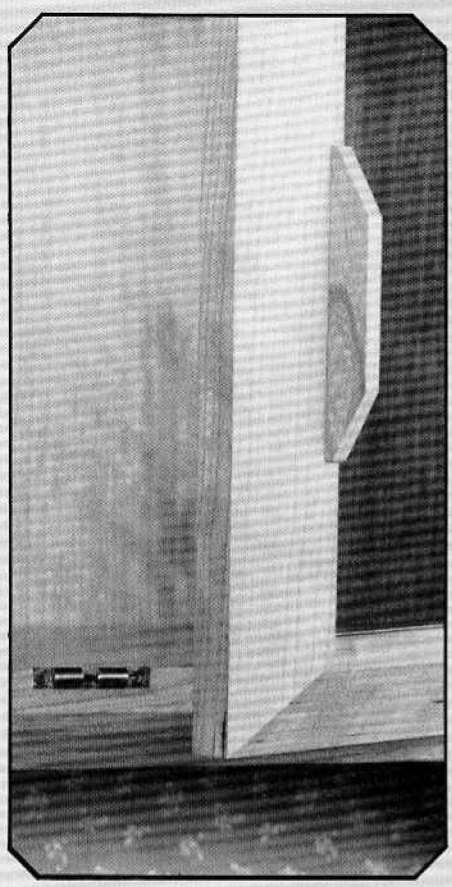


spline groove depth located 3/16 in. from the inside edge, cut the spline grooves. As you will note from the spline groove cutting detail, the groove end will be round. You may either square the groove using a 1/4 in. chisel, or leave it round and size the spline smaller. In any event, the splines (also cherry) should always be a hair smaller than the groove dimensions so the miters are not accidentally held apart.

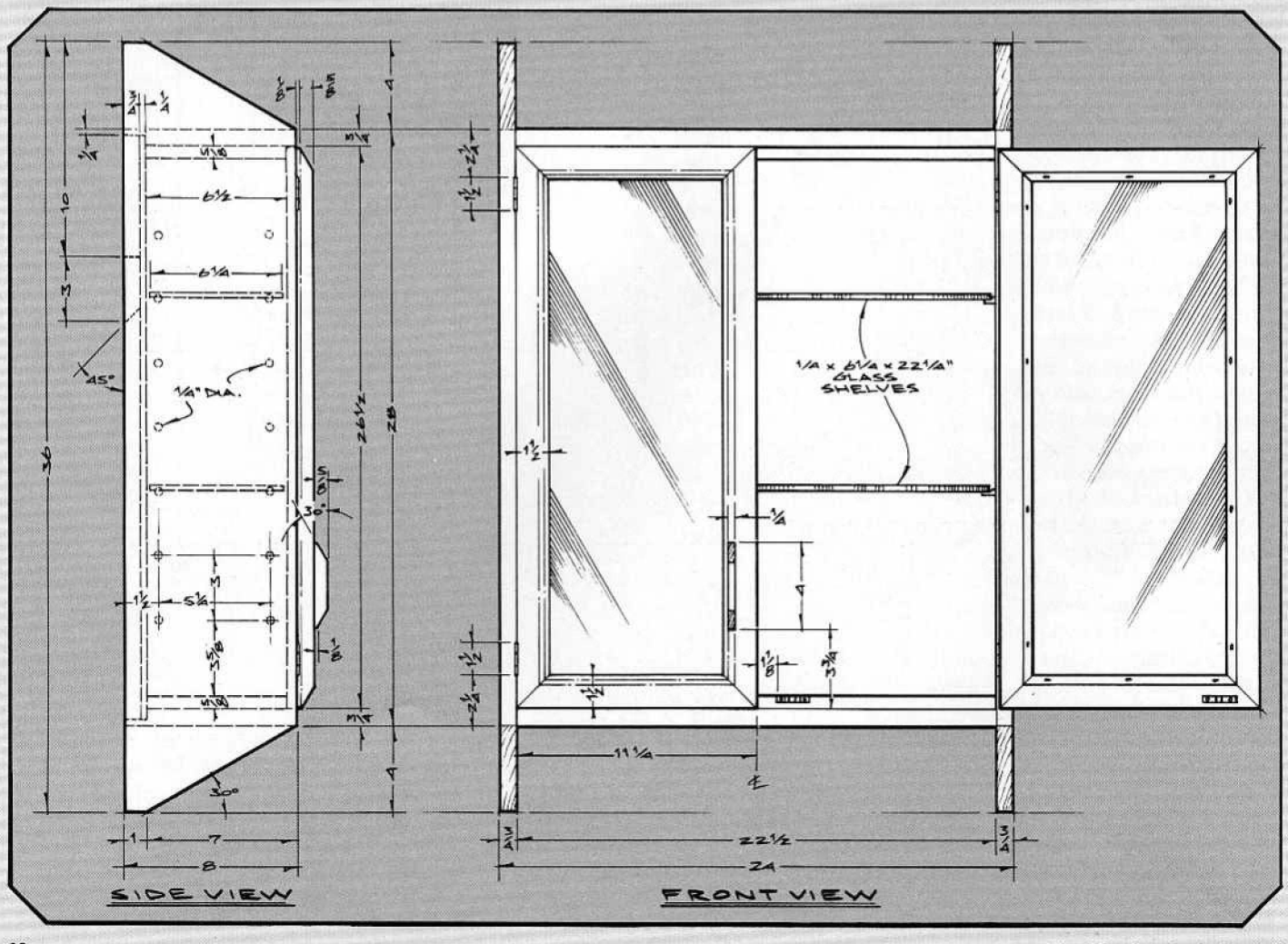
After all the spline grooves have been cut, parts D and E are rabbeted 3/8 in. by 7/8 in. to accept the door glass, and a 30 degree bevel is cut along the front edge as shown in the door "section". After cutting the door glass retainer (H), assemble the doors. Both the door glass (G) and the glass shelves (N) can be cut to fit at your local glass shop. Note that the retainer (H) is screwed, but not glued, in place to facilitate glass replacement if necessary. Make the door pulls (F) as shown, and glue in place.

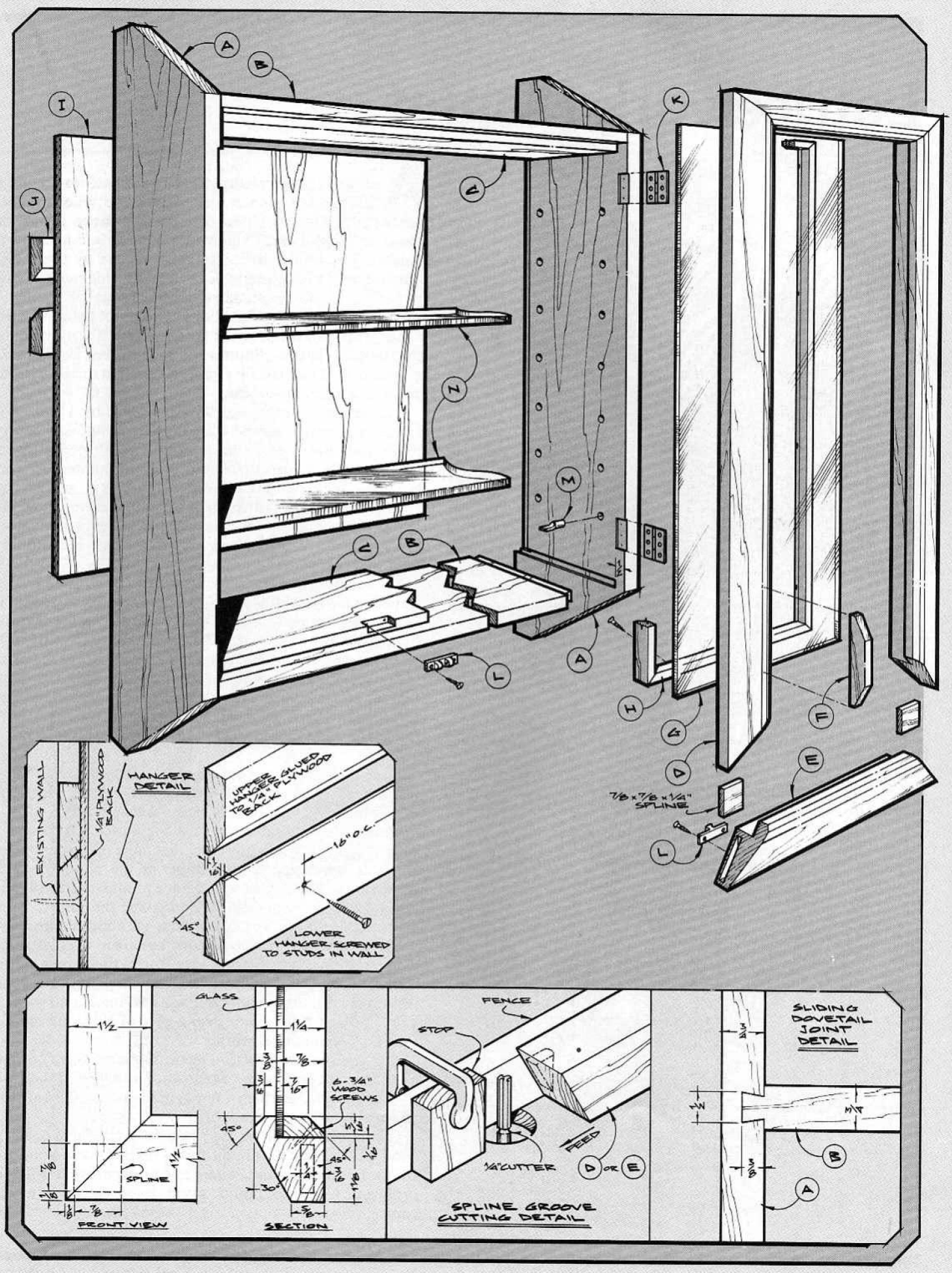
Mortise for the hinges (K) and, after hanging the doors, mortise for and install the double ball catches (L). The solid brass hinges (part number 2455B) and double ball catches (part number 2554B) are available from: Mason & Sullivan Co., 586 Higgins Crowell Road, West Yarmouth, Cape Cod, MA 02673.

To finish, we sprayed on two coats of Deft Semi-Gloss Clear Wood Finish. Note that the doors and cabinet must, of course, be finished before the door glass and shelves are installed. WWJ

Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Side	3/4 × 8 × 36	2
B	End Shelf	3/4 × 8 × 23 1/4	2
C	End Shelf Filler	5/8 × 6 1/2 × 22 1/2	2
D	Door Stile	1 1/4 × 1 1/2 × 26 1/2	4
E	Door Rail	1 1/4 × 1 1/2 × 11 1/4	4
F	Door Pull	1/4 × 5/8 × 4	2
G	Door Glass	1/8 × 9 × 24 1/4	2
H	Door Glass Retainer	3/8 × 3/4	8
I	Back	1/4 × 23 1/2 × 27 1/2	1
J	Hanger	3/4 × 3 × 23 1/2	2
K	Hinges	1 1/2 × 1	2 pair
L	Double Ball Catch	5/16 × 1 1/16	2
M	Shelf Support Pin		8
N	Glass Shelf	1/4 × 6 1/4 × 22 1/4	2




A
B
I
J
K
C
N
M
L
H
G
F
D
E
7/8 x 7/8 x 1/4" SPLINE
HANGER DETAIL
EXISTING WALL
1/4" PLYWOOD BACK
UPPER HANGER GLUED TO 1/4" PLYWOOD BACK
16" O.C.
45°
LOWER HANGER SCREWED TO STUDS IN WALL
GLASS
1 1/2
1 1/4
3/8
7/8
7/16
6 - 3/4" WOOD SCREWS
45°
1/4
11/16
30°
5/8
1 1/4
7/8
1/8
SPLINE
FRONT VIEW
SECTION
FENCE
STOP
FEED
1/4" CUTTER
D OR E
SPLINE GROOVE CUTTING DETAIL
SLIDING DOVETAIL JOINT DETAIL
3/4
1 1/2
1 1/2
3/8
B
A

Latticework Planter

As a well chosen picture frame compliments a painting, an attractive planter can effectively display a favorite houseplant. Ours is a low-cost, easy-to-make design that looks as good in the living room as it does outside in the garden. The planter measures 12 in. square by 12 in. high, dimensions we found suitable for a fairly wide range of plant pots, but it can be made somewhat larger or smaller, if necessary. Check the dimensions of your pot before starting.

Since our pot is rather tall (about 9 in.), it simply rests on the bottom lattice. Shorter pots, however, will need a plywood shelf (see Detail: Optional Shelf) in order to be raised to an acceptable height.

The lattice is made up of ¼ in. thick by 1½ in. wide crisscrossed strips spaced 2¾ in. apart. Although you can make your own, we found it much easier to purchase the commercially made lattice sold at many lumberyards and building supply centers. It's sold in 4 ft. by 8 ft. and 2 ft. by 8 ft. sheets, with the lattice strips stapled and glued together. It's generally available in pine or cedar, either planed smooth or roughsawn. If you plan to keep it outside, cedar would be your best choice.

Five-quarter stock (which measures 1⅛ in. thick) can be ripped to 1⅛ in. widths to get the square stock needed for the four upper frames (A), four legs (B), and four lower frames (C). The ½ in. wide by ¼ in. deep groove can be cut with a dado head or by making repeated passes with the regular saw blade. Note that the upper frames have a single groove while the legs and lower frames have a pair of grooves. Before cutting the grooves, it's a good idea to measure the actual lattice thickness and, if necessary, adjust the groove width as needed.

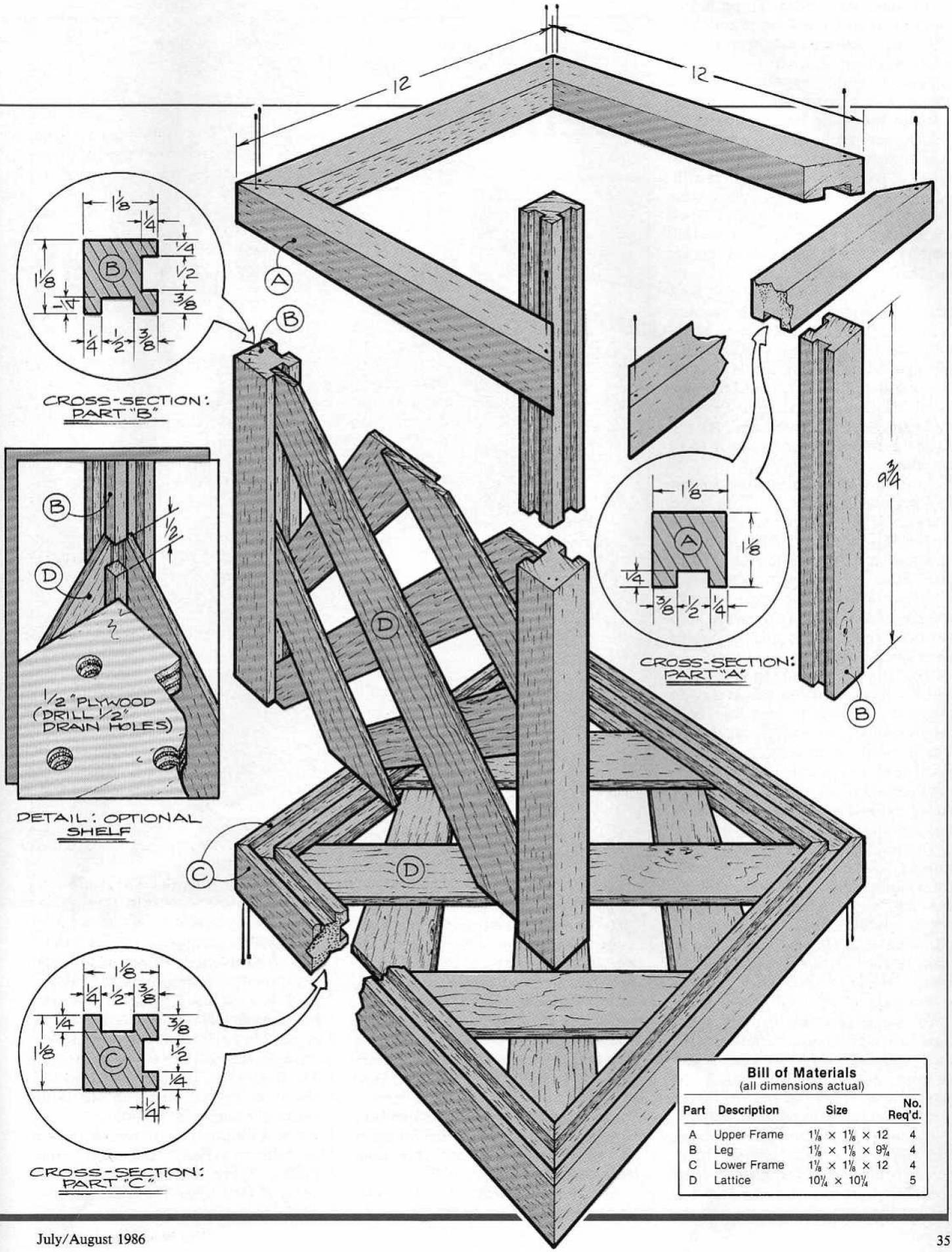
Once the grooves are cut, the 12 in. long upper and lower frames can be mitered on each end. The legs, which have square cut ends, can then be cut to a length of 9¾ in.

Next, using the table saw, cut the lattice (D) to 10¼ in. square. Keep in mind, however, that most of the commercial lattice is assembled with a staple at the point the lattice crisscrosses. This means you'll have to make sure you don't hit one with the saw blade when making the cut.

Assemble the parts as shown using glue and clamps. If you intend to use the planter outdoors, be sure to use plastic resin glue. Available at most hardware stores, this brown powder is mixed with water to create a glue with excellent moisture resistance. White or yellow glue will not stand up to water for any length of time. Once dry, a pair of finishing nails are driven at each mitered corner.

If a shelf is needed (see Detail: Optional Shelf) a notch must be cut at each corner as shown. The plywood shelf is cut to fit in the notches, then a few ½ in. diameter holes are drilled to allow water to drain off.

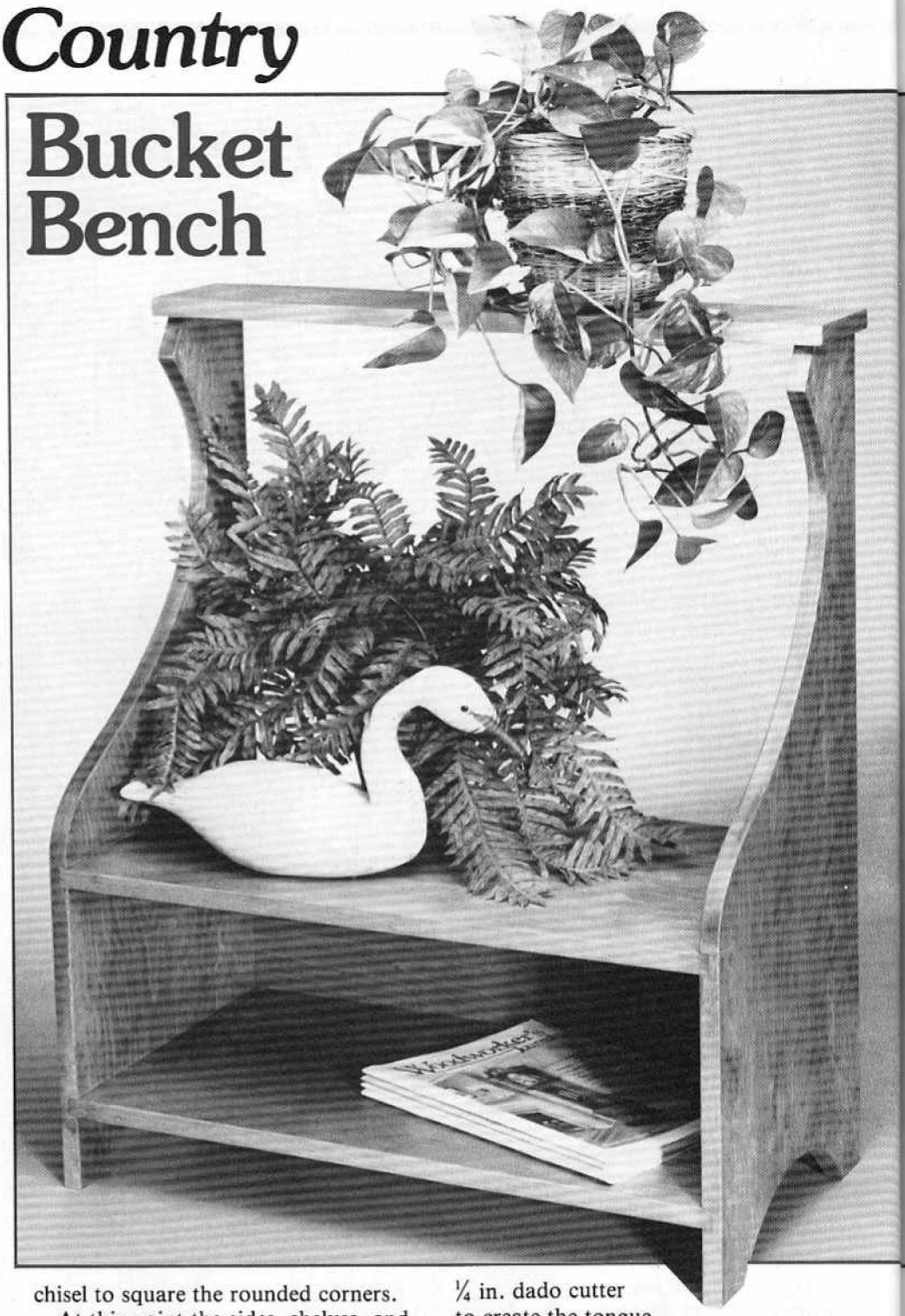
If your planter will be used indoors, a couple of coats of a good penetrating oil are all that's needed for a good final finish. For outdoor use, where rain or exposure to water is a problem, Cuprinol brand wood preservative is a good choice. WwJ



Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Upper Frame	1⅛ × 1⅛ × 12	4
B	Leg	1⅛ × 1⅛ × 9¾	4
C	Lower Frame	1⅛ × 1⅛ × 12	4
D	Lattice	10¼ × 10¼	5

Country Bucket Bench



Early Americans didn't have the luxury of simply turning a tap when water was needed. To get it, one had to hike to the well or, if a well did not exist, to a nearby stream or lake. As might be expected, it was a chore often assigned to one of the youngsters in the family, and it meant hauling the water back to the house in several buckets. The bucket bench, or water bench as it was sometimes called, was found in many of those early houses and provided a convenient means of storing those buckets of precious water. Ours is based on a design that dates back to the 18th century and, like many early bucket benches, it is made of pine.

Begin by edge-gluing enough 1 by 8 pine stock (which will actually measure ¾ in. thick by 7¼ in. wide) to make the two sides (A) and the two shelves (B). It's a good idea to allow a little extra on the length so that later, after the glue has dried, the stock can be trimmed to the exact length dimensions. At the same time the stock can be ripped to 14 in. wide.

Next, lay out and mark the location of the two ¾ in. wide by ⅜ in. deep dadoes cut in each side to accept the shelves. Equip the table saw with a ¾ in. wide dado cutter set to make a ⅜ in. deep cut, then using the miter gauge, pass the stock over the cutter to make the dadoes as shown. Take care to hold the stock down firmly and be sure to keep hands away from the cutter.

Since the ¾ in. dado cutter is set to make a ⅜ in. deep cut, this is a good time to cut the ¾ in. wide by ⅜ in. deep rabbet on the back edge of each shelf. You'll need to attach an auxiliary wood fence to the regular rip fence for this operation, because the dado cutter must just touch the rip fence in order to make a ¾ in. wide cut.

To accept the two backs (D), a ¾ in. wide by ½ in. deep by 8¾ in. long rabbet is cut in the back edge of each side. We used a router equipped with an edge-guide and a ½ in. diameter router bit to make these cuts. You'll need to make several passes to complete the rabbet. Square the rounded corners with a sharp chisel.

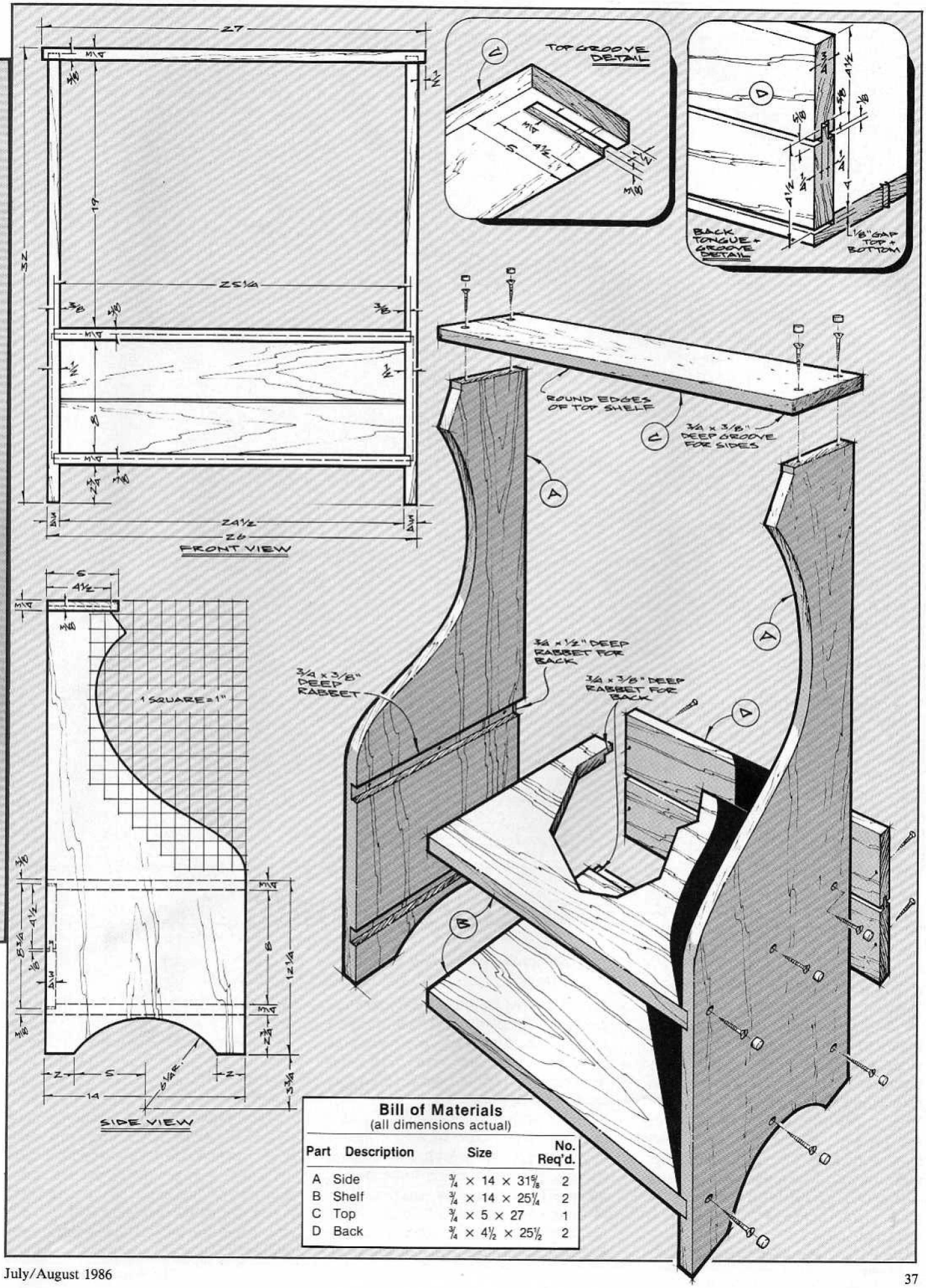
To complete work on the sides, transfer the grid pattern (shown in the side view) to the stock, then use a band or saber saw to cut just outside the marked line. Use a file and sandpaper to smooth exactly to the line.

The top (C) can now be cut to length and width as shown. Use the edge-guided router to cut the ¾ in. wide by ⅜ in. deep grooves to accept the top ends of the sides. Once again, use the chisel to square the rounded corners.

At this point the sides, shelves, and top can be assembled. Final sand all parts, starting with 80 grit, then follow with 120, 150, and 220. However, if the surface is reasonably smooth before you start, you'll probably be able to skip the 80 grit step. Once sanded, apply glue to the mating surfaces, then assemble with flathead wood screws, counterbored and plugged as shown. Counterbore the holes so that the plugs sit just above the surface, then sand each one flush.

The two backs can now be made. Cut to length and width before using a ¼ in. dado cutter to create the tongue and groove edges. Final sand each board before assembly. Note that the back boards are secured to the rabbeted back edge of the sides with a single flathead wood screw driven through the centerpoint of each end. The single screw on each end allows the board to expand and contract with seasonal changes in humidity.

For a final finish we used two coats of Minwax's Early American Wood Finish. When thoroughly dry, two coats of Deft Clear Wood Finish were added to complete the project. WWJ



Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Side	¾ × 14 × 31⅝	2
B	Shelf	¾ × 14 × 25¼	2
C	Top	¾ × 5 × 27	1
D	Back	¾ × 4½ × 25½	2

Adirondack Chair

Built by Brent and Gunnar Kallstrom

When we first saw this rustic Adirondack pine chair we were intrigued with the idea, but we also had some doubts. With the steeply angled back and long curved seat both slatted, how comfortable could the chair be? Well, much to our surprise, it is very comfortable. As a lawn or patio chair, it is something like a chaise lounge, allowing you to stretch out and relax. The wide arms are ideal for that paper plate picnic lunch and a tall glass of lemonade.

Best of all, the chair is easy to make. Except for the back slats (I), which are cut from wider stock on the table saw using a tapering jig, all the remaining parts are made from ¾ in. thick common pine boards, and should therefore require no ripping.

Start with the two seat frame members (A). After applying the 18 degree taper to the back bottom, transfer the grid pattern illustrated in the auxiliary side view, and band or saber saw the seat curve. Notch for the lower back frame (G) and radius the back corner as shown. Cut the front legs (B) to length, and then the back legs (C), using the table saw to establish the 57 degree miter on the top end of the back legs. Cut the two stretchers (D and E) to length, and make the eleven seat slats (F).

Now make the back frames (G and H), as shown in the auxiliary top view. Use a pencil tied to a string anchored by a nail to mark the respective radii. For part G, the length of the string between the pencil and nail will be 15½ in., while for part H the string length will be 23 in.

The seven back slats (I) are all cut on the table saw, using a simple tapering jig (described in The Beginning Woodworker column in March/April 1986). All should be cut to the same initial dimensions (2¾ in. wide tapering to 2 in. and 32 in. long). Then butt the back slats together and scribe a 21 in. radius across the top. Secure the slats with clamps and a cleat (to prevent chattering) and cut the 21 in. radius with a saber saw.

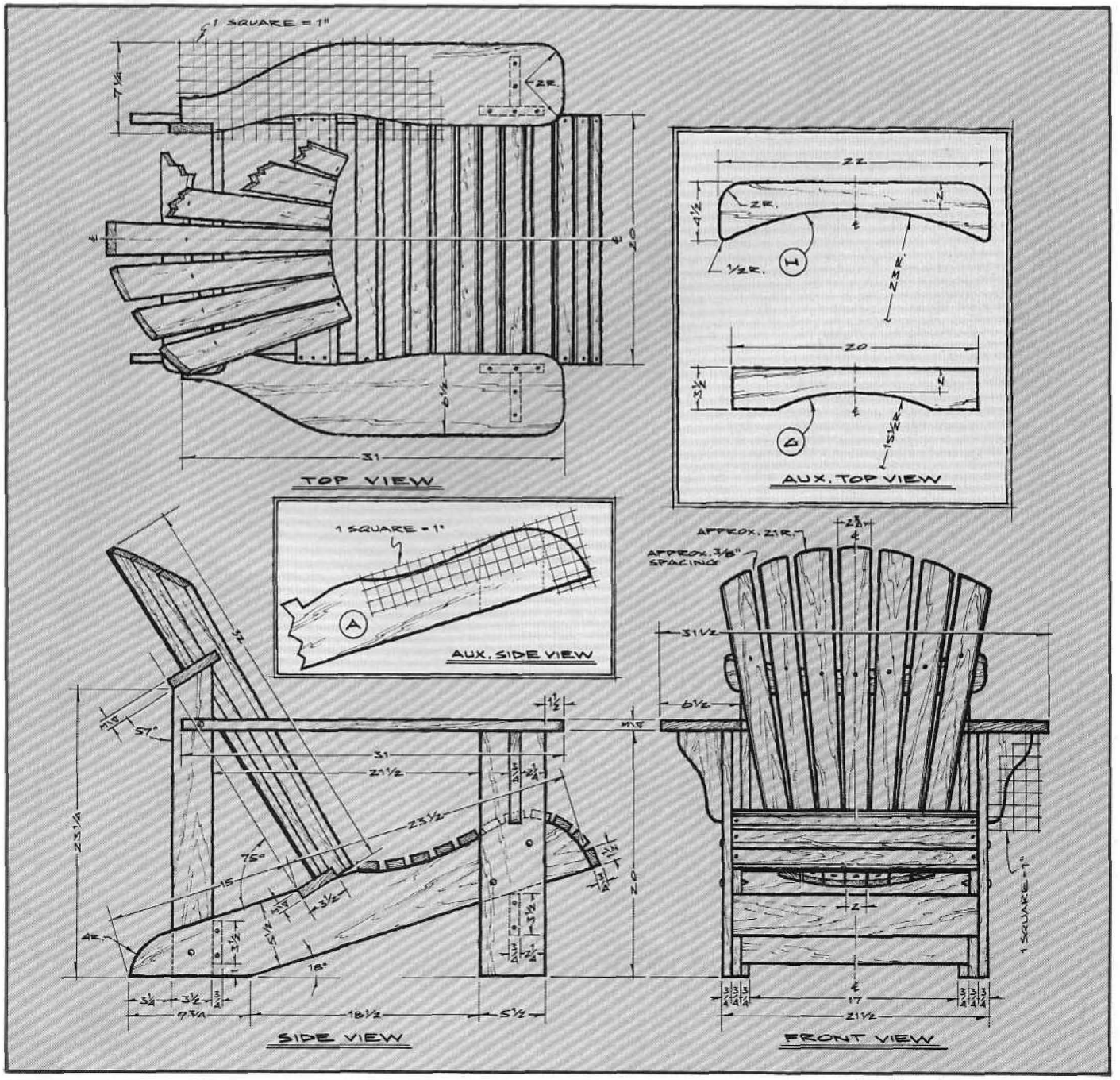
Make the arms (J), laying out their shape from the top view grid pattern, and cut to shape with the band or saber saw. Notch the arms to accept the back legs, and lay out and shape the two arm braces (K) as illustrated in the front view grid pattern.

Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Seat Frame	¾ × 5½ × 38½	2
B	Front Leg	¾ × 5½ × 20	2
C	Back Leg	¾ × 3½ × 25½	2
D	Back Stretcher	¾ × 3½ × 18½	1
E	Front Stretcher	¾ × 3½ × 20	1
F	Seat Slat	¾ × 1½ × 20	11
G	Back Frame (lower)	¾ × 3½ × 20	1
H	Back Frame (upper)	¾ × 4½ × 22	1
I	Back Slat	as shown	7
J	Arm	¾ × 7¼ × 31	2
K	Brace	¾ × 3½ × 7½	2

The chair is assembled with plastic resin glue (white or yellow glue won't stand up to regular exposure to water), 2 in. drywall screws, and plated carriage bolts as shown in the exploded view. When laying out the back slats, note that their spacing is about ⅜ in. at the top, tapering to less than ⅛ in. at the bottom. Chamfer any sharp edges, and sand corners and ends as needed to prevent splintering.

We finished our chair with Cuprinol brand wood preservative. Cuprinol will help the wood retain its natural rustic look, while preventing rot and decay. A reapplication of the Cuprinol once a year will insure years of trouble-free outdoor use from this chair. WWJ



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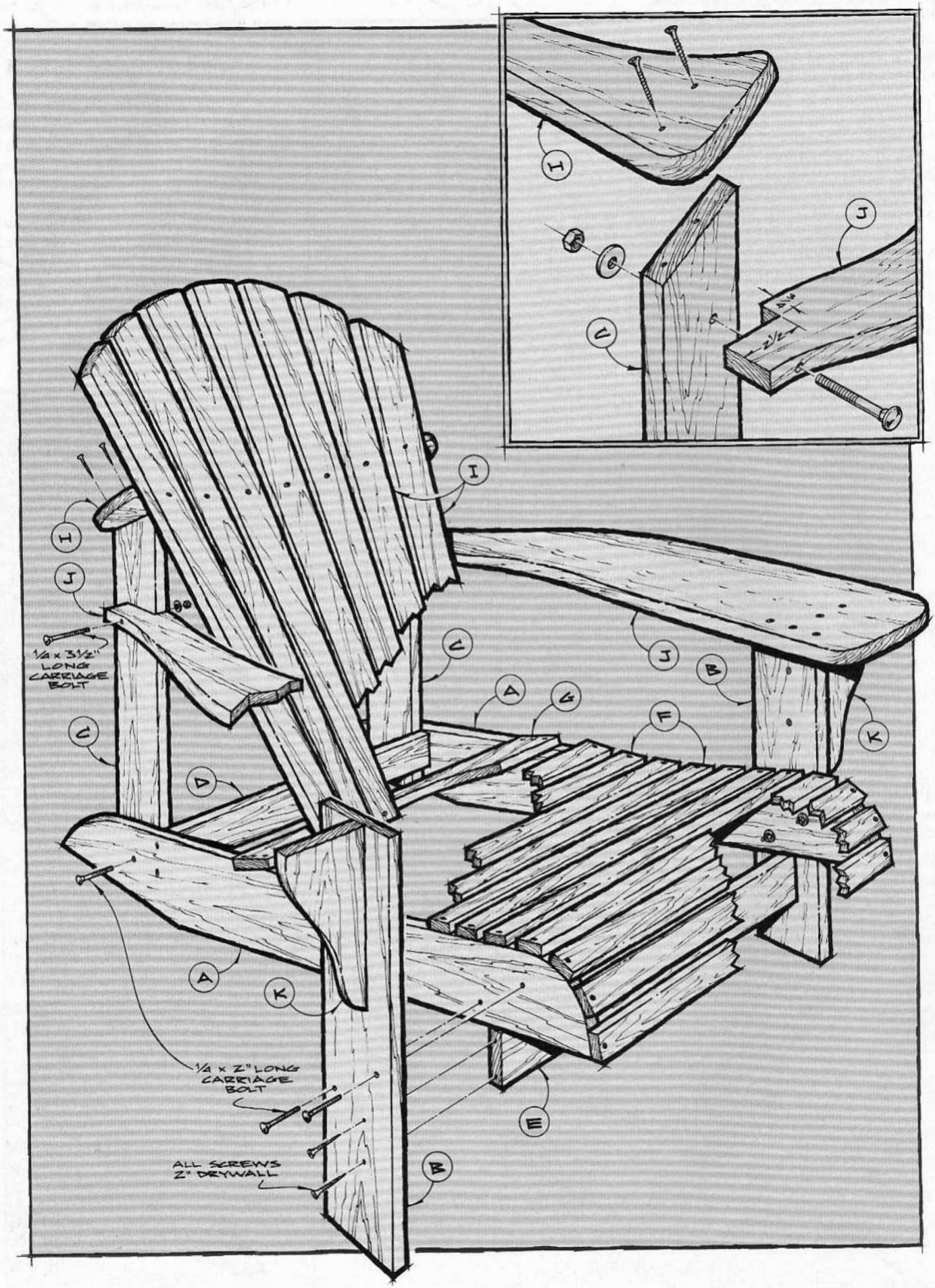

I
J
C
2½"
¼"
H
J
¼ x 3½" LONG CARRIAGE BOLT
C
D
A
K
¼ x 2" LONG CARRIAGE BOLT
ALL SCREWS 2" DRYWALL
I
C
A
G
F
J
B
K
E
B

The Gift Shop • Easy-To-Make Gift Projects

Connoisseurs tell us that a really great cup of coffee starts with freshly ground beans. Our project, made from maple, is a reproduction of an antique hand-cranked coffee mill, one that doesn't just look good, but also works quite effectively.

The mill mechanism (I) is available from Woodcraft Supply Corporation, 41 Atlantic Avenue, Woburn, MA 01888 (part number 07V41-KR, current price $14.95 postpaid). An adjustment knob at the top allows the size of the grounds to be varied from very fine to coarse. When the coffee is ground to the right size, we found it works very nicely in all coffee makers, including the drip type that most everybody seems to have these days.

You'll need ½ in. thick stock to make the four sides (A). If you don't have a thickness planer and can't get ½ in. thick stock locally, check with a lumberyard or millwork shop as they will often plane thicker stock for a nominal charge.

After thickness planing, cut the stock to a width of 4½ in. and a length of 5¼ in. Make sure all cuts are square. The box joints (also called finger joints) can be cut individually, either by using the dado head cutter or by making repeated passes with the regular saw blade. These joints can also be cut using a box joint jig on the table saw. This easy-to-make jig was described in The Beginning Woodworker column in our November/December 1982 issue.

Dry assemble the four sides and check for proper fit-up of the joints. If satisfied, apply a thin coat of glue to all the mating surfaces, then assemble and clamp firmly.

When dry, remove the clamps, then use the table saw to cut the ½ in. by 1½ in. notch on the front to accept the

Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Side	½ × 4½ × 5¼	4
B	Base	¾ × 6½ × 6½	1
C	Cover Strip	½ × ⅝ × 4¼	4
D	Drawer Front	½ × 1½ × 5¼	1
E	Drawer End	¼ × 1½ × 4	2
F	Drawer Side	¼ × 1½ × 4¼	2
G	Drawer Bottom	⅛ × 4 × 4	1
H	Drawer Knob	¾ diameter	1
I	Mill	6 × 6	1

drawer front (D). To make the notch you'll need to make two passes, the first one with the blade set to a height of 1½ in., the second — at right angles to the first — with the blade set to a height of ½ in.

The base (B) can now be made. Cut ¾ in. thick stock to 6½ in. square, then use the router table with a ¼ in. Roman ogee bit to shape the molding all around (see Side View: Base). Center the four-sided box on the base then join the two members by driving four 1¼ in. long by no. 6 flathead woodscrews up through the base and into the bottom edges of the box.

You'll need to resaw thicker stock to get the ¼ in. material needed for the drawer ends (E) and sides (F). The ⅛ in. deep by ¼ in. wide rabbet on each end can be cut by setting the table saw blade to a depth of ⅛ in. and using the miter gauge to pass the stock over the blade. Two or three passes will be needed to get the ¼ in. width. To cut the ⅛ in. wide by ⅛ in. deep groove for the drawer bottom (G), locate the rip fence ⅛ in. from the sawtooth and, with the blade still set to a height of ⅛ in., pass the stock over the blade. To keep hands a safe distance from the blade, be sure to use a push stick.

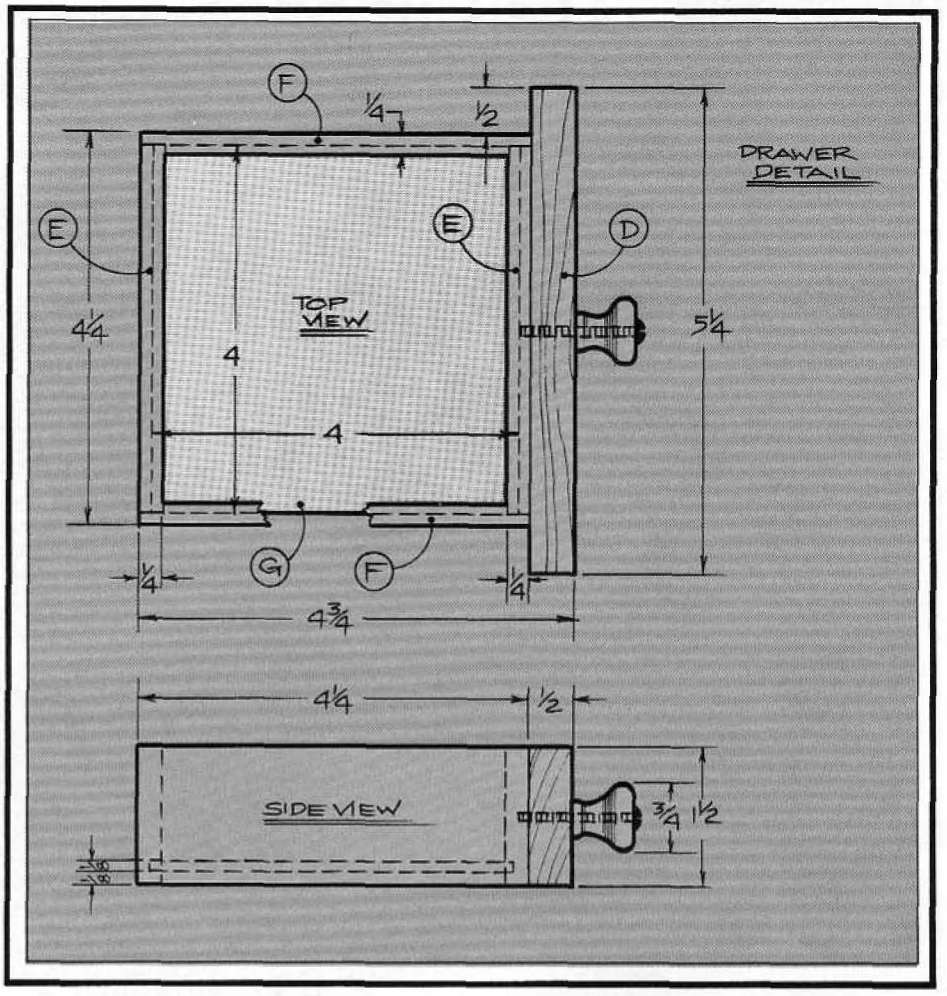
After cutting the drawer bottom to size from ⅛ in. thick hardboard (Masonite), the drawer ends, sides and the drawer bottom can be assembled. Use glue and clamp firmly. When dry, remove the clamps and drill pilot holes at each rabbet joint for ½ in. long brads.

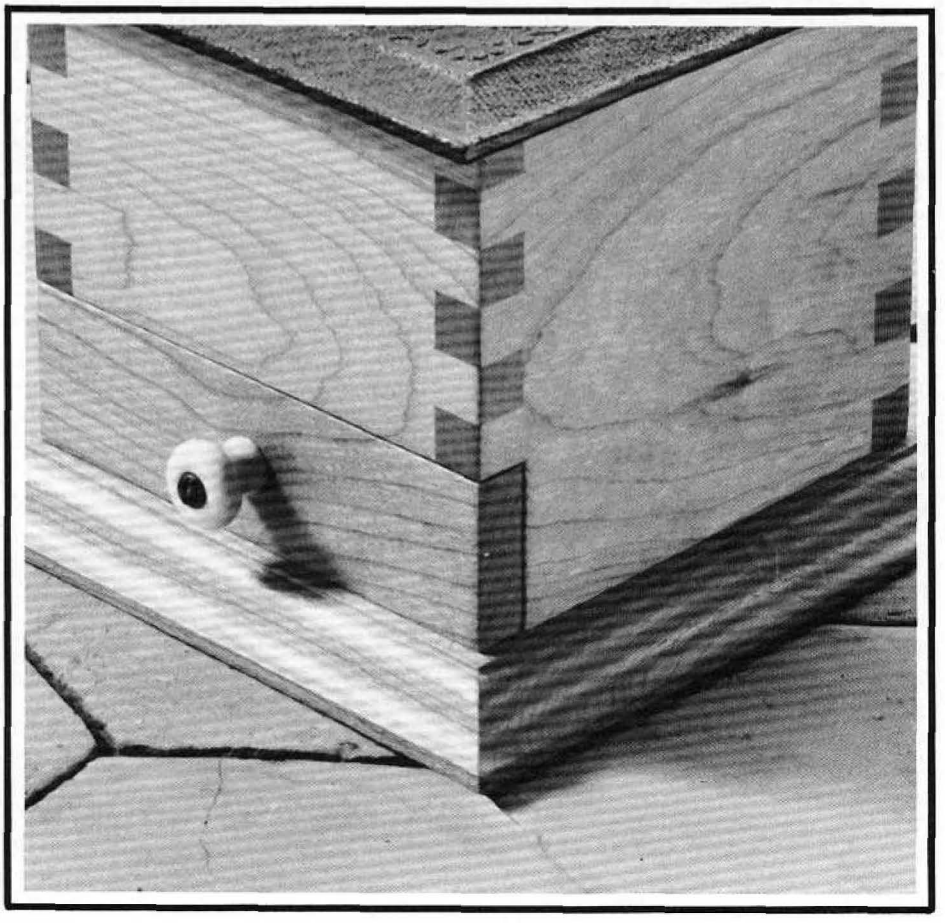
Cut the drawer front to fit the opening created by the notch that was previously cut in the front of the box, then glue and clamp it to the front drawer end.

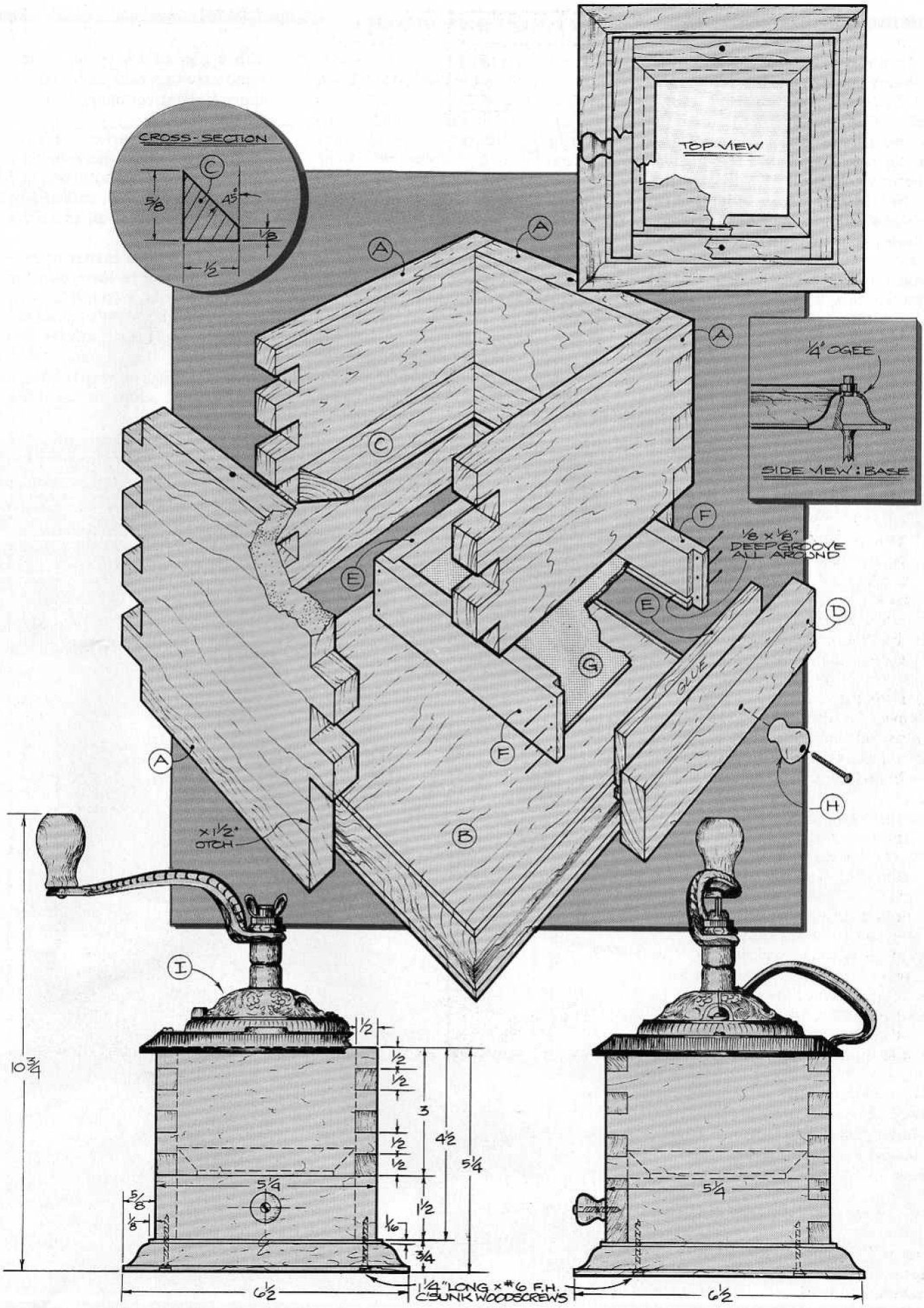
The cover strips (C) serve to keep the coffee grounds from settling on the top edges of the box ends and sides. We've used mills that don't have them and found that when the drawer is opened, the coffee on the top edges spills all over. Cut the strips to the profile shown in the cross-section, then miter the corners and glue in place.

After final sanding, we applied two coats of Behlen's Salad Bowl Finish, a low-luster finish that contains ingredients approved by the U.S. Food and Drug Administration for use in contact with food. Woodcraft Supply sells it (part number 08N65-EZ) for $6.50 per pint.

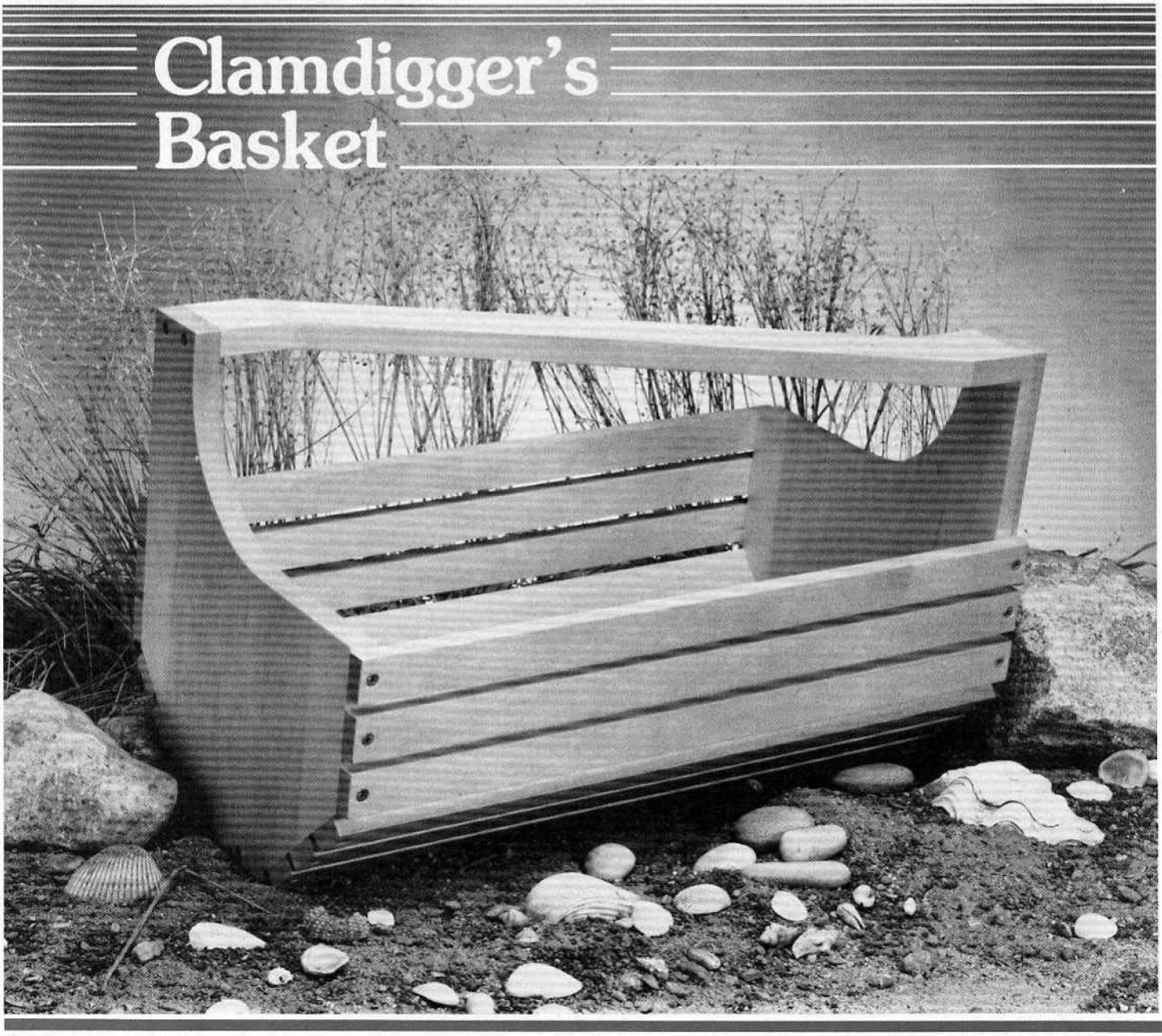
The mill (I) is joined to the box with a pair of screws, one on each side. A porcelain knob (H) added to the drawer front completes the project.WWJ






CROSS-SECTION
C
5/8
45°
1/8
1/2
TOP VIEW
A
1/4" OGEE
SIDE VIEW: BASE
F
1/8 x 1/8" DEEP GROOVE ALL AROUND
E
D
G
GLUE
H
A
B
x 1 1/2" DTCH
I
10 3/4
1/2
1/2
1/2
3
4 1/2
5 1/4
1/2
1/2
5 1/4
5/8
1/8
1/2
1/16
3/4
6 1/2
1 1/4" LONG x #6 F.H. CSUNK WOODSCREWS
5 1/4
6 1/2

Clamdigger's Basket



Here's a somewhat scaled-down version of a basket commonly used by early New England clam-diggers. This one is rather unusual in that the handle is not centered. Instead, it runs diagonally, presumably to improve balance. If there are no clam beds in your area, it will still serve nicely as a magazine rack or as a means to display your favorite floral arrangement.

Make the two sides (A) first. Cut ¾ in. thick pine to a width of 10 in. and a length of 12 in., then use the table saw to cut the 45 degree corners as shown. Note that each corner measures 4⅛ in. Next, use a compass to scribe the 4⅛ in. radius before cutting it out with the band or saber saw.

The 15 slats (B) are made from five-quarter pine stock (which measures 1⅛ in. thick) ripped to ½ in. widths. It's best to cut them slightly longer than necessary so that after assembly they can be trimmed and sanded flush to the sides. Use glue and 1¼ by no. 8 flathead wood screws to join the slats to the sides. The end view shows the proper slat spacing. Note that each screwhead is countersunk slightly below the surface.

To make the handle (C) you'll need a piece of ¾ in. thick stock measuring 4½ in. wide and 22 in. long. Lay out the handle shape as shown in the top view before cutting it out with a band or saber saw. Trim the ends for a snug fit between the sides, then assemble with a pair of 1½ by no. 8 flathead woodscrews on each end. Once again, apply a slight countersink to each of the screwheads.

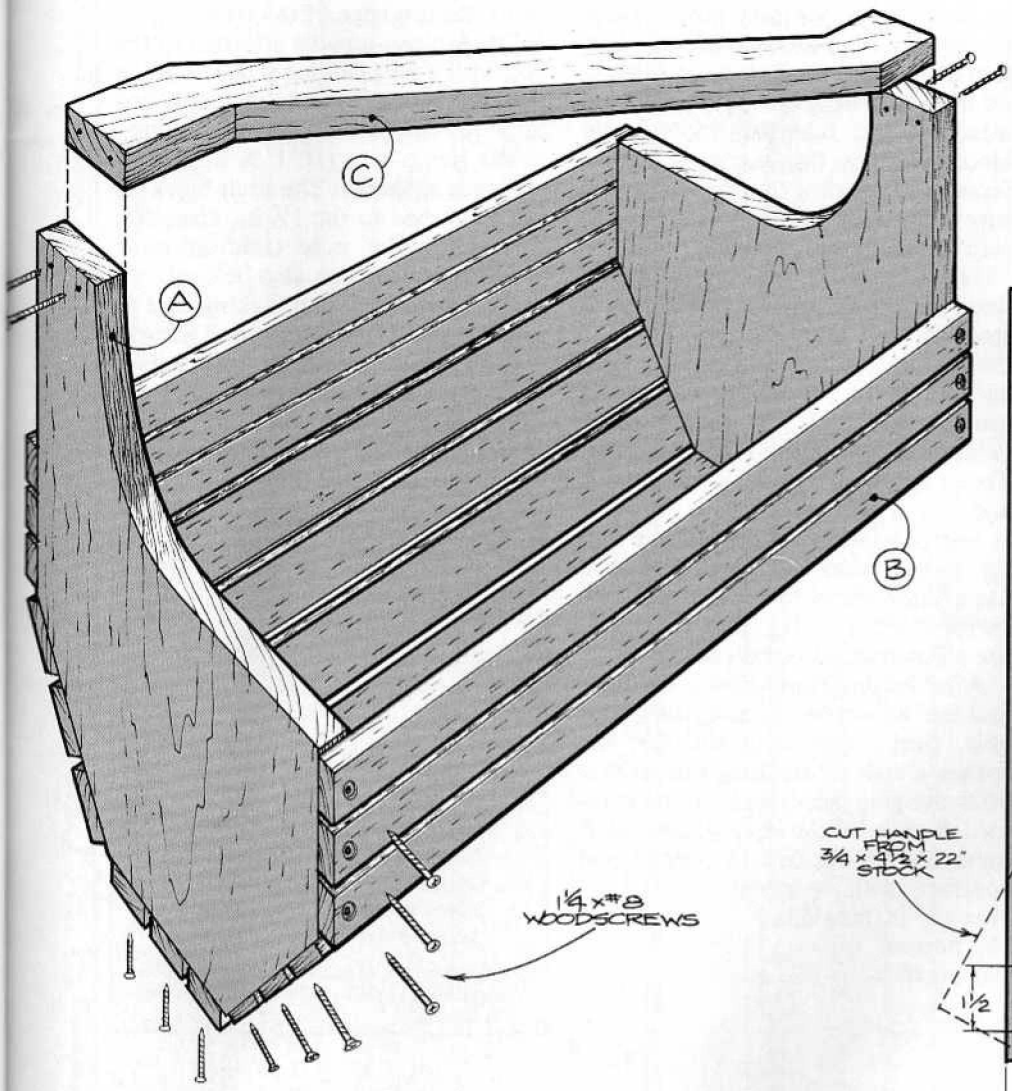
Final sand all surfaces, taking particular care to smooth the upper curve on each side. Start with 80 grit, then follow with 120, 150, and finally 220. Slightly round over all sharp corners and edges.

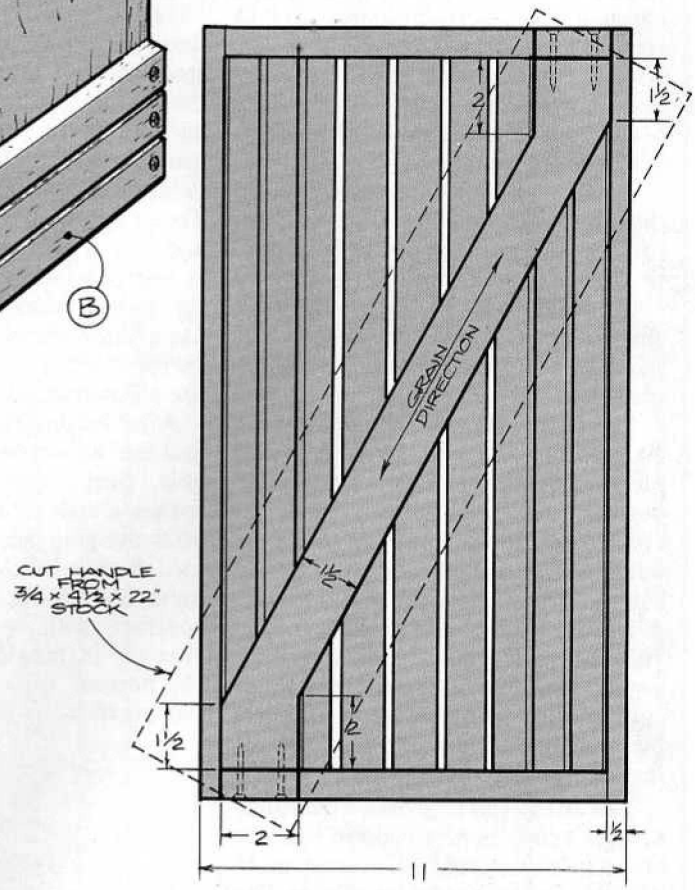
Final finish is a matter of personal taste. We chose to leave ours natural and simply add a couple of coats of Watco Danish Oil. We found a brush helped to apply the finish between the slats. Once the second coat was thoroughly dry, it was rubbed down with a clean cloth to complete the project. WWJ

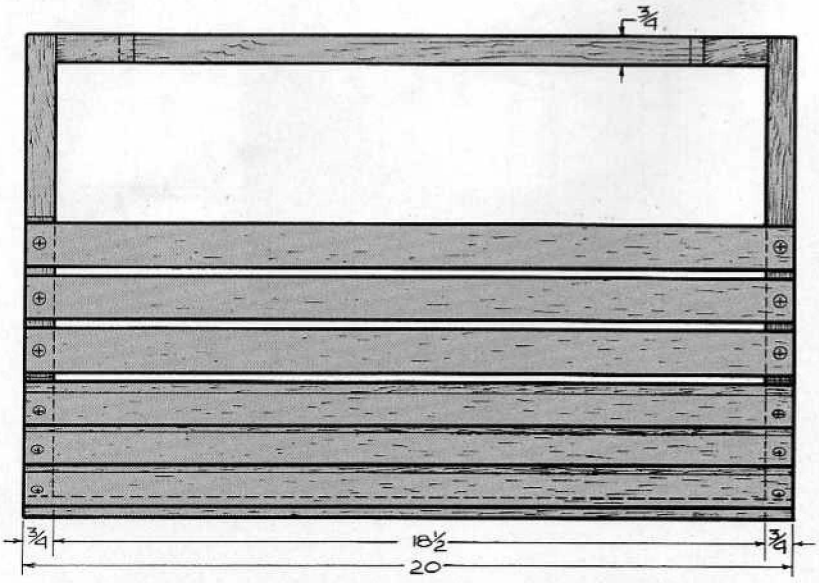
Bill of Materials
(all dimensions actual)

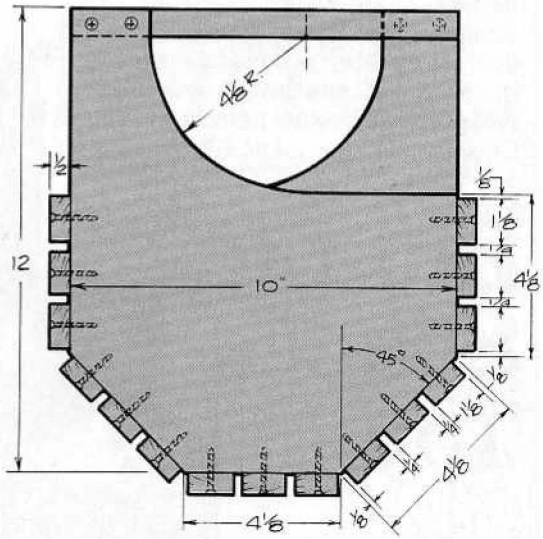
Part	Description	Size	No. Req'd.
A	Side	¾ × 10 × 12	2
B	Slat	½ × 1⅛ × 20	15
C	Handle	¾ × 4½ × 22*	1

*Length and width dimensions allow extra stock.









Box of Shapes Toy

The ability to recognize shapes is an important part of a young child's development. This easy-to-make toy will help kids to learn several of the basic shapes — and have some fun while they learn. Five different profiles are cut into the box, one in each of the four sides and one in the top. The child is challenged to get the blocks in the box, and that can only be done if the shape of the block matches the cutout. A double ball catch keeps the hinged top shut until the youngster opens it to remove the blocks.

Ours is made from poplar, a wood that is relatively light, yet durable. Maple, which has excellent durability, is also a good choice.

A piece of stock measuring ½ in. thick by 5½ in. wide by 20 in. long will provide enough stock for the four sides (A), while a piece that's ½ in. thick by 5½ in. wide by 11 in. long will suffice for the top (C) and bottom (D). The width and length dimensions allow extra stock.

The four sides (A) are cut from the 20 in. long board. After thickness planing, set the table saw blade to 45 degrees, then raise it to a height of about ¾ in. Set the rip fence to cut the miter along one edge of the 20 in. length. When setting the fence, keep in mind that it should be located so that, after the miter is cut, the stock width is not less than 5 in. Now, with one miter cut, readjust the rip fence to establish the final stock width of 5 in., then cut the second miter.

To cut the spline groove (see spline detail), you'll need to lower the saw blade (which should still be set at 45 degrees) and relocate the rip fence. Use scrap stock to check the accuracy of your set-up. Most saw blades make a ⅛ in. wide cut, however if your blade makes a slightly wider or narrower cut, simply adjust the spline (B) thickness as needed.

The stock can now be crosscut into four pieces, each piece measuring 4½ in. long. To cut the dado groove along the bottom edge of each side (see bottom detail), a ¼ in. dado head cutter is set to a depth of ¼ in. and the rip fence is located ¼ in. from the nearest tooth. Hold the stock firmly against the rip fence as it's pushed over the cutter. Be sure to use a push stick to keep hands a safe distance from the blade.

The ½ in. by 5½ in. by 11 in. board that was made earlier will serve as stock for the top and bottom. To make the bottom, cut to 4⅜ in. square, then cut the ¼ in. by ¼ in. rabbet all around. The top is 5 in. square with a ¼ in. radius cove cut on the front edge. To cut the cove, we used a router table and a ¼ in. cove bit.

Next, on the four sides and the top, lay out and mark the five shapes, then use a sharp chisel to cut out each one except the circle. To make the circle, use a Forstner bit or hole saw.

After cutting four splines, the sides and the bottom can be assembled with glue, then clamped firmly. Cut the splines a little on the long side so that after the glue dries, they can be trimmed flush with the ends of the sides. Since it must be free to expand and contract with seasonal changes in humidity, the bottom is not glued in place. With the box assembled, the router table and ¼ in. cove bit are once again used to add a cove, this time along the top edge of the front.

The top can now be attached to the box with a pair of hinges (G). Adding the catch block (E) and the double ball catch (F) completes work on the box.

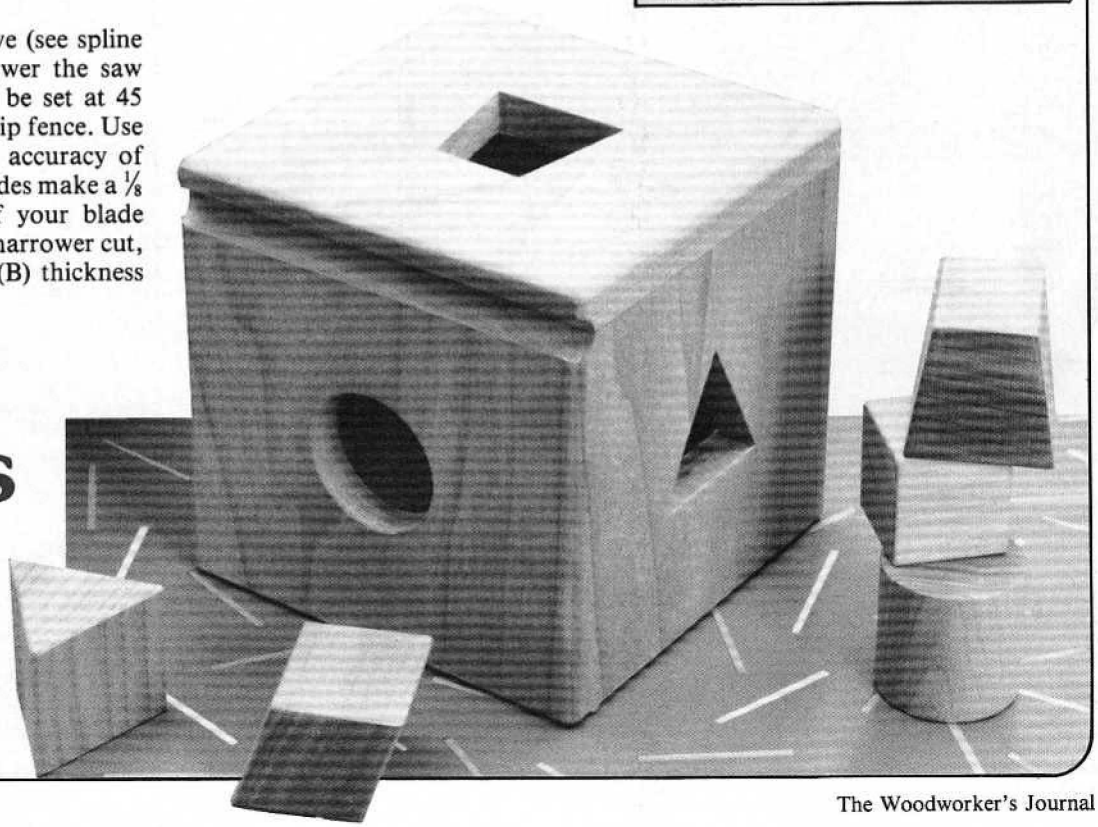
The five blocks (H, I, J, K, and L) are made as shown. The circle block (J) can be turned to the 1½ in. diameter, although closet pole (sold at most hardware stores) can also be used.

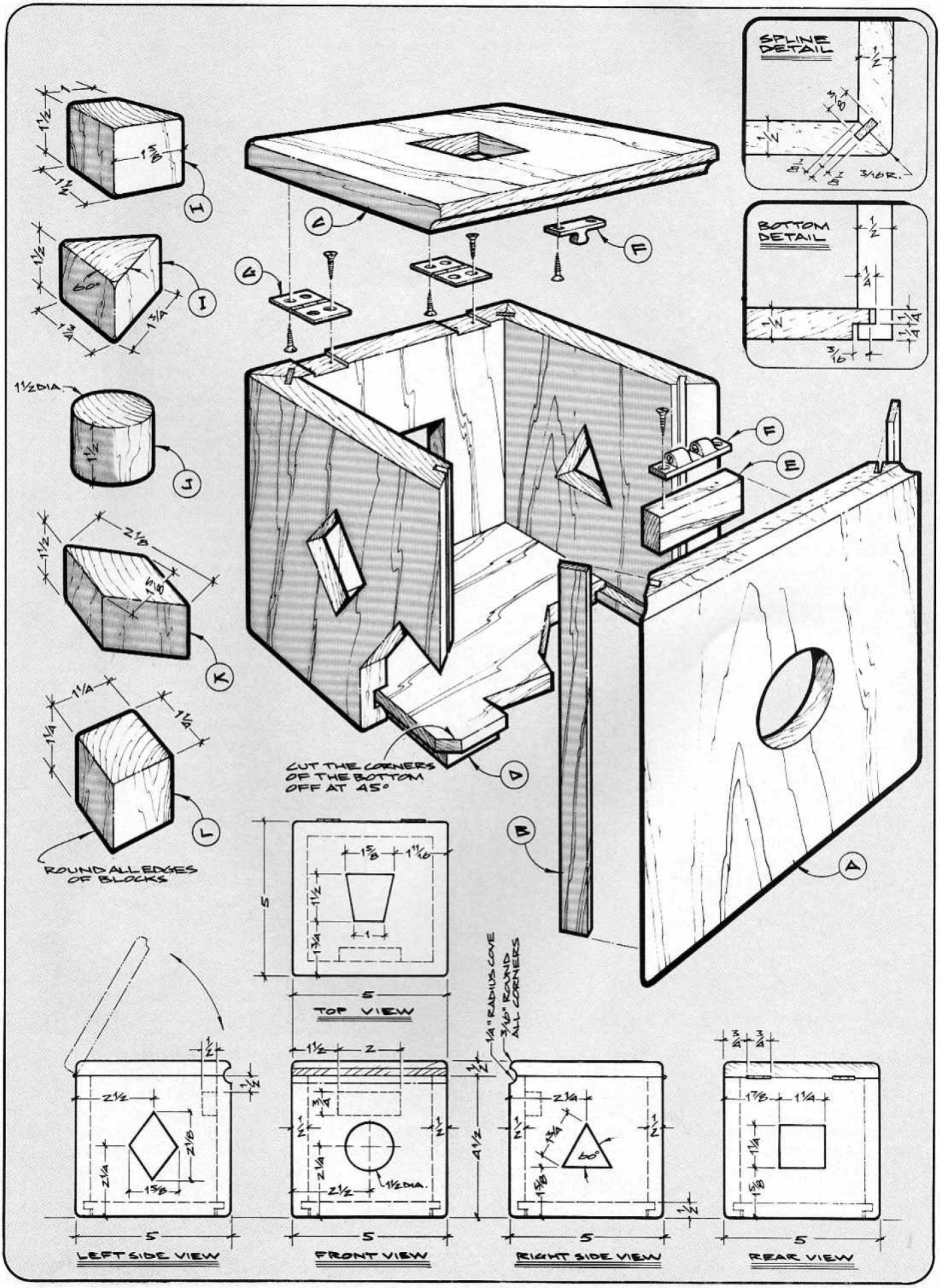
Final sand each part, taking care to round over all sharp edges and corners to a generous (about 3/16 in.) radius. Since small children have a natural inclination to chew on just about anything, we feel it's best not to apply a finish to a toy like this.

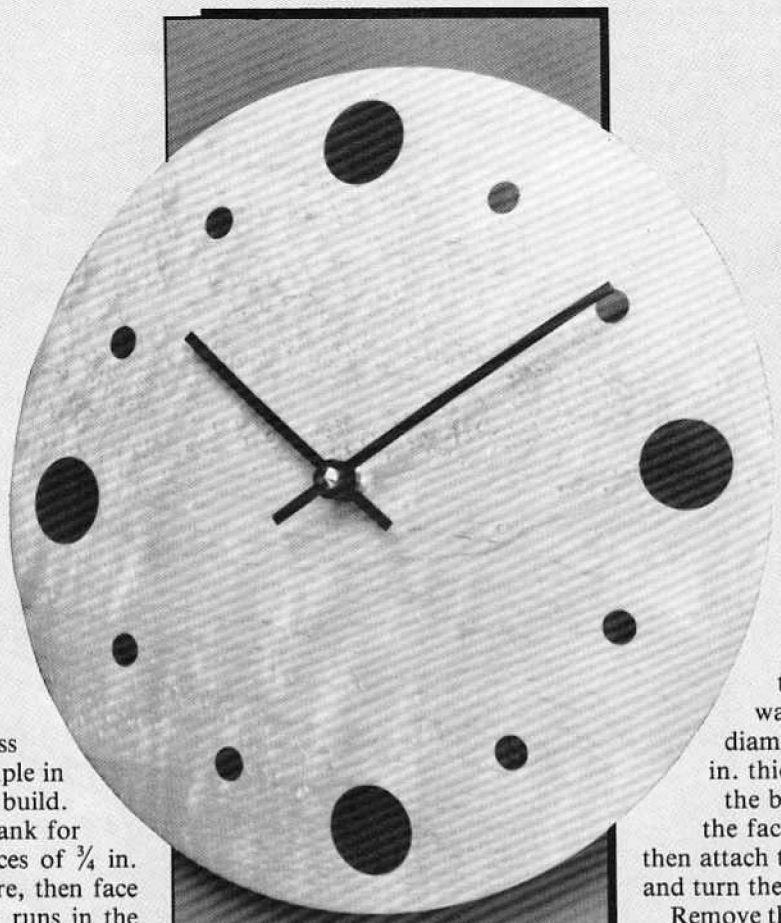
Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Side	½ × 5 × 4½	4
B	Spline	⅛ × ⅜ × 4½	4
C	Top	½ × 5 × 5	1
D	Bottom	½ × 4⅜ × 4⅜	1
E	Catch Block	½ × ¾ × 2	1
F	Double Ball Catch	5/16 × 1 1/16*	1
G	Hinge	¾ × 1	2
H	Trapezoid Block	see detail	1
I	Triangle Block	see detail	1
J	Circle Block	see detail	1
K	Diamond Block	see detail	1
L	Square Block	see detail	1

*Available from Mason & Sullivan, 586 Higgins Crowell Road, West Yarmouth, MA 02673.




SPLINE DETAIL
BOTTOM DETAIL
CUT THE CORNERS OF THE BOTTOM OFF AT 45°
ROUND ALL EDGES OF BLOCKS
TOP VIEW
LEFT SIDE VIEW
FRONT VIEW
RIGHT SIDE VIEW
REAR VIEW
1/4" RADIUS COVE
3/16" ROUND ALL CORNERS



Disk Clock

In order to please the eye, a woodworking project need not necessarily require a month of work or a week's paycheck. In fact, some of the most appealing projects we've ever come across have been remarkably simple in design and inexpensive to build.

To make the turning blank for the disk (A), cut two pieces of ¾ in. thick stock to 10 in. square, then face glue (make sure the grain runs in the same direction) and clamp the two parts to create a block that measures 1½ in. thick by 10 in. square. When dry, use a compass to scribe a 9¾ in. diameter (4⅞ in. radius) circle and, with a band or saber saw, cut out the circle, staying slightly on the waste side of the line.

The best surface of the blank should face the front, so at this point, examine both sides to determine the front and back of the clock. Now, on the back of the clock, again use the compass, this time to scribe a 2 in. radius (4 in. diameter) circle. Later on, this circle will serve as a guide when the faceplate's waste circle is attached. Now, on the clock's front side, scribe the 3 9/16 in. radius (7⅛ in. diameter) for the small markers (C) and the 3⅞ in. radius (7¾ in. diameter) for the large markers (B).

Next, at the centerpoint of the circle, bore a ⅜ in. diameter hole completely through the stock, taking care to make sure the hole is square. Now, on the back side, lay out and mark the location of the 2½ in. square mortise. Use a sharp chisel to cut the mortise to a depth of ¾ in. Our mortise was sized to accept a quartz movement sold by Mason and Sullivan, 586 Higgins Crowell Road, West Yarmouth, MA 02673 (part number 3609X-34, current price $6.95 each plus shipping). However, if you plan to use another movement, you may need to revise the mortise dimensions we've given.

Bill of Materials
(all dimensions actual)

Part	Description	Size	No. Req'd.
A	Disk	9¾ dia. × 1½ thick*	1
B	Large Marker	1 dia. × ¾ thick*	4
C	Small Marker	⅜ dia. × ¾ thick*	8
D	Quartz Movement		1
E	Hour/Minute Hand		1 pair
F	Second Hand		1

*Thickness dimension before turning.

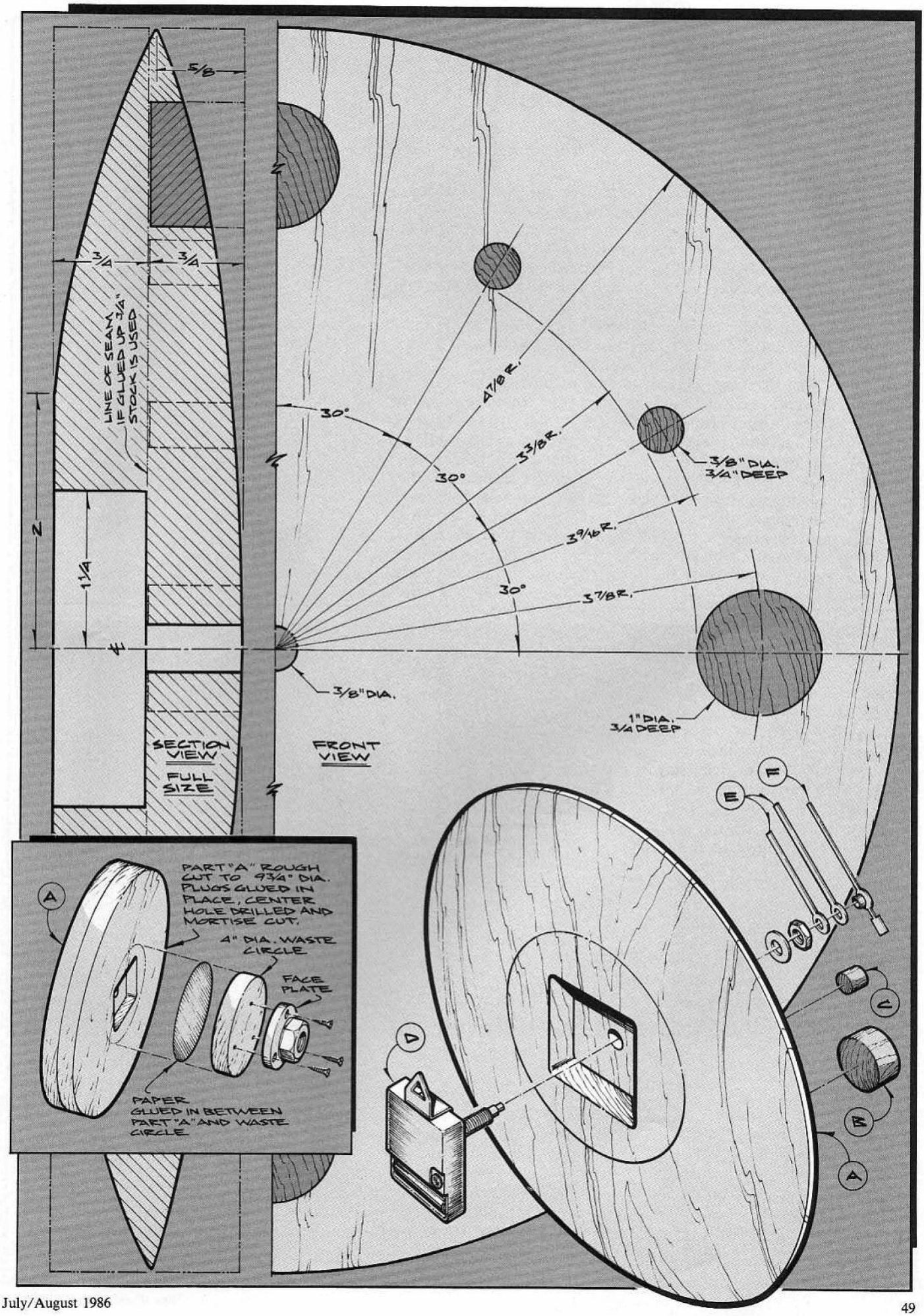
Lay out the location of the large and small markers on their respective radii, then bore holes as shown in the front view. Turn the four large markers (B) to a 1 in. diameter, and the eight small markers to a ⅜ in. diameter before cutting them to ⅞ in. lengths. Use glue to assemble each one in place, allowing ⅛ in. to protrude. To make the waste circle, scribe a 4¼ in. diameter circle on a piece of ¾ in. thick stock and cut out with the band or saber saw. Attach the faceplate to the waste circle, then attach the faceplate to your lathe and turn the circle to a 4 in. diameter.

Remove the faceplate from the lathe before gluing the waste circle to the back of the disk blank. Note that a piece of paper (brown grocery bag type works well) is sandwiched in between. The paper will make it easy to remove the waste circle later on. The 4 in. diameter circle previously scribed on the back of the disk blank will come in handy to help center the waste circle.

When the glue has thoroughly dried, mount the faceplate to the lathe. Using a roundnose cutter, turn the blank to the profile shown in the full-sized sectional view. Note that the profile is designed so that the glue line can't be seen from the front.

Sand thoroughly while still on the lathe, smoothing to 220 grit. For a final finish we applied three coats of Deft's Semi-Gloss Clear Wood Finish, rubbing down the final coat with 0000 steel wool.

The movement is assembled as shown. We used Mason and Sullivan's Universal hour and minute hands (part number 4880X, 70¢ per pair) and second hand (part number 4892X, 50¢ each). These hands are longer than needed, so you'll have to clip each one to length. The hanger (supplied with the movement) permits the clock to be hung on the wall. WWJ


5/8
3/4
3/4
LINE OF SEAM IF GLUED UP 3/4" STOCK IS USED
2
1 1/4
SECTION VIEW
FULL SIZE
FRONT VIEW
30°
30°
30°
4 7/8 R.
3 3/8 R.
3 9/16 R.
3 7/8 R.
3/8" DIA. 3/4" DEEP
3/8" DIA.
1" DIA. 3/4 DEEP
PART "A" ROUGH CUT TO 9 3/4" DIA. PLUGS GLUED IN PLACE, CENTER HOLE DRILLED AND MORTISE CUT.
4" DIA. WASTE CIRCLE
FACE PLATE
PAPER GLUED IN BETWEEN PART "A" AND WASTE CIRCLE
A
B
C
D
E
F

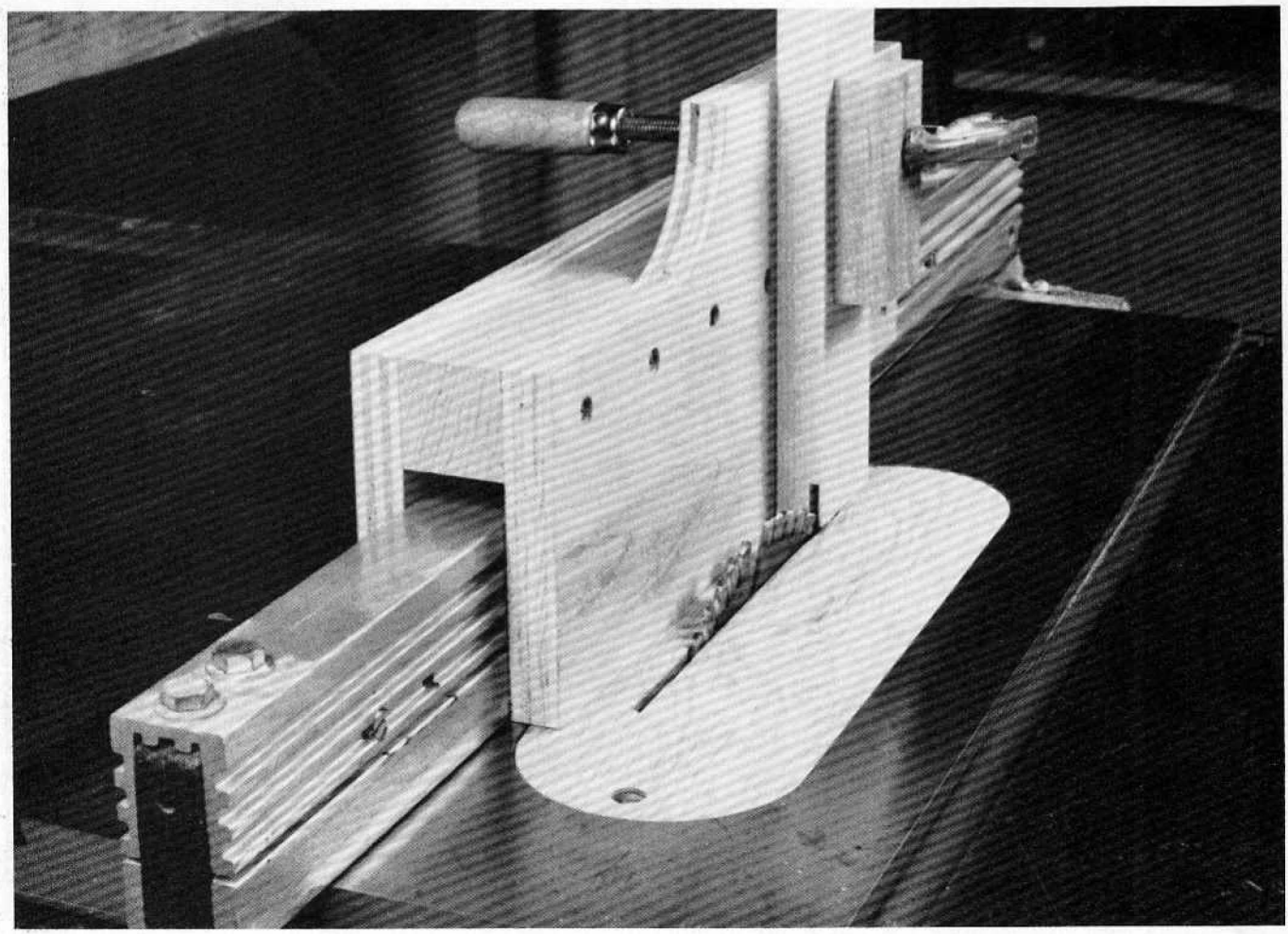
Tenon Jig

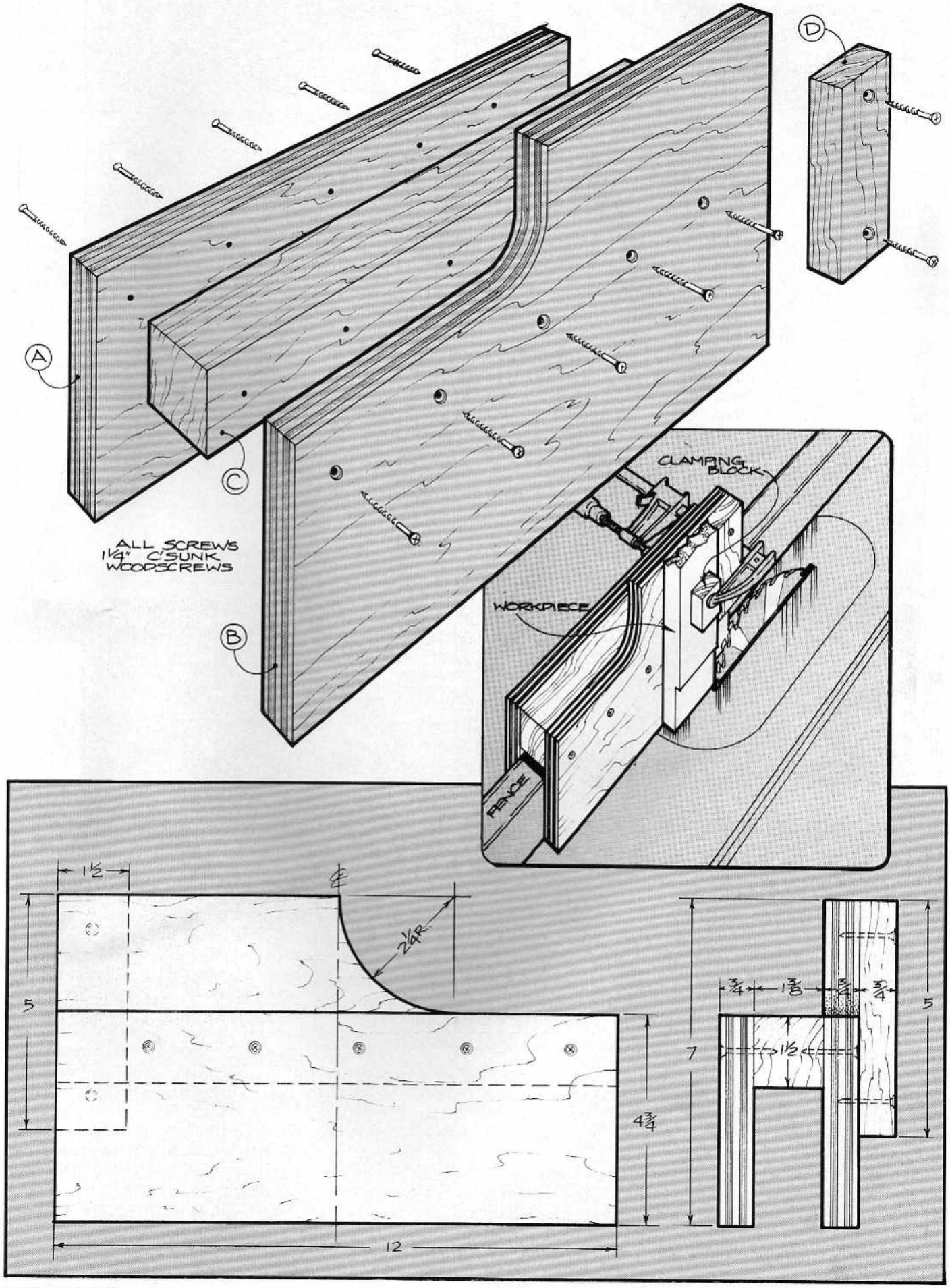
The tenon jig is one of the most frequently used table saw accessories. Although it is used primarily to cut tenons, the jig can also be used to groove, bevel, or perform any number of other operations on the ends of boards. As shown in the photo, the workpiece is positioned against the stop (D) and clamped securely to the jig. A clamp block protects the workpiece from the clamp jaws.

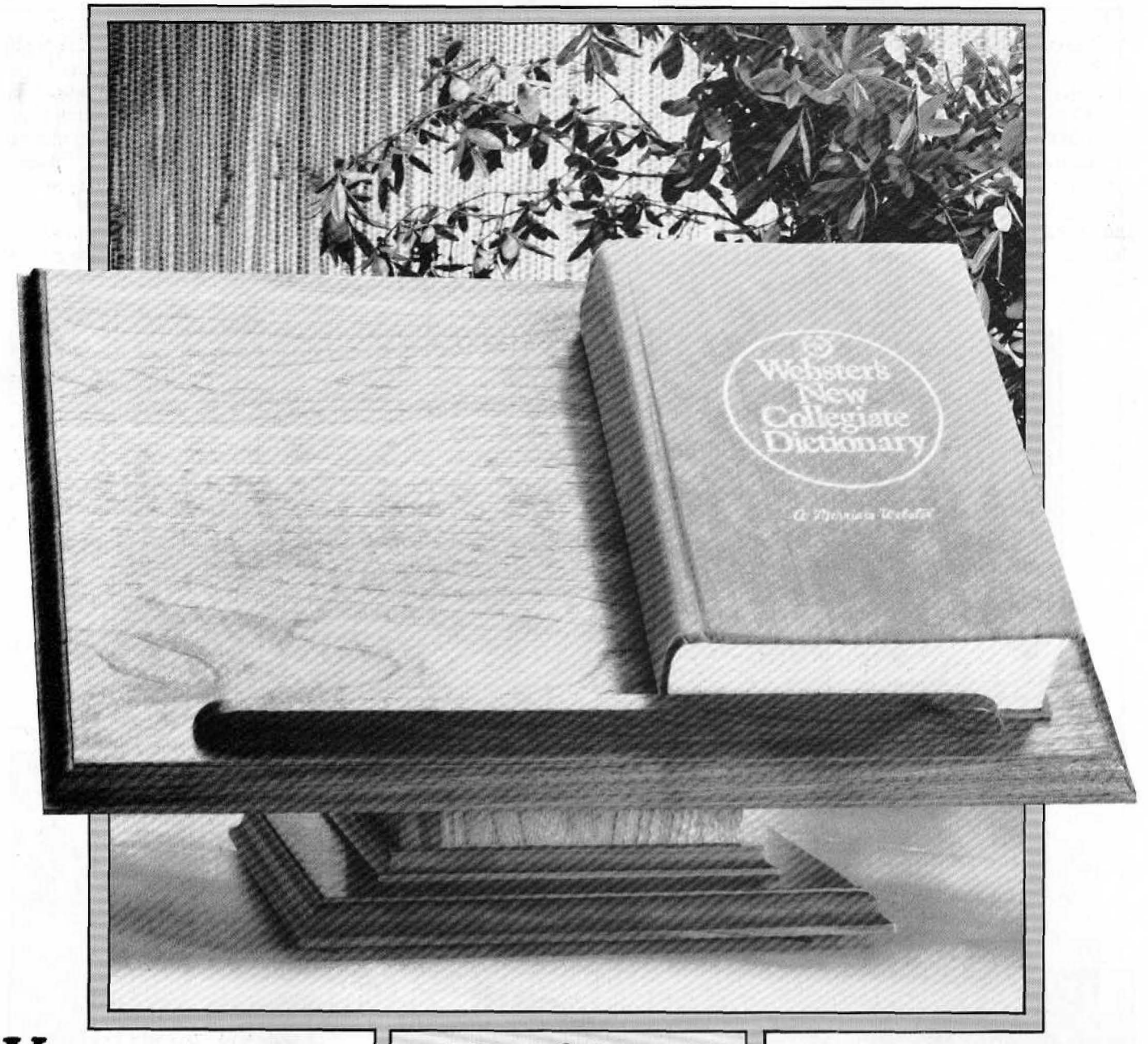
Most commercially sold tenon jigs mount in the miter gauge slot. Since our jig fits over the table saw fence, it is adjustable to practically any position.

The jig shown is sized to fit our table saw, a Rockwell Unisaw. Naturally you must size your tenon jig to fit the fence on your particular saw. The jig sides (A and B) are ¾ in. thick birch plywood, while the center section (C) and stop (D) are solid hardwood. When making the jig, keep in mind that all measurements and cuts should be accurate. The jig must fit snugly over the fence, yet must not be so tight that it is prevented from sliding back and forth. Assemble the jig with glue and countersunk screws, as illustrated. No finish is needed, although an occasional coat of paraffin wax on the surfaces that contact the saw will help the jig slide smoothly.

WWJ




A
B
C
D
ALL SCREWS
1¼" C'SUNK
WOODSCREWS
CLAMPING
BLOCK
WORKPIECE
FENCE
1½
2¼R
5
4¾
12
7
¾
1⅛
¾
¾
1½
5



Desktop Dictionary Stand

Designed by John L. McPartland

Keep your favorite dictionary close at hand with this handsome stand. We used walnut for ours, but cherry, mahogany, or oak would also be good choices.

The front (A) and back (C) can be made first. Cut ¾ in. stock to a width of 4¾ in. and a length of about 14 in., then use the table saw to cut the ⅛ in. wide by ⅜ in. deep spline groove along the center of both edges. Most saw blades make a ⅛ in. wide cut, so just one pass should be needed. If your saw blade makes a slightly wider or narrower cut, simply adjust the spline thickness as needed.

Once the spline grooves have been cut, set the table saw blade to make a 40 degree miter (see side view), then cut the front to an overall length of 4⅛ in. The back is then cut to an 8¾ in. overall length.

To make the two sides (B), cut a piece of ¾ in. thick stock to a width of 6¼ in. and a length of about 18½ in. With the table saw blade set to make a ⅜ in. deep cut, locate the rip fence 5/16 in. from the blade. One pass should be all that's needed to make each groove. As mentioned earlier, if your saw blade makes a cut that's slightly wider or narrower than ⅛ in., you'll have to adjust the 5/16 in. dimension accordingly.

Now that the spline grooves have been cut in both sides, crosscut the stock into two 9¼ in. lengths. Set the miter gauge to make a 40 degree cut (see side view), then cut the miter on each end. Next, set the miter gauge to make a 90 degree cut and trim the end opposite the miter to establish the 8¾ in. length.

Make the two cleats (D), boring the four screw holes as shown, then glue and screw to the front and back. The front, back, sides, and cleats can now be assembled. Rip the ⅛ in. thick splines from ¾ in. thick stock. Make them a bit longer than necessary so they can be trimmed flush after assembly. Apply glue to the four splines and their respective grooves, then assemble and clamp. Check for squareness and make sure all edges are flush before setting aside to dry.

The bottom (E) is made from ½ in. thick stock cut to 7¼ in. square. We used the router table equipped with a ¼ in. cove cutter to cut the cove as shown in the front view detail. The base (F) is made from ¾ in. thick stock that's cut 9½ in. wide by 10½ in. long. A ¼ in. Roman ogee bit is used to cut the molding on all four edges. The bottom and base can now be glued and clamped together as shown. Before gluing though, it's a good idea to drive a couple small brads into one of the mating surfaces, then snip the heads off so about 1/16 in. protrudes. The brads will keep the two parts from sliding when clamp pressure is applied.

To make the shelf (G), cut ¾ in. stock to 13 in. wide by 19 in. long, then add the ¼ in. Roman ogee molding to all four edges. Next, cut the lip (H) to size and join it to the shelf with glue and three ⅛ in. diameter by ¾ in. dowels. Be sure to add the ¾ in. radius to each end of the lip before assembly.

All parts can now be final sanded. Take particular care to thoroughly sand the molded edges, especially the end-grain surfaces.

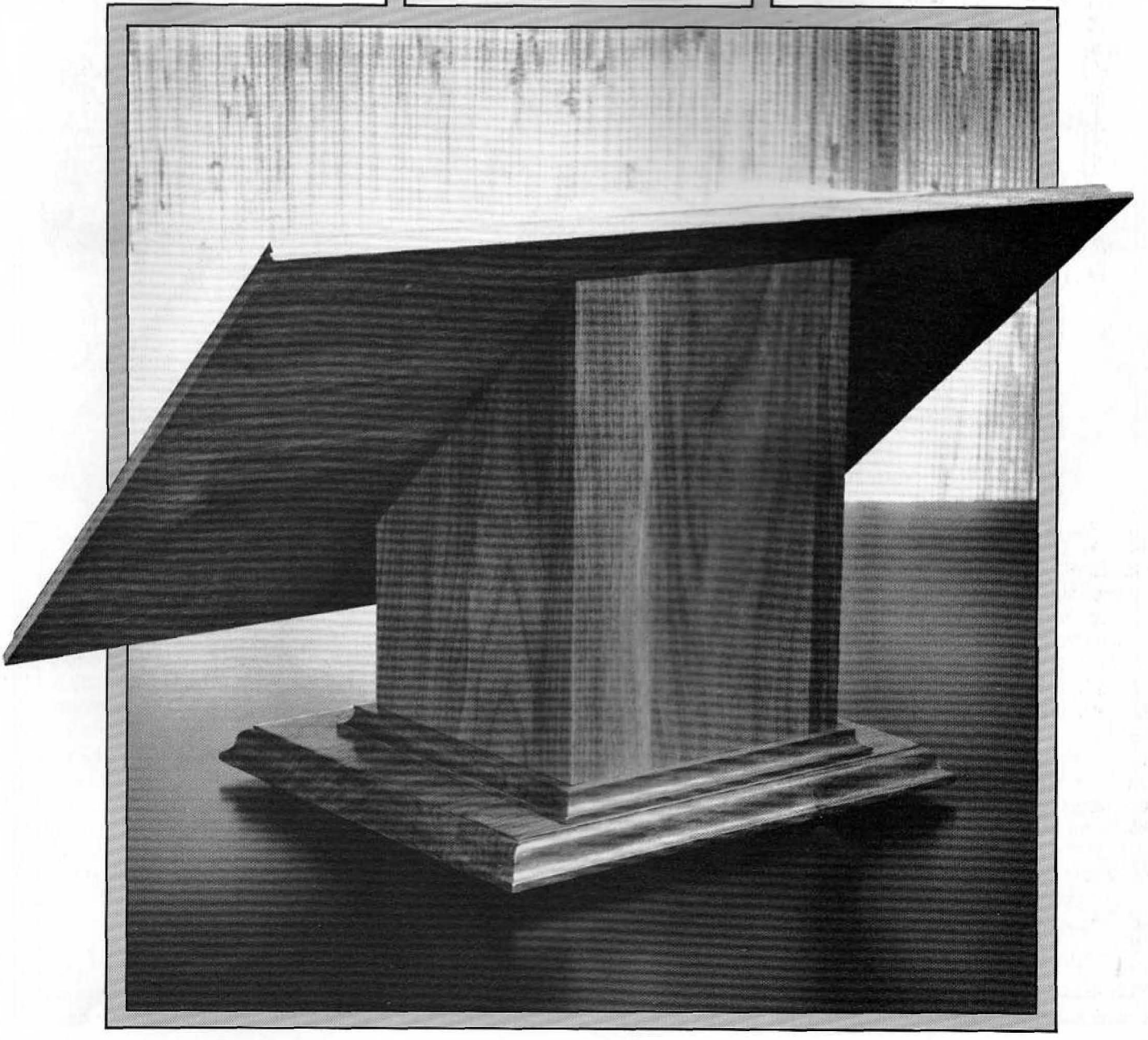
The shelf can now be joined to the subassembly consisting of parts A, B, C, and D. A pair of screws driven up through the cleats and into the shelf serve to hold the shelf in place. Four flathead screws driven up through parts E and F and into the bottom ends of parts A and C will complete assembly of the project.

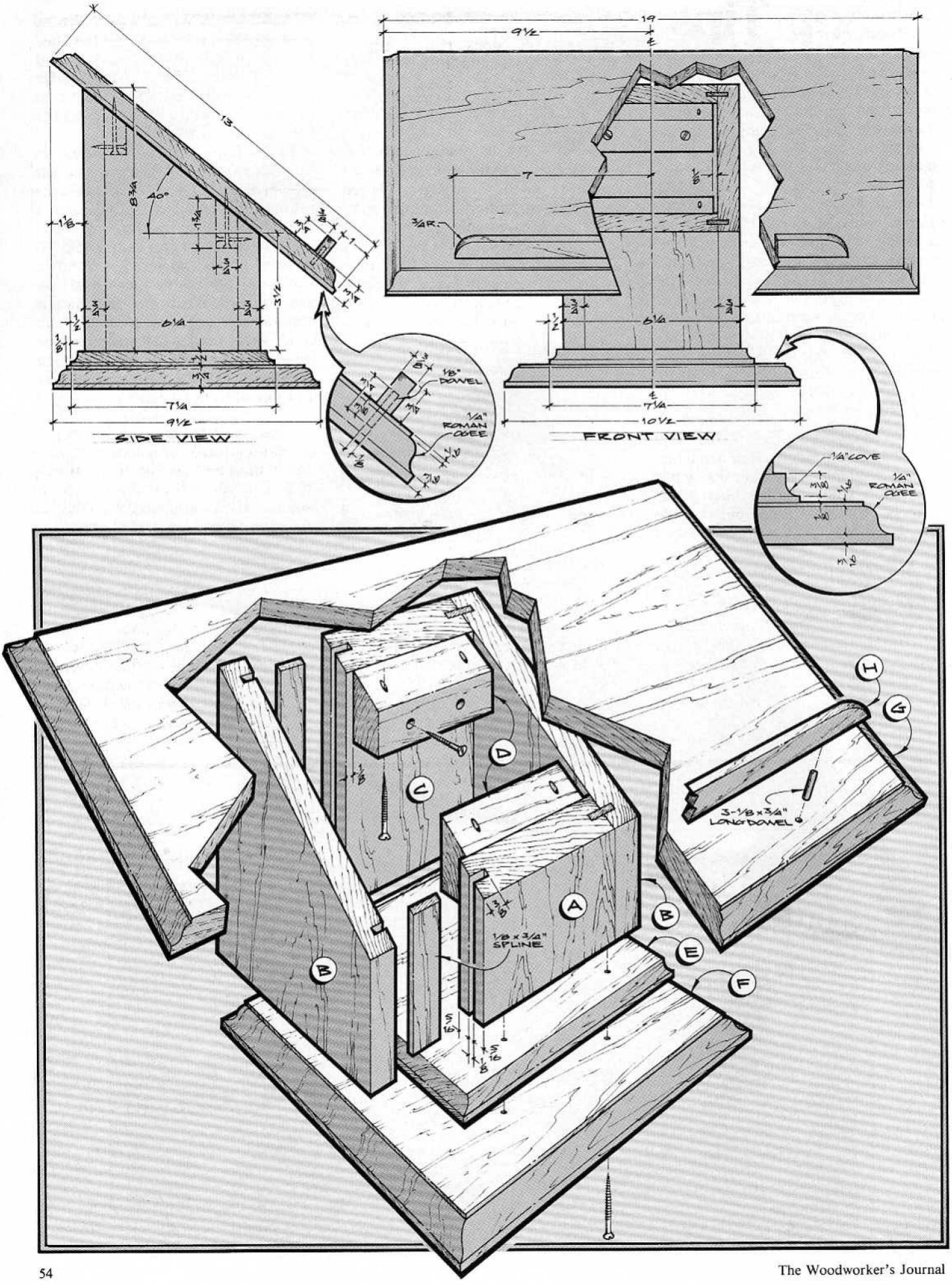
For a final finish we sprayed on three coats of Deft's Semi-Gloss Clear Wood Finish. One of our favorite finishes, it comes in a 13 ounce can, a convenient size for spraying small projects. Each coat takes only about 30 minutes to dry, so in 1½ - 2 hours you'll have the three finish coats on your project. When the final coat is dry, rub down the entire project with 0000 steel wool. To complete the finish, blow or wipe off any remaining steel wool particles, then apply a very thin coat of paste (Butcher's) wax. WWJ

(continued on next page)

Bill of Materials
(all dimensions actual)

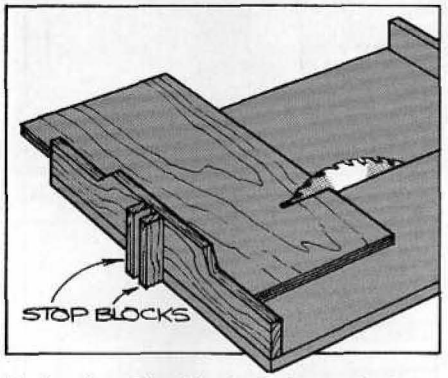
Part	Description	Size	No. Req'd.
A	Front	¾ × 4¾ × 4⅛	1
B	Side	¾ × 6¼ × 8¾	2
C	Back	¾ × 4¾ × 8¾	1
D	Cleat	¾ × 1¾ × 4½	2
E	Bottom	½ × 7¼ × 7¼	1
F	Base	¾ × 9½ × 10½	1
G	Shelf	¾ × 13 × 19	1
H	Lip	⅞ × ¾ × 14	1




SIDE VIEW
FRONT VIEW
1/8" DOWEL
1/4" ROMAN OGEE
1/4" COVE
3-1/8 x 3/4" LONG DOWEL
1/8 x 3/4" SPLINE
A
B
C
D
E
F
G
H

Shop Tips

I constructed a cut-off table for my table saw last year and added a feature that I feel makes this jig safer to use. I positioned two "stopblocks" on the front fence, one on either side of the

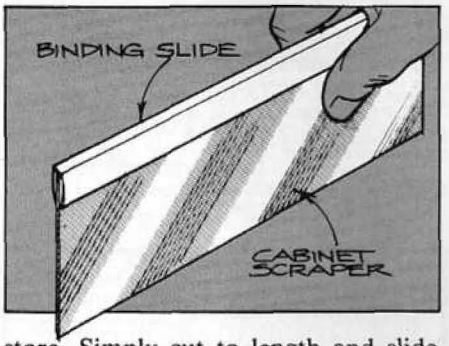


blade slot. The blocks help remind me not to put my thumb over the slot, and they also keep my thumb from accidently sliding over the slot when pushing the jig over the blade. This feature is not foolproof but it could prevent a serious cut, or worse yet, loss of a thumb.

William A. Matz, Dover, Del.

When turning tenons it's helpful to have a gauge that will enable you to quickly and accurately check your progress. Here's how to make one in short order. Select the drill bit that will be used to bore the mortise diameter you want, then use it to drill a hole through scrap stock that measures about ½ in. thick. Cut the hole in half and you'll have a gauge that's perfect for checking the tenon diameter you'll need.

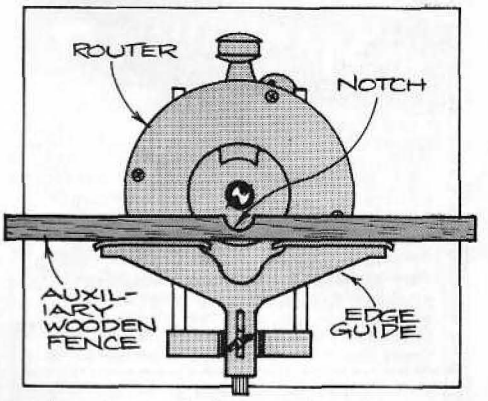
Using a cabinet scraper for any length of time can leave your hands cut and sore from the sharp edges. To keep pain and suffering to a minimum, cover the exposed edges with binding slide. Binding slide, sometimes called binding channel, is the 11 in. long plastic strip used to bind loose pages in those vinyl "term paper" folders. You can get it at just about any stationery



store. Simply cut to length and slide over the problem edges.

Bruce E. Montag, Aston, Penn.

Lengthening your router edge-guide with an auxiliary wood fence results in considerably more bearing surface, and that makes it easier to control the router. We find it especially helpful



when the router bit must run to a corner where only about half the edge-guide is in contact with the workpiece. The notch serves as clearance for operations that require the edge-guide to be close to the cutter.

Next time you drop a screw or other small object and can't find it, try laying a flashlight on the floor to help you. The light will cause the object to shine and cast a long shadow. You'll be surprised how easy it is to spot your lost item.

Greg Mihalevich, Jefferson City, Mo.

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.*

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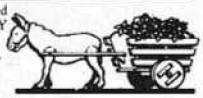

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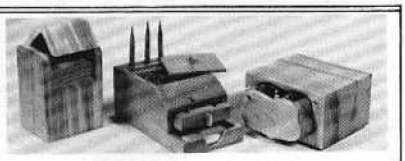

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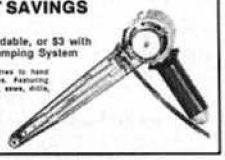

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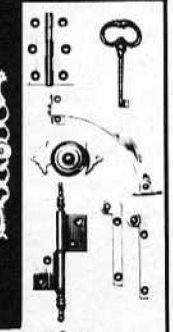

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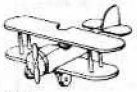

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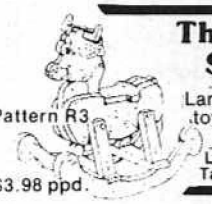

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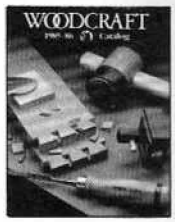

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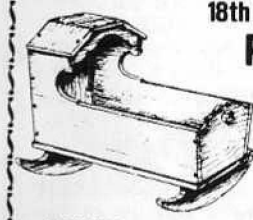

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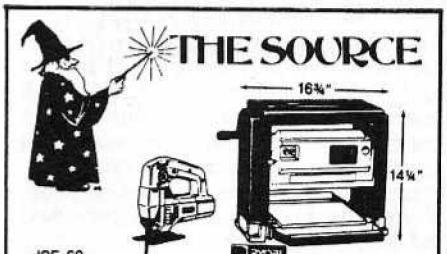

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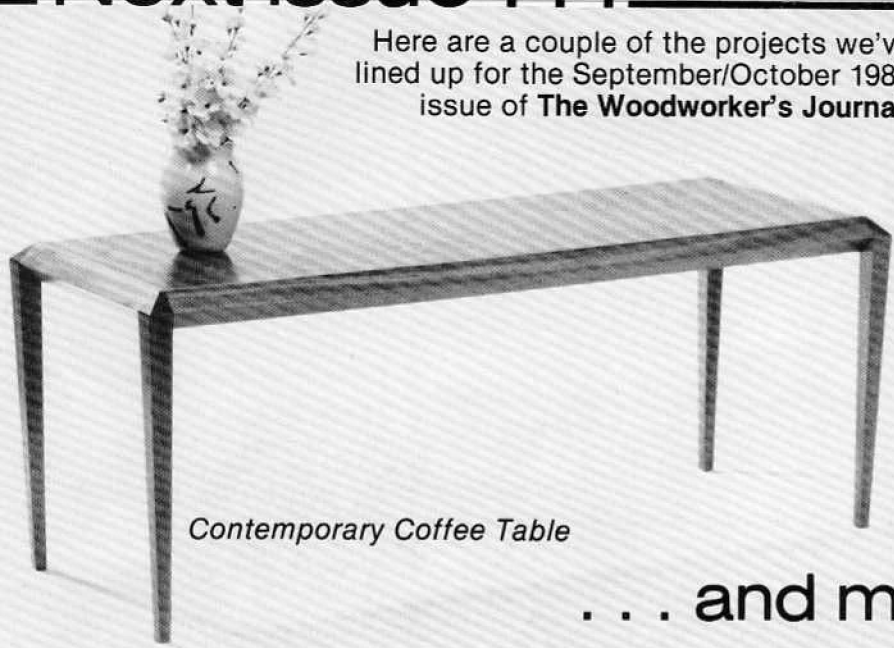
Next issue . . .

Here are a couple of the projects we've lined up for the September/October 1986 issue of **The Woodworker's Journal.**



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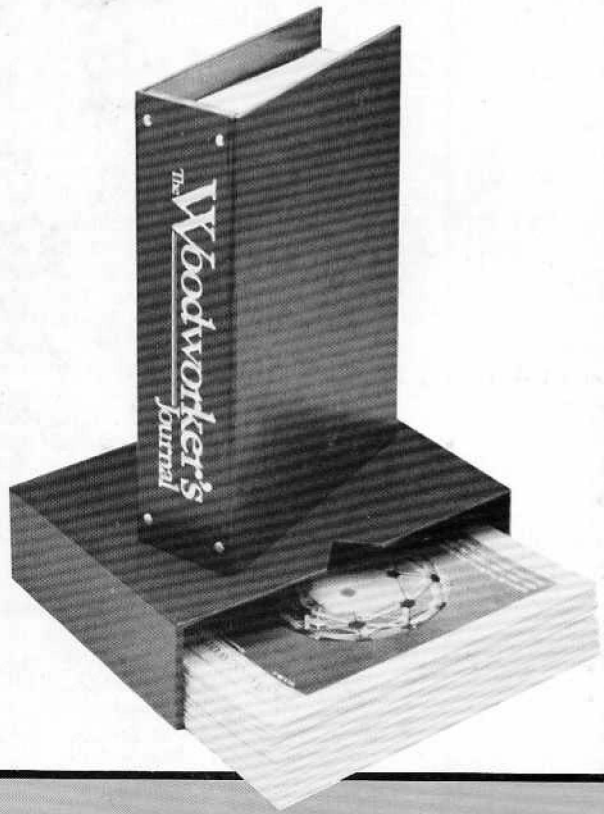

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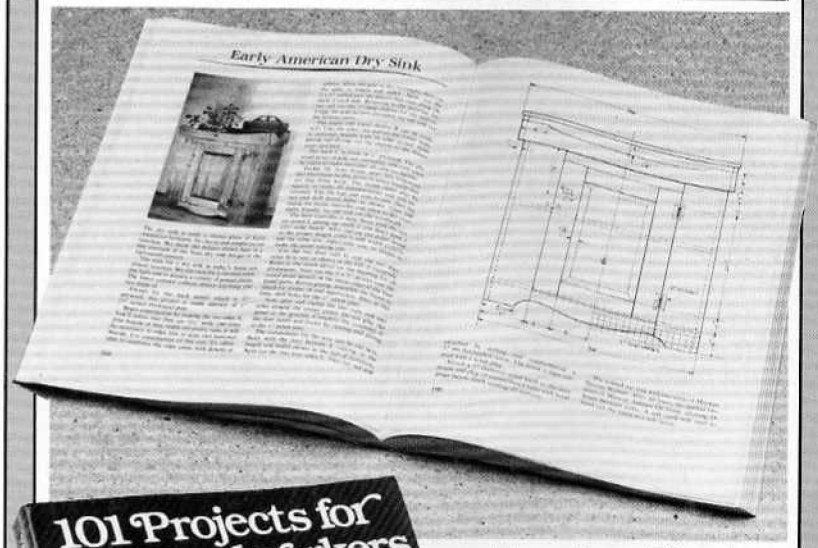

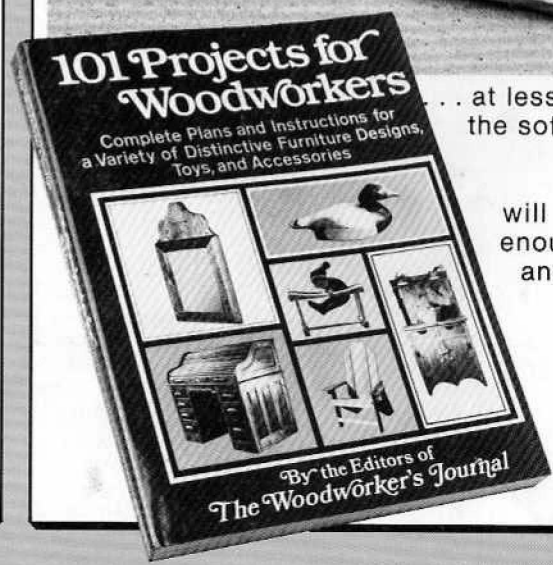

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