The Woodworker's Journal

Vol. 8, No. 5 $2.50

Included in this issue:

- Stereo Cabinet
- Shaker Woodbox
- Hall Table
- Toy River Ferry
- Bongo Box
- Shop Trammel
- Nesting Tables

Grandfather Clock, Part 1

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2040	15-5/8" Planer	1295.00
2400BW	10" Mitre Saw w/blade	259.50
2401BW	10" Mitre Saw w/blade w/electric brake	226.50
3601B	Router	128.95
3608BK	Router w/case	85.95
3612	3 H.P. Router	189.95
3700B	Laminate Trimmer	84.25
4200N	4-3/8" Circular Saw	94.50
4301BV	Vr. Sp. Orbital Jig Saw	129.95
5007NB	7¼" Circular Saw	103.95
5008NB	8¼" Circular Saw	105.00
5012B	12" Chain Saw	119.95
5081DW	3-3/8" Cord. Saw	110.40
5201NA	10¼" Circular Saw	226.50
5402A	16" Circular Saw	395.00
6000R	Uni-Drill	106.00
6010D	3/8" Cordless Drill	79.95
6010DL	Cordless Drill w/charger light & case	99.50
6010DWK	Cordless Drill w/Charger & case	88.75
6012HDW	Cord. Drill Kit 2-Sp.	105.95
6013BR	½" Reversible Drill	119.00
6300LR	½" Angle Drill	152.20
6510LVR	3/8" Dril-Rev.	69.00
6710DW	Cord. Screwdriver	107.10
6800DBV	Drywall Screwdriver	97.50
9030	1-1/8"x21" Belt	123.50
9035	Finishing Sander	49.95
9045B	Finishing Sander	99.50
9045N	Dustless Sander	112.50
9207SPB	7" Sander Polisher	136.95
9401	4"x24" Belt Sander	171.95
9501BKIT	4" Sander-Grinder Kit	85.75
9900B	3"x21" Belt Sander	125.50
9924DB	3"x24" Belt Sander	132.75
B04510	Finishing Sander	46.95
B04530	6" Round Finish Sander	52.95
DA3000	3/8" Angle Drill	116.50
DP3720	3/8" Reversible Dril	56.90
DP4700	Drill Reversible	96.95
GV5000	Disc Sander	49.95
HP1030	Hammer Drill	105.00
JG1600	Jig Saw Single Sp.	91.25
JR3000V	Recipro. Saw	134.75
JR3000W	2 Sp. Reciprosaw Kit	124.75

PONY CLAMP FIXTURES

	Each	Pkg. 6
No. 50 ¾" Pipe Clamp	7.70	6.95 ea
No. 52 ½" Pipe Clamp	6.90	6.40 ea
No. 1215 (WEB) 15'	6.40	5.80 ea
No. 7456 Clamp Pads	2.50	2.25 ea

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
No. 7284 84"	26.55	24.10 ea

JORGENSEN CLAMPS (Med. Duty)

No. 3712 12"	$6.15	$5.60 ea
No. 3724 24"	7.55	6.80 ea
No. 3736 36"	9.20	8.35 ea

JORGENSEN HAND SCREWS

No. 3/0 3"	$9.30	$8.40 ea
No. 0 4½"	10.90	9.85 ea
No. 1 6"	12.40	11.15 ea
No. 2 8½"	14.80	13.35 ea

JORGENSEN BAR CLAMPS (5" reach)

No. 4512 12" Open.	17.05	15.35 ea
No. 4524 24" Open.	19.05	17.15 ea
No. 4536 36" Open.	21.20	19.20 ea

JORGENSEN & PONY CLAMPS

No. 3325 3 Way Edging	$5.40	$4.90 ea
No. 1623 3" Hold Down	7.20	6.40 ea
No. 3202HT 2" Spring	2.15	1.90 ea

9x11 Non-Loading Silicon Carbide

Grit	A Weight	Pack of 100
400,360,320,280,240		
220,180,150,120		$19.50

RYOBI TOOLS

B7075	3x21 Belt Sander	$118.95
B7100	3x24 Belt Sander	148.50
B7200A	4x24 Belt Sander	167.90
D1010	3/8" Var. Sp. Drill	89.50
D1015A	3/8" Screwdriver/ Drill	111.95
D1310	½" Drill	89.95
D1320R	2 Sp. ½" Rev. Drill	99.95
E3700A	Drywall Screwdriver	77.95
JS-60	Jig Saw	99.95
JSE-60	Electronic Jigsaw	125.90
L-120U	3-5/8" Planer	81.25
L-1323 ALS	3¼" Planer	129.95
LS-35	Finishing Sander	46.95
L-580	6-1/8" Planer	189.00
R-150	1 H.P. Plunge Router	88.00
R-330	2 H.P. Router	139.70
R-500	3 H.P. Plunge Router	165.00
RA-2500	10" Radial Saw	449.95
S500A	3x5½ Finishing Sander	43.95
SU-6200	Finishing Sander ½ Sheet	89.50
TR-30	Laminate Trimmer	78.95
TS-251U	10" Miter Saw	189.95
TS-251U	w/accessories	199.95
W630	7¼" circular Saw	99.50
W730	8¼" Circular Saw	109.75

MILWAUKEE TOOLS

0228-1	3/8" VSR Drill	$ 99.95
0234-1	1½" VSR Drill	129.50
0375-1	3/8" Rev. Angle Drill	139.75
1107-1	½" VSR D Handle	147.50
1660-1	½" SSR Compact	174.65
5397	Hammer Drill Kit	177.50
5660	1½ HP Router	142.00
5680	2 HP Router	224.95
5935	4"x24" Belt Sander	219.95
6014	½ Sheet Sander	125.50
6145	4½" Angle Grinder	107.50
6255	VR. SP. Jigsaw	149.95
6287	H.D. Jigsaw Kit	225.00
6367	7¼" Circular Saw	119.95
6460	10¼" Circular Saw	249.75
6507	Sawzall w/case	137.50
6543-1	¼" Screwdriver	137.50
6749-1	Magnum Screwdriver	123.50
6750-1	H.D. Drywall Screwdriver	119.50
6753-1	Drywall Screwdriver	79.95

Rockwell Power Tools

11-072	32" Radial Drill	$ 379.95
22-651	13" Planer	1250.00
28-140	10" Band Saw	349.75
28-243	14" Band Saw	518.50
31-205	8" Table Saw	149.50
33-150	Sawbuck	525.00
33-990	10" Radial Arm Saw	489.95
34-010	Miter Saw	158.95
34-410	10" Contractors Saw	725.00
34-695	10" Homecraft Saw	295.00
34-710	10" Tilting Arbor Saw	474.50
37-609	6" Jointer	295.00
43-122	Wood Shaper	539.95
46-140	11" Lathe	399.95

All Rockwell includes motors

FREUD SAW BLADES

Carbide Tipped 10" = 5/8" Bore, 12" = 1" Bore

No.	Size	Teeth	Use	Price
LU72M10	10"	40	General	$38.50
LU73M10	10"	60	Cut-Off	42.95
LU73M12	12"	72	Cut-Off	76.90
LU78M10	10"	80	Plastic	83.50
LU82M10	10"	60	Cut-Off	48.50
LU82M12	12"	72	Cut-Off	85.95
LU84M10	10"	40	Comb.	42.50
LU84M11	10"	50	Comb.	44.40
LU85M10	10"	80	Cut-Off	72.00
LM72M10	10"	24	Ripping	41.90
TR100	3 blades & Dado set			264.95
DS306	6" Dado			98.95
DS308	8" Dado			119.50

SUN GOLD SANDING SHEETS

9x11 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

Black & Decker Industrial Tools

1165	3/8" Angle Drill	$119.50
1179	3/8" VAR. SP. Drill	69.95
1180	3/8" VSR Holgun®	99.95
1310-10	1/2" VSR Drill	94.50
1311	1/2" VSR Drill	119.75
1575	3/8" VSR Scrudrill®	119.50
1940	3/8" Cordless Drill w/98060 Charger	118.50
1975	3/8" Cordless Screwdriver w/98060 Charger	129.50
2034-10	Drywall Screwdriver	91.50
2054	VSR Screwdriver	155.00
2931	Cordless Screwdriver w/98060 Charger	159.95
3027-09	7¼" Circular Saw	79.95
3030	7¼" Circular Saw	119.95
3034	7¼" Circular Saw	118.65
3035	8¼" Circular Saw	129.50
3051	7¼" Wormdrive Saw	158.25
3091	10" Miter Saw	189.95
3103	2 SP. Cut Sawkit	99.95
3105	VAR. SP. Cut Sawkit	109.50
3107	VAR. SP. Orbital Cut Sawkit	119.50
3123	Port. Band Sawkit	305.00
3141	Cordless Jigsaw w/98060 Charger	149.95
3157	VAR. SP. Jigsaw	129.50
3265	Laminate Trimmer	145.65
3310	1½ HP Router	139.50
3330	1 HP Router	99.95
3370-10	3¼" Planer	129.95
4010	Palm Sander	48.95
4018	½ Sheet Sander	99.50
4247	4½" Disc Sander/ Grinder	69.95
4260	Power File	189.50
6750	Heat Gun	69.75

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Natural, Medium, Dark, Black or Colors
$5.70 Qt. $17.65 Gal

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$5.75 Qt. $12.95 Gal

HITACHI TOOLS

B-600A	14½" Band Saw	$1554.00
CJ65VA	Electronic Jigsaw	132.75
CR10V	Reciprocating Saw	124.75
C10FA	10" Miter Saw	279.00
DRC-10	Cordless Screwdriver	98.50
DR-10	3/8" Drill/Screwdriver	108.00
D6V	¼" Var. Speed Rev. Drill	71.00
D10V	3/8" V Sp R Drill	74.95
D13V	½" Var. Sp. Rev. Drill	99.75
F-20A	3¼" Planer	99.75
F1000A	Planer/Jointer	1375.00
JH-60A	Jig Saw	103.50
P50	6-5/8" Planer	210.00
P100F	12" Planer	1095.00
PSM-7	7¼" Circular Saw	114.95
PSM-8	8" Circular Saw	141.90
SB-110	4x24 Belt Sander w/dust bag	183.00
SO-110A	½ Sheet Sander w/dust bag	119.95
SB-75	3x21 Belt Sander w/Dust Bag	134.75
SB8T	3x24 Belt Sander w/Dust Bag	149.95
TR-6	Laminate Trimmer	92.25
TR-8	1 H.P. Plunge Router	126.95
TR-12	3 H.P. Plunge Router	194.75
W6V	Screwdriver	94.50

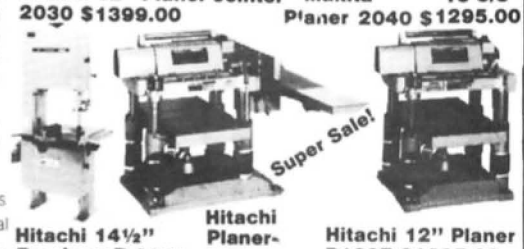
SUNGOLD X-WEIGHT SANDING BELTS

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

Size	Grit	Assortment of 10 $15.95	Assortment of 10 16.95	Assortment of 10 21.95	Outlasts regular
3"x21"	120,100				$.98 ea
	80				1.00 ea
	60				1.05 ea
	50				1.07 ea
	40				1.10 ea
3"x24"	120,100				1.20 ea
	80				1.22 ea
	60				1.26 ea
	50				1.31 ea
	40				1.34 ea
4"x24"	120,100				1.68 ea
	80				1.73 ea
	60				1.78 ea
	50				1.85 ea
	40				1.89 ea

Size	Grit	Outlasts regular
3"x21"	120,100	$.84 ea
	80	.86 ea
	60	.92 ea
	50	.94 ea
	40	.97 ea
3"x24"	120,100	.93 ea
	80	.97 ea
	60	1.12 ea
	50	1.15 ea
	40	1.18 ea
4"x24"	120,100	1.46 ea
	80	1.51 ea
	60	1.64 ea
	50	1.70 ea
	40	1.76 ea

Free Stand! **Free Stand!**
Makita 12" Planer-Jointer 2030 $1399.00 **Makita 15-5/8" Planer 2040 $1295.00**



Hitachi 14½" Bandsaw $1554.00 **Hitachi Planer-Jointer B-600A F1000A $1375.00** **Hitachi 12" Planer P100F $1095.00**

Super Sale!

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Model	List	Our Price	Rebate	Your Net Cost
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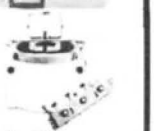
1180 3/8" Drill	144.00	99.95	10.00	89.95
1575 3/8" Scrugun	169.00	119.50	10.00	109.50
3030 7¼" Circ.	155.00	119.95	10.00	109.95
3051 7¼" Wormdrive	232.00	158.25	20.00	138.25
3103 Cut Saw	163.00	99.95	10.00	89.95
3105 Cut Saw	170.00	109.50	10.00	99.50
3107 Cut Saw	183.00	119.50	10.00	109.50
4010 Palm Sander	80.00	48.95	10.00	38.95
4247 Disc Grinder	102.00	69.95	10.00	59.95

FREE CATALOG WITH ORDER OR BY WRITING TO POST OFFICE BOX.

NEW!



Makita ½" 3 H.P. Plunge Router 3612BR $189.95 **Makita 16" Circular Saw 5402A $395.00** **IT'S BACK! Blade Sharpener** Blade Holder **$39.95**

NEW!

NEW!

Makita Palm Sander B04510 $46.95 **Makita 6" Round Palm Sander B04530 $52.95** **Makita 8¼" Circular Saw 5008NB $105.00**

Grandfather Clock, see page 50.

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

The Woodworker's Journal

VOLUME 8, NUMBER 5
SEPTEMBER/OCTOBER 1984

DEPARTMENTS

PROJECTS

Shoptalk

A Big Project

For several years I've wanted to include plans for a classic 18th-century style grandfather clock in *The Woodworker's Journal* but, as is generally the case with such a complex project, I've been inclined to feel a bit uneasy about devoting a large number of pages to a project that perhaps only a small percentage of readers would undertake. But then I had the same misgivings about the roll-top desk we did back in 1979. Since that proved to be a very popular project, I've come to the conclusion that a great many readers are both willing and able to tackle the more challenging projects.

Presenting this clock was a fair challenge for us also. The starting point was a set of plans submitted to us by Roy B. Cook. In order to prove out the accuracy of the plans and the suitability of the joinery, it was obviously necessary for us to build the clock. Nearly one hundred and thirty hours of shop time (not including jig design) and $750.00 in materials went into the construction of the prototype.

Probably the most difficult job was the joint efforts of the shop, art and editorial departments to convert the original blueprints and instructions into a presentation that would cover each step of the construction as clearly as possible.

Because of the many pages needed to present the clock article, it was necessary for us to divide the project into two parts. The second installment, which concerns the upper case construction and movement installation, will appear in the next issue.

The clock now graces our reception area and we are all very proud of it. Of the hundreds of projects we've built over the past eight years, it stands, both literally and figuratively, head and shoulders above anything else.

I hope that many of you will undertake the building of this elegant piece. Taken one step at a time, it is a time-consuming but not overly difficult project. If you have any questions concerning the construction, please remember that our staff stands ready to assist you. Just call or drop us a line.

Binders....At Last!

In the January/February 1984 issue, I promised that a binder system for back issues would be forthcoming as soon as possible. After considering many binder systems we have finally made arrangements to furnish our readers with their choice of either a binder (which will hold issues without having to punch holes in them) or a slip case. Whichever you choose, I'm sure you'll find them both handsome and durable. Ordering information can be found on page sixty-three.

Jim McQuillan

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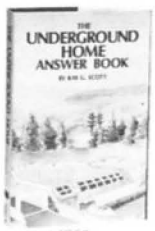

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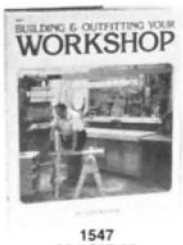

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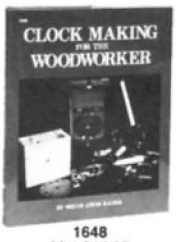

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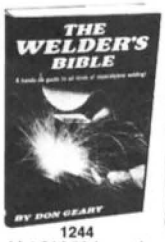

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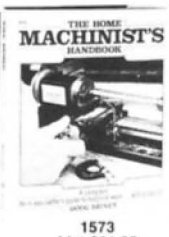

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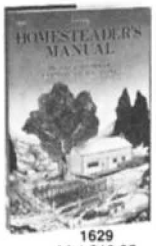

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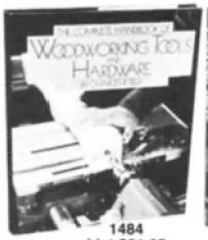

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1610
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WWJ-984

Letters

I need to know how to repair a "bubble" (sometimes called a "blister") that has formed near the center of a veneered top. I guess it was caused by high humidity when I refinished it outside under my porch.

L.F. Swoope, Sulphur, La.

In an environment of high humidity, veneer will take on a lot of moisture, causing it to expand. If, under the expanding veneer, there is a spot where little or no glue was applied, or an area where it was inadequately rolled, a bubble is likely to form.

To repair the bubble, use a sharp knife or single-edge razor and make two cuts (parallel to the grain direction), one on each side of the bubble. Using the point of a sharp knife, work fresh glue into the opening formed by each cut, taking care not to further split the veneer. A glue injector, a tool that's much like a big hypodermic needle, is ideal for a job like this. One can be purchased from: Constantine, 2050 Eastchester Road, Bronx, New York 10461.

Wipe away any excess glue, then apply clamp pressure. A scrap piece of wood will protect the veneer when clamp pressure is applied, and a piece of wax paper will keep the scrap wood from sticking to the glue. If a clamp won't reach the repair area, place a few heavy books on top of the scrap wood.

. . . I've found that wire reels (the kind the electric utilities receive wire on) make excellent workbenches. They are especially handy for staining, varnishing, or stripping a piece. Their circular shape makes it easy to work your way around a project, and when you've finished the job, they can be flipped on edge and rolled out of the way. And perhaps best of all, they are usually free for the asking.

David Honbarger, Jr.,
Salisbury, N.C.

In his article on restoring hopeless cases (January/February 1984, page 19) John Olson warns of hidden nails and the use of a sharp awl to locate them.

I find that I can remove such hidden nails (with a minimum of damage to surrounding wood) by drilling a 3/32 in. diameter by ¼ in. deep hole on each side of the nail. Then, to pull it out, I use a good quality, medium-size needle-nose pliers. Once pulled, the holes can be filled with a wood filler.

Percy F. Hanson,
Walhalla, N.D.

I am having difficulty locating brass bed bolt covers. Can you suggest a source?

L.M. Waechter,
Columbia, Ohio

The Wise Company, 6503 St. Claude Ave., Arabi, LA 70032 sells a bed bolt cover measuring 1⅝ in. diameter.

Editor's Note: John Olson, who writes our Restoring Antiques *column, was*

kind enough to help us with the next letter.

Our small Baptist church has 18 solid oak pews, each one 10 feet long. They are over 35 years old, in fact, most of them are broken in more than one place. To replace them would cost $15,000 to $20,000, which the church can't afford. I have started hand scraping them, and gluing and doweling them where necessary. The varnish is very hard to scrape off and regular strippers cost too much. I recently tried an old-fashioned stripper mix of lye and cornstarch but it turns the wood dark and now I will have to bleach before I can go any farther. Any suggestions you might have for refinishing the pews would be a great help.

D. Ray Hungate,
Las Cruces, N. Mex.

For a surface that gets a lot of wear such as pew seats, a clear hard finish is best — either polyurethane or an acrylic. The beauty of this type of finish is that it can be renewed time and again without stripping and refinishing. The trick is to use a very fine sandpaper and remove about as much finish as you will apply. However, initial preparation is very important. The final finish will be no better than the surface to which it is applied. Oak is highly porous and should be filled to obtain satisfactory results. The filler should be mixed with enough stain to make a fluid with the approximate thickness of a very light coffee cream (half and half). Apply this mixture with a very stiff bristled brush working across the grain. Allow to become dull (about 25 minutes or so) then wipe off across the grain with a coarse textured rag such as burlap. Be careful not to remove the filler from the pores of the wood. Let dry at least 24 hours. If the resulting surface isn't satisfactory it may be lightly sanded to remove excess filler and further smooth the oak surface. If this sanding step is used it will be necessary to restain the wood. Then apply at least three (preferably four to five) coats of clear finish.

Your March/April 1984 issue featured a Rocking Horse on page 50. The basic idea is good, and any youngster would get a real kick out of having such a toy, however, I feel there is a design flaw that should be pointed out. The carved ear, which comes to a fairly sharp point, can cause injury to a child — something I found years ago when I made a rocking horse with ears much like the ones you show. While rocking hard one day, my son lost his balance and knocked out a tooth on the protruding ear. Fortunately, the damage was not permanent, although it was plenty painful. To be on the safe side, it's best to make the ears from vinyl or leather scrap.

Don Kinnaman, Phoenix, Ariz.

A dimension needs to be clarified on the Folding Deck Chair plans featured on pages 26 and 27 of your May/June 1984 issue. On the drawing grid pattern, the outside leg is shown as 44 in. long, yet there are only 43 of the 1 in. grid squares. Which is correct?

Charles M. Parker, Greenville,S.C.

Sorry for the confusion. The correct length is 43 in.

(continued on next page)

Letters, (Cont'd)

In your "Letters" section of the July/August 1984 issue, you informed readers to write to The Consumer Product Safety Commission for safe standards regarding toy construction. However, you failed to list their mailing address and the cost.

Roger Szeszulski, Midland, Mich.

For a copy of their Regulations for Toys and Children's Articles, *write to The Consumer Product Safety Commission, Washington, D.C. 20207. The information is available at no charge.*

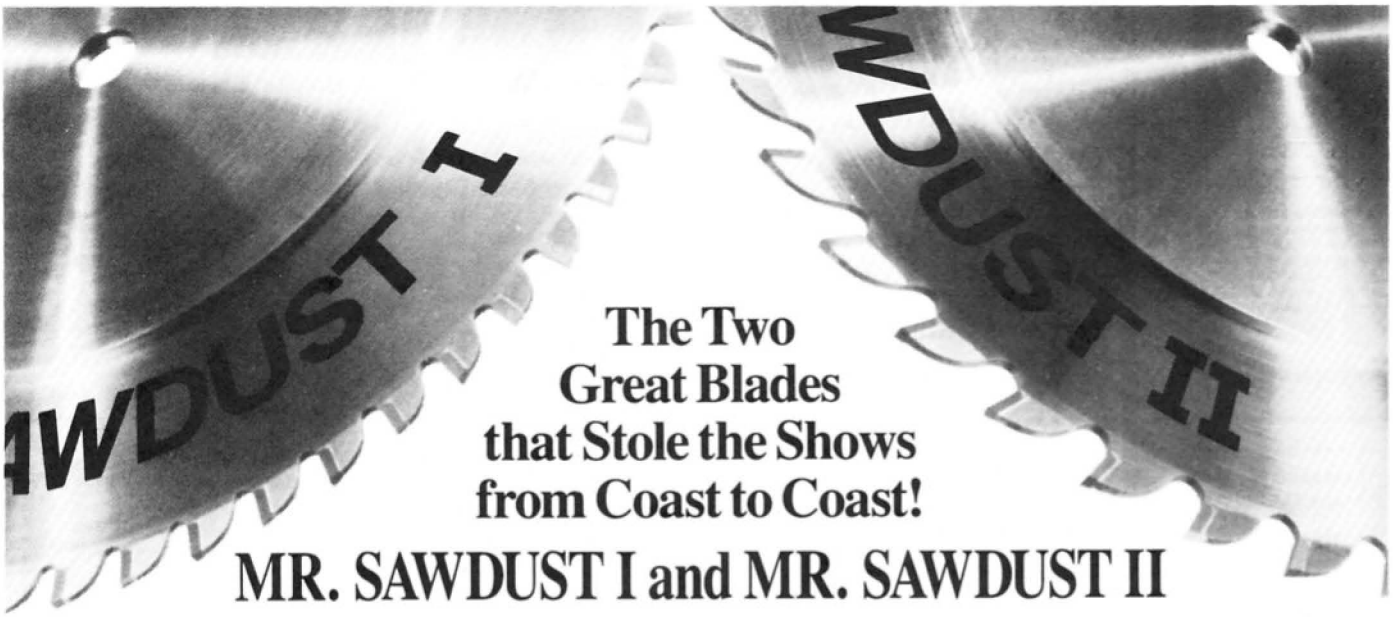
Odds and Ends

On September 28th, 29th and 30th, at the Westfield Armory in Westfield, New Jersey, the Garrett Wade Company and Force Machinery will present Woodworking: Tools of the Trade '84, a hand and power tools exposition for amateur and professional woodworkers. Demonstrations and exhibitions will be held continuously, and scheduled seminars will cover European construction techniques, dovetail joinery, traditional Japanese woodworking, Windsor chairmaking, and fifty years of woodworking machinery. Admission to the exposition is $5.00 per person. Seminar fee is $10.00 per person. Seats for the seminars must be reserved by calling the Garrett Wade Company at (212) 807-1155.

The Woodworking Association of North America (WANA) has a couple of upcoming shows. Woodworking World — The Chicago Show, will be held at the O'Hare Expo Center in Rosemont, Illinois on October 12-14, while Woodworking World — The Philadelphia Show, will be held at the George Washington Lodge in King of Prussia, Pennsylvania on November 9-11. Admission fee will be $5.00, and seminars are free with admission. For show or seminar information, contact: WANA, 35 Main Street, Suite 6, Plymouth, NH 03264. Telephone: (603) 536-3876.

The Woodworking Show for Craftsmen and Hobbyists will be held on September 28-30, at the Orange County Fairgrounds in Costa Mesa, California. It will feature over 100 exhibits of the latest tools, techniques, and supplies. Seminars are free and door prizes will be awarded. For more information, contact: Patricia Dillon, The Woodworking Show for Craftsmen and Hobbyists, 1516 South Pontius Ave., Los Angeles, California 90025. Telephone: (213) 477-8521.

Albert Constantine and Son, Inc., 2050 Eastchester Road, Bronx, New York will hold a Wood and Tool Expo on November 16 and 17. Admission is free. Qualified representatives of manufacturers of woodworking tools and supplies will be on hand to demonstrate their products and to answer questions. Experts in marquetry, woodcarving, and general woodworking will demonstrate their crafts. Also, a representative from a famous veneer mill will show veneer and talk about its use. For more information, call Constantine's at (212) 792-1600. WWJ



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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.

Does any reader have information on a Sears Craftsman push-pull 10 in. table saw model no. 109-22620? This saw may have been manufactured around 1947 just after the war. Any information would be greatly appreciated on locating the owner's manual and parts list and I will pay for any photocopying and mailing costs.

Richard M. Hunter
8323 N. 10th Ave.
Phoenix, AZ 85021

I hope one of your readers can help me. I have a Shopmate industrial listed orbital sander, model no. 1800-type 1. I would like to know if the company is still in business. I have this address: Portable Electric Tool Co., Geneva, IL 60134. I wrote to them and got my letter back stating forwarding address expired.

Marion W. Sulenski
1192 Richwine Dr.
Williamsburg, VA 23185

I am looking for plans/information to build a Chinese puzzle box — the type that has all those interlocking catches which need to be undone in order to open the box.

Richard M. Shields
P.O. Box 416
Mesilla Park, NM 88047

I am looking for a new or rebuilt motor for a 1964 Sears 9 in. radial-arm saw, motor no. 90-0723, model no. 103.29310. My motor burned out and Sears has discontinued this model.

James Loyd
2209 Hollywood
Muncie, IN 47304

I recently acquired a Sears Craftsman table saw model no. 113-22401. Sears no longer carries a manual for it. If anyone has a manual for it, I would be willing to pay for photocopying and postage.

C. Soldan
543 N.E. 3rd
Gresham, OR 97030

I am looking for the original parts list and manual for an 8 in. Sears Craftsman table saw model no. 103.22160 manufactured by King-Seely Corp. around the mid 50's. I will reimburse any costs incurred.

John Kasey
14 Taylor Ave., Apt. 2C
South Norwalk, CT 06854

I have an old Craftsman lathe model no. 101.07301, serial no. 6L030786. The local Sears has the parts list on microfilm but no manual of instructions. Can any of your readers help with the latter?

William C. Fletcher
2425 Highland Road
Upland, CA 91786

I have procured a 24 in. throat Craftsman jig saw model no. 103.23440, manufactured by King-Seely Corp. Our problem is how to tighten the blade assuming all parts came with the jig saw. If anyone can provide the know-how or has a copy of the manual, I'll gladly reimburse all costs involved.

Paul L. Eikenberry
5311 Staughton Drive
Indianapolis, IN 46226

I have noticed that all the suppliers of toy wheels have exactly the same wheels for sale. This indicates to me that some firm must make a tool for forming these wheels. Do you know of any company which makes a tool such as this to use on a drill press?

Norman A. Vining
895 Main Street
Wilbraham, MA 01095

Would you ask your readers if anyone has a copy of a manual and/or parts list for a Sears jig saw, model no. 103.23151. I'd pay for the copy.

L. Murray
7308 E. 10th
Spokane, WA 99212

Workshop Income

Starting a Business: Part 1

As we have noted before in this column, rare indeed is the hobby woodworker who has not, at one time or other, considered the possibility of transforming his hobby into a business. Many of our readers have indicated that they do in fact derive some income from their woodworking craft, and many others have expressed a serious interest in starting a full-time business. In response to their questions we have decided to take a closer look at the subject.

There are, of course, many degrees of involvement — from the full-time production woodworker to the retired part-time hobbyist. Since there is little, if any, risk for the hobby woodworker who occasionally sells a piece, we decided to concentrate on the problems facing those individuals who are seriously considering a switch to woodworking as a career or full-time business. We asked professional woodworkers who have successfully made the switch to share with us their experiences, suggestions, pitfalls, opinions, and plain old thoughts. In the course of researching this article we also interviewed businessmen and officials at the Small Business Administration.

The results of our inquiries offer, we believe, a frank look at what is, by all accounts, a most complex subject. Indeed, the scope of information we garnered was so broad that we have divided it into two features. This, the first feature, will offer an overview of the problems and considerations that one should be aware of when starting a woodworking business. The second feature, in our November/December issue, will examine specifics, from what tools to equip a shop with, to the best location for a woodworking business.

First, some sobering statistics. The Small Business Administration (SBA) tells us that 60% of small businesses fail after only one year. After three years this figure rises to 70%, and by the end of five years, fully 80% of small businesses will fail. The SBA strongly recommends that you consult with an SBA counselor *before* you make any firm plans. The SBA has counselors at offices throughout the country, and SBA officials conduct seminars geared for the individual who is considering starting a small business. You may contact the SBA through your local Chamber of Commerce.

The SBA also sponsors a Service Corps of Retired Executives (SCORE) whose volunteers offer free counseling, management advice and workshops for small businessmen. These retired executives are especially skilled in problem solving. Write to or call, SCORE National Office, 1129 20th Street N.W., Suite 410, Washington, D.C. 20416. Telephone: (202) 653-6279.

Although the woodworkers we spoke with each had a different story, many of the problems and challenges they faced were similar. All agreed that success depended on the right combination of financing, equipment, timing, marketing, location and skill. Other intangible, but no less important factors were motivation, experience, determination and a healthy measure of old-fashioned luck.

The woodworkers we surveyed shared certain opinions and conclusions that we feel are especially significant. There is, they all pointed out, a world of difference between being a hobby and a production woodworker. As a production woodworker you will be breathing sawdust all day, and often laboring long hours at repetitive tasks. Unless you are independently wealthy, are an artist-craftsman who commands thousands of dollars for his work, or are able to work

on a commission-only basis, you will be working very hard to maintain even an average standard of living. You will almost certainly never get rich. To better experience what it is like, the woodworkers surveyed strongly suggested spending some time working in a shop, or at the very least observing how a production shop operates.

Although the woodworkers we surveyed stressed the need to realistically approach the question of starting a business, they also pointed out the rewards. The satisfaction of creating something, the pride when your work is recognized and appreciated, the love of wood, and the gratification of doing something that you enjoy, were all listed as important to the woodworkers we surveyed.

To succeed with a full-time woodworking business requires sacrifice. You will need to make things that are not only competitively priced, but saleable. The woodworkers we surveyed said that it is nearly impossible to make toys on a competitive basis in a small shop. Inexpensive imports from countries such as Taiwan and Portugal make it especially hard for the North American woodworker to compete. Since woodworking is by nature so labor-intensive, the successful domestic woodworker must find a "niche"; he must create something that fills a consumer need and yet is not also produced in a low wage foreign country. There are many skilled American toymakers, yet nearly all are part-time or retired persons who do not depend on their craft as a primary source of income.

Most working woodworkers recommend making furniture. Tables and beds are the least labor intensive projects, and therefore offer the best chance for turning a profit. Chairs are generally more labor intensive, and several woodworkers made the point that manufacturing chairs is definitely *not* the best way to start a woodworking business.

It is important to establish a firm market base early on. It is equally important to match your product with your skill level. Every woodworker is certainly not a flamboyant artist, and one woodworker we surveyed even recommended starting out with the very simplest 2 x 4 style lawn and garden variety furniture, that can be easily sold through local hardware and department stores.

There are many ways to start a business, and many paths to success. Finding the direction that is best for you will likely be a process of trial and error. Take advantage of opportunities, use ingenuity and creativity, *and* temper your enthusiasm with common sense.

The full-time professional woodworker must have a dedication and commitment that go beyond what many amateurs describe as their "passion for wood." The professional's respect for and appreciation of wood and woodworking runs far deeper: it is a "feeling," an experience, a pride. Indeed, medieval woodworking fraternities ascribed magical qualities to certain woods, and attributed mystical powers to those artisans who were masters of their art.

Twentieth-century woodworkers know, of course, that success is grounded in a firm foundation of knowledge, planning and preparation. Still, starting up a woodworking business often requires something of a "leap of faith."

The woodworkers we queried were all people who, at one time or another, were locked into jobs they disliked. More importantly, however, they were individuals who measured success not with a dollar sign, but in terms of personal satisfaction. They spoke of their regard for quality, their sense of heritage or history, and the challenge in creating something lasting, useful, and possibly even beautiful.

At the very core of their experiences, they all agreed, is the fact that they are constantly renewed and rejuvenated by their work. It is a feeling, they revealed, that although hard to measure, is even harder to beat. WWJ

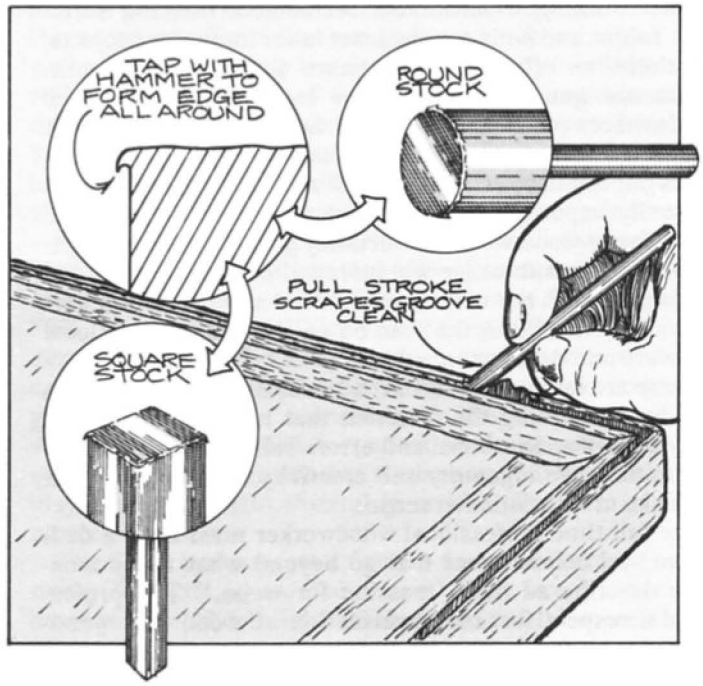
Restoring Antiques

Applying Filler

By John W. Olson

For several issues now, I've been discussing how to strip and clean furniture in preparation for refinishing. In this issue, I'll talk about how to apply filler and also how to select a final clear finish.

Before starting though, I'd like to mention a couple of tricks of the trade that I use when stripping and cleaning a piece. Flutes, grooves, and various kinds of small carving are common to many furniture styles, and these odd shapes can be very difficult to clean when you are forced to use the run-of-the-mill tools found around the workshop. In order to do a really satisfactory job, I've found that a few homemade tools will make the entire process a lot easier.



For cleaning grooves, a simple hook scraper can be made in a few minutes. Select a piece of steel rod that has a diameter equal to the groove to be cleaned, then cut both ends square. With the rod held vertically in a vise, use a hammer to gently tap around the circumference, rolling over the edge until you can just feel the wire edge being formed.

Give the tool a try. If it seems to need more work, roll over the edge just a little more and then dress it with a very fine file. A needle file, either flat or triangular, does a good job. The scraper works best when used with a pull stroke.

As shown on the sketches, other shapes can be made. Square or rectangular steel stock makes a good scraper for small corners or along the edges of small, straight square beads.

Once all the surfaces of the piece are clean and smooth, you'll need to decide whether or not you want to fill the pores of the wood. This step may not be necessary if the

wood is open-grained and it has been sanded with very fine sandpaper. Unfortunately, most old hopeless cases have undergone so much restoration and edge-rounding that there is no other choice. If the wood is open-grained, it must be filled. This being the case, check the surface again. Sand as smoothly as possible, going through the various grades of sandpaper step-by-step. Begin with a 100 grit garnet or aluminum oxide paper, then go to 120 and 140, before finishing up with 180. Brush the surface well to remove all wood dust from the pores. Even better, use a vacuum cleaner or a stream of air from a compressor equipped with a blower attachment.

Next, prepare the filler. If the piece is being stained, the filler should be diluted with the stain to a viscosity of thin coffee cream (half-and-half). I find that most amateurs err on the side of preparing too thick a mixture. The filler should pour and spread easily with no lumps or thick drops. Apply the mixture with a stiff bristled brush, working across the grain with a scrubbing-like action. A 1-1½ in. wide stencil brush, the kind used to ink through metal letters, works well. The intention is to pack the wood pores full of filler, therefore some excess left on the surface is unavoidable.

Allow the filled surface to become dull but not quite dry then remove the excess filler with a coarse textured rag such as monk's cloth or burlap. Scrub across the grain, further packing the filler into the wood pores. Be careful not to remove the filler from the pores as this is very easy to do at this stage, especially when stroking parallel to the grain while using a circular motion. A straight back and forth motion across the grain is best.

Allow the filled surface to dry and set up for at least twenty-four hours. If quite a bit of the dried filler stain mixture is left on the surface (and this is commonly the case) it can be removed by gently sanding with fine paper. However, it is imperative that the filler be absolutely dry before sanding. The back of the sandpaper will build up a layer of filler and this tends to drag the filler from the pores as you sand parallel to the grain. If this happens, you'll be faced with restaining the surface. Here again, be careful not to drag the filler from the pores if the stain is applied with a rag. Some of the solvents used in stains may soften the filler and make it easy to remove. Apply the stain sparingly with a very soft bristled brush and then gently remove the excess with a soft cloth. Allow at least twenty-four hours before applying the final clear finish.

The choice of material is important and only quality products should be used. Stick to the well-known proven brands such as Minwax and Benjamin Moore. These are two of my favorites. Moore's house brand is Benwood, and their Benwood One Hour Clear Finish is one of the easiest to apply of all the finishes that I have tried. It flows and levels almost immediately, and dries to the touch in an hour or less. It can be recoated in approximately three hours, which means a three-coat job can be completed in one work day. Further, it is highly scratch and alcohol resistant.

The stains made by Benwood are also good, but my favorite brand is Minwax, which acts as both a stain and a sealer. I like the fact that Minwax stains are color compatible, which means their colors can be mixed to create almost any hue. Also, it is compatible with most other brands of clear finishes. Although I generally use Benwood clear finishes, I have experimented with other brands and have found all of them to work well with Minwax.

Next issue, I'll talk about applying the clear final finish.

WWJ

The Beginning Woodworker

by Roger Schroeder

Building a Basic Workbench

Last issue, in this column, I discussed the basic hand tools that I feel a beginning woodworker needs in order to get started. Equipped with these tools — the panel saw, plane, hammer, bit brace, try square, tape measure, sharpening stone, chisels, screwdrivers, and files — a beginner will be able to take on a wide variety of projects.

Before actually starting on a project, however, there is one more "tool" that will be needed — a sturdy workbench. While a novice may not think of a workbench as a tool, an experienced woodworker will tell you that it is, and an important one at that. In this issue, then, I'll discuss how to construct a sturdy workbench; one that can be made using those basic hand tools, and one that can be expected to provide many years of service. The plans are shown on page 21.

A ready-made workbench can be a large investment and may not meet your needs in terms of size. Assuming, then, that you are not going to start in right away by making period furniture reproductions, I've designed a bench much like the first one I built for myself. It has several advantages. First, it is cost effective since it can be built for around $60. Second, it is a good project to help you get acquainted with hand tools that you should have purchased as a beginning woodworker. Third, it can handle as much carpentry as it can cabinetmaking, the former being the way most of us start out. Yet, as I will describe at the end of the column, it can be adapted to more sophisticated woodworking.

The first consideration when building a bench is size. My advice is, if at all possible, to make the room for the bench rather than to build an undersized bench for that corner of the garage or basement that somehow got spared of garden equipment, snow tires or unused furniture. If you get hooked on woodworking, you'll likely discover that you are soon undertooled and your equipment is too limited for all the projects you'd like to plan.

My bench measures 60 in. in length, 24½ in. in width, and 36 in. in height. Its components are obtainable at any lumberyard. One is the common construction lumber called hemlock or fir found in nearly all house frames. Another is called tempered hardboard (Masonite), a dark composite material of wood fibers found as cabinet backing and drawer bottoms. The tempered variety is extra strong and stiff, and it will last a long time. My first workbench has had the same hardboard for fifteen years, and it still shows no signs of needing replacement. The only other material you'll be needing is a pound of 10 penny nails (which measure three in. in length), and a box of 1 in. finishing nails.

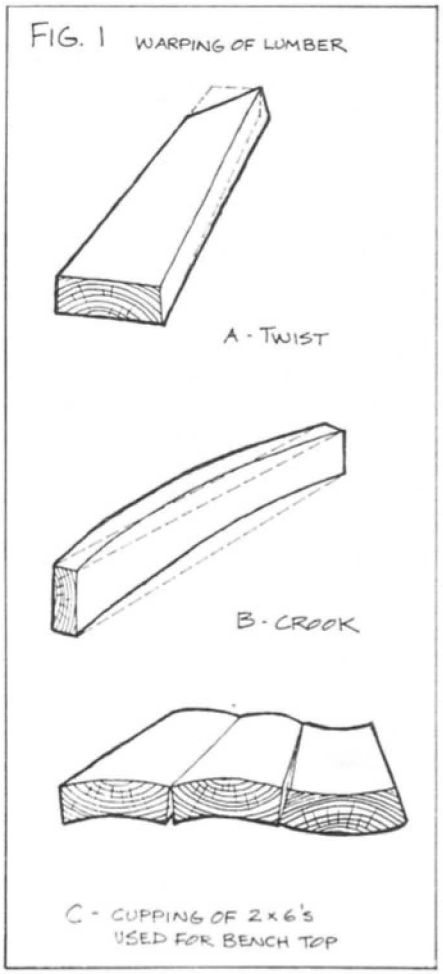
Though you are not limited to the five-foot length, you should not have a bench wider than two feet, since it becomes impractical in terms of floor space and, of course, it becomes difficult to reach for things. I chose this length not only for its convenient size, but also because the combined measurements make use of a standard 8-foot length of building material with very little waste. This bench, then, comprises nothing more than common 2 x 4 stock. Twelve pieces, each 8 feet long, are all that you will need.

When buying hemlock or fir 2 x 4's, you will probably be taken out to the back of the lumberyard to an uncovered pile of wood. At best, the pieces will be wet to the touch. In the winter, they are likely to be frozen together. But at worst, they will be soaked. An 8-foot 2 x 4 can hold up to four quarts of water. What you end up with, then, is useless extra weight, and you are taking the chance of the lumber twisting as it dries out, a problem that will be discussed in a future column. What is needed is lumber that has been kept indoors and is dry.

Still, you should check each piece by lifting up an end and noting that the board is not twisted (Fig. 1A). Another problem, though not as serious, is crook (Fig. 1B). Both problems are common to lumber and will leave the top of your bench with gaps or a wavy surface. Still another difficulty with lumber is cupping. That is why I do not recommend larger 2 x 6 boards for the

top, since this problem is more common with that size (Fig. 1C).

I suggest fir or hemlock for several reasons. First, they are strong. After all, it's the same wood used to hold up



most houses. Second, when dry, fir and hemlock are surprisingly lightweight, and this makes them easy to manage. And, when using hand tools, fir and hemlock are easier to work than a hardwood such as maple, a wood used in many professional quality workbenches.

Also, be aware that 2 x 4 stock does not measure 2 in. thick by 4 in. wide. The rough lumber starts off this size, but is planed at the mill to 1½ in. x 3½ in. This is why the top measures 24½ in. wide, because seven pieces of 1½ in. x 3½ in. laid edge-to-edge equal this odd dimension.

Another thing to be careful of is that you are not sold pressure-treated lumber. Used mostly for outside construction of decks, its greenish coloration comes from the chemical treatment that makes it more rot-resistant than the untreated kind. It is not necessary for a workbench, and it costs more.

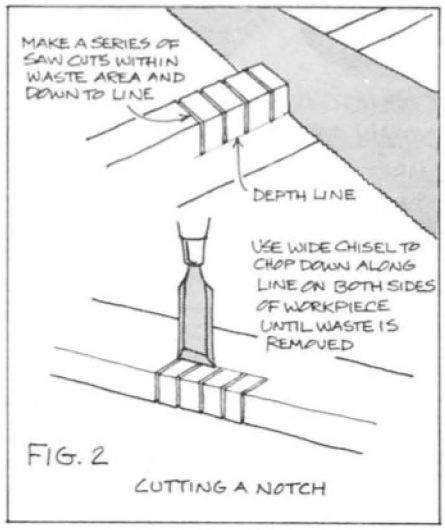
The tempered hardboard you will need for the top and shelf comes in ¼ in. thick 4 x 8 foot sheets. Though it may cost a dollar extra, having it cut to size by the lumberyard would be of help and would make the two smaller pieces more manageable than the larger one.

With your materials in hand, the next step is cutting the 2 x 4's to size (see bill of materials). Realize that there is a logical and efficient way to saw them. Two legs (A), and one side rail (B) roughly equal 8 feet, the length of one 2 x 4. Two front or two back rails (C) also equal 8 feet. One piece for the top (F), plus a cross member (D), can also come out of a single length of 2 x 4. Cutting the pieces to size this way eliminates waste.

The measuring tools most useful are the retractable tape measure and the try square, the former giving you the lengths needed, the latter giving an edge to draw a line across the board. Cutting the pieces can be accomplished with a 10-point crosscut saw. Know, when using the saw, that 75% of the cutting is done on the downstroke.

When all the pieces are cut to size, with the brace's ends left square for the time being, it would be a good idea to label them. A charcoal pencil will work well here.

The next step is to cut the notches into the legs, done to make the framework more rigid and less wobbly. Laying out the notches can also be done with that try square and tape measure. They all will measure 3½ in. wide and 1½ in. deep with the bottom notches being 12 inches from the floor. The top notches of each leg can be sawn out with the handsaw, but the notches used to accept parts B are cut out with a hammer (or preferably a wooden



mallet) and chisel.

First, lay out the lines on the two faces and one edge of the leg where the wood is to be removed. Using the

(continued on next page)

handsaw, cut down 1½ in. into the leg from the edge. Now the widest chisel you have will come into use to remove the wood. One trick in chiseling through a board is to cut in on both sides of the wood. A quarter inch of depth is all that is needed on one side. This will keep the wood from being chipped away as the chisel finally goes through from the other side (Fig. 2). If you've purchased a rasp, which is a coarse file, you can use it to clean up any irregularities left by the chiseling.

With the legs notched out, they should be assembled with their rails. A nailing trick used by carpenters is to hammer the nails into the rails until just their points show through the wood. This makes nailing much easier, especially when holding boards together is awkward. You can also put the try square to use again by checking with it to insure that the rails and legs are at right angles (Fig. 3).

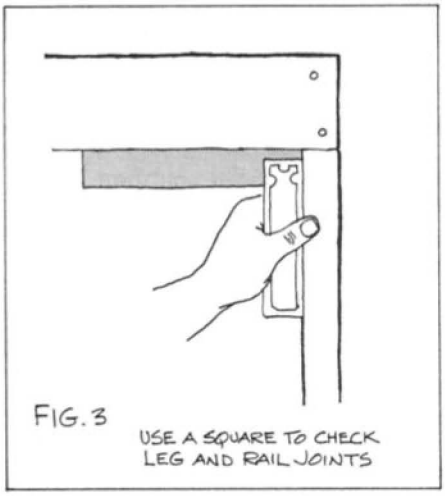


FIG. 3
USE A SQUARE TO CHECK LEG AND RAIL JOINTS

I might note that screws and even bolts have been used for assembly, but nails have held my bench together with no problems, though every couple of years I give them a few raps with the hammer to tighten up the joints.

With the sides assembled, you must join them with the front and back rails (C). Because the sides have to be laid on one edge, it would probably be best to lean each against a chair while you are nailing one pair of parts C into place. The framework can then be turned over and the other pair of rails can be nailed to the inside of the legs.

Nailing the rails (C) on the inside rather than the outside of the legs serves a couple of purposes. For one, it allows for a shelf (H) to be put into place easily without a lot of cutting out to get around the legs. But it also leaves a slight overhang of the top that can be useful when it comes to clamping small pieces to the bench with C-

clamps or wooden clamps called hand screws.

A larger clamp will be needed, however, when attaching the cross members, parts D, which give support to the top and to the shelf. These should be spaced so that they divide the framework into three equal spaces. A pipe clamp laid across the top of the front and back rails, but to one side of the cross member, will hold it until you

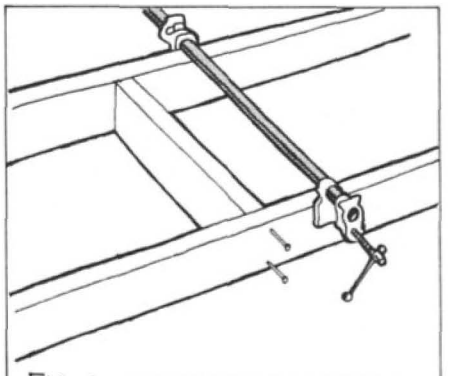


FIG. 4 CLAMPING RAILS HELPS WHEN NAILING THE CROSSMEMBERS

can drive nails through the rails (Fig. 4). Another trick would be to cut parts D last so that you can make them ⅛ in. longer than the opening between the rails. They can then be hammered into place and nailed from the outside.

The brace (E) in the rear of the bench lends rigidity to the frame, especially when you are putting stresses on it from either end. But attaching it takes special consideration since its ends are not square. I made its length longer than need be so you could have some extra wood to work with when laying out the lines to be cut.

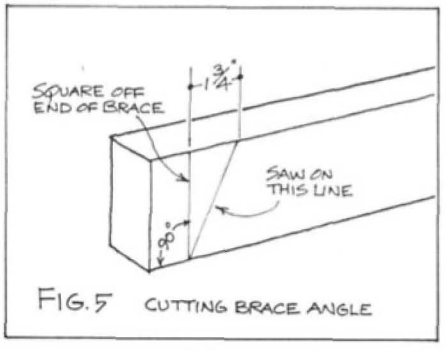


FIG. 5 CUTTING BRACE ANGLE

For cutting the brace to size, I've worked out a strategy that should be of help. First, cut one end with the saw after laying out a triangular area with the try square that measures 1¾ in. x 3½ in. (See Fig. 5). Before cutting the other end, hold the brace up to the space between the legs as best you can. This way, you can see where the contact point will be where the other end of the brace and leg meet. There

(continued on next page)

you can mark with a pencil a line indicating the profile of the leg along the face of the brace. If you held the piece correctly, that line should be fairly accurate for cutting the angle.

Putting the top into place comes next. Here you may want to use screws for securing parts F to the cross members and side rails, but nails will work. I would put two nails in at each of the four points of contact with the cross members and rails.

Before attaching the hardboard top, check the surface of the top boards with a straight edge at least two feet long. Even the best 2 x 4's may not leave a truly flat surface, and now is the time to find that out. If you can see light under the straight edge or if it rocks back and forth, you should plane off the high spots. A jack plane will do the job, and it's a good introduction to this tool. But first you will have to countersink those nail heads at least ¼ in. below the surface of the boards so the plane iron doesn't hit them.

What is left is the shelf and top surface. Finishing nails, 1 in. long, will hold them secure. If the shelf is a bit too wide to slide in between the legs, the jack plane can be used to trim an edge. For the top, the nails should be sunk with a nail set at least ⅛ in. below the surface. This measure will keep the steel of plane blades and chisels from getting nicked. For both pieces, make sure the smooth side of the hardboard is up.

As you get more involved in woodworking, you will find a greater need for clamping devices. A bench vise is a good investment, and one attached to the front and to one side would be useful. What will have to be done, though, is to remove a portion of the top front rail to accommodate the vise's spindles and screw. This can be done, if the top has already been attached, with a bit brace and a sizeable auger bit. Overlap the holes slightly and remove the excess with the chisel.

Many hardware stores carry bench vises, but if you cannot find one, you can purchase a fairly decent vise from Fine Tool Shops, Inc. for about $20. Order number 300-0165. A toll-free number is 1-800-243-1037. This one will fit nicely to your now 1¾ in. thick top and is held with screws. That set of screwdrivers you should have bought will come in handy here.

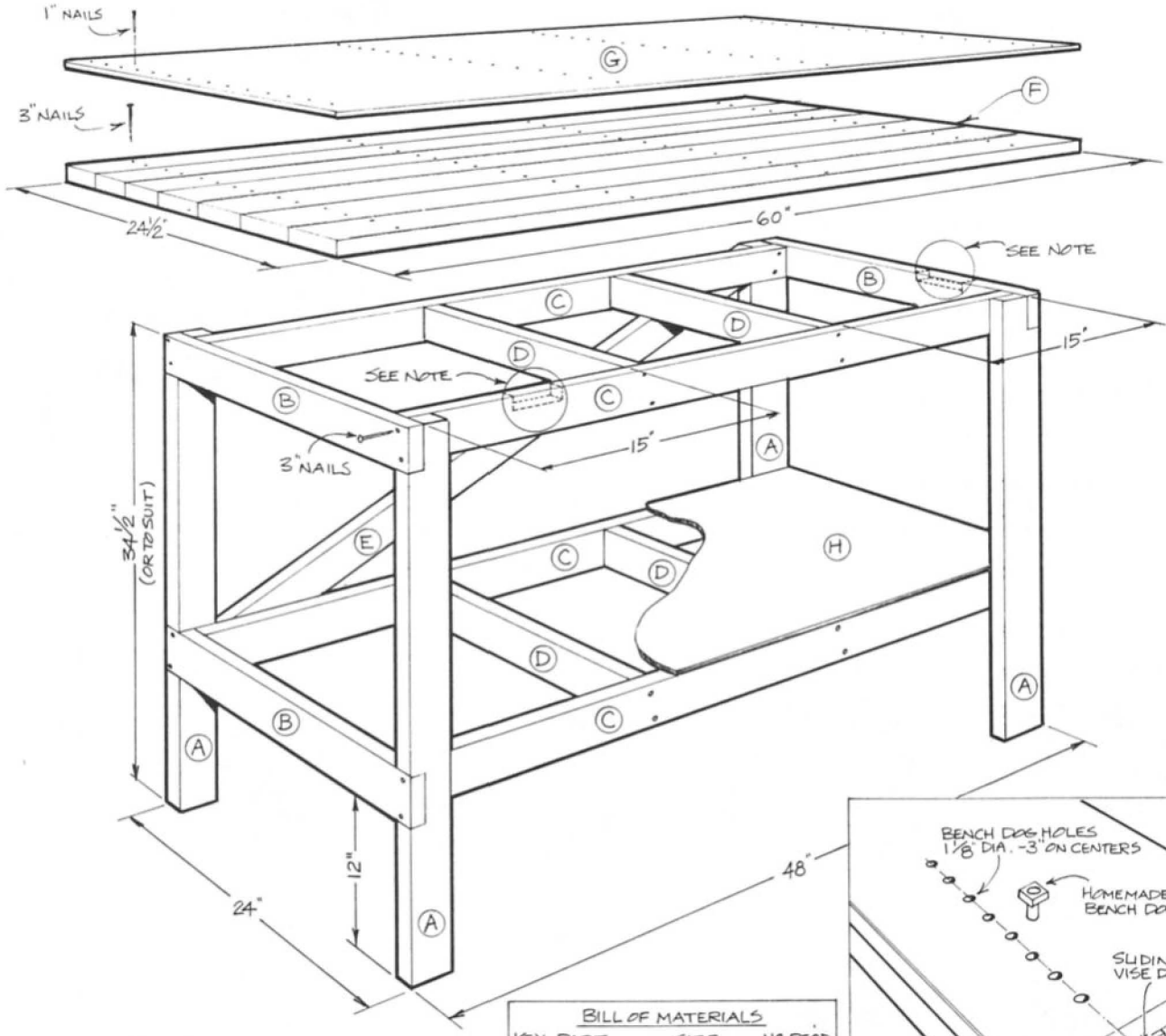
But to me a vise on the end of the bench is just as useful. Called a tail vise, it can hold a board flat along the bench length. For this, a sliding "dog" must be incorporated into the

vise. Nothing more than a bar of steel, the dog, in conjunction with a bench stop, acts as a clamping device. Vises with sliding dogs are also available from Fine Tool Shops, Inc. Prices range from $30 to $90.

If you want a tail vise, you will have to add a length of 2 x 4 to one end of the bench, preferably with long lag screws. Place the vise toward the front of the bench so you do not have to reach to work on a board. Also, if you are right-handed, put the vise on the right side of the bench. This puts the stresses of planing a board in toward the bench, not on the vise. If you are left-handed, put it on the opposite side. You may again have to notch out a piece of the upper side rail to allow for the vise's spindles and screw, and this can again be done with the bit brace and chisel.

You have probably seen pictures of workbenches with square holes in their tops. These holes take the bench stops that are also called dogs. Making square dog holes is not easy, but you can get the same clamping action by using round dogs and round holes that are bored with the bit brace. Space them every three inches in a row from where the vise dog is. Also, space them so they do not cut into any of the cross members.

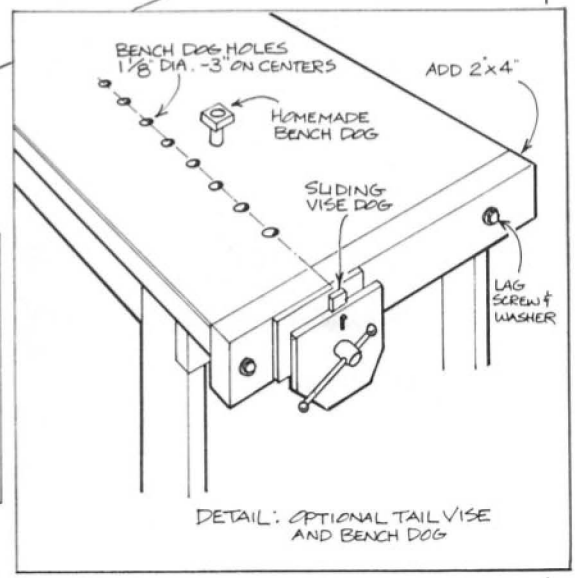
A simple dog you can make requires a 1 in. diameter dowel about 3 in. long and a piece of hardwood such as maple that is ½ in. thick. Drill a hole into the hardwood with a 1⅛ in. auger bit and glue the dowel flush with the top of the board. Cut the hardwood so it is 2 in. square. All that is left is drilling 1⅛ in. diameter holes into the bench top as shown in the detail below. WWJ



NOTE: THESE ARE POSSIBLE AREAS TO BE NOTCHED FOR BENCH VISES

BILL OF MATERIALS

KEY	PART	SIZE	NO. REQD
A	LEG	2"x4"x34½"	4
B	END RAIL	2"x4"x24"	4
C	SIDE RAIL	2"x4"x45"	4
D	CROSS MEMBER	2"x4"x18"	4
E	BRACE	2"x4"x52"	1
F	TOP	2"x4"x60"	7
G	TOP SURFACE	¼"x24½"x60"	1
H	SHELF	¼"x21"x48"	1



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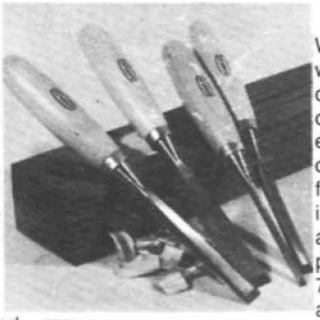

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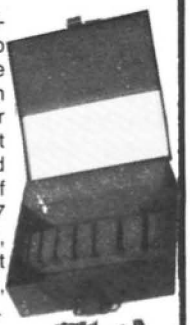
4 Pc. Chisel Set **$18.95** ppd

FORSTNER BIT SETS



We've sold thousands of these bits. Woodworkers have been delighted with their ability to cleanly drill flat bottomed holes, part of a circle or very thin materials. These bits leave a smooth edge even when drilling end grain — perfect for doweling. And now we've added another great feature. A sturdy metal case with a cushioned interior to protect the cutting surfaces. Best of all, we include the case at no extra charge! 7 pc. set consists of 1/4", 3/8", 1/2", 5/8", 3/4", 7/8", 1" with a metal case. A 15 pc. set (without a case) includes the above plus1-1/8", 1-1/4", 1-3/8", 1-1/2", 1-5/8", 1-3/4", 1-7/8" and 2".

7 Pc. Set with Case **$49.95** ppd

15 pc. set **$169.95** ppd

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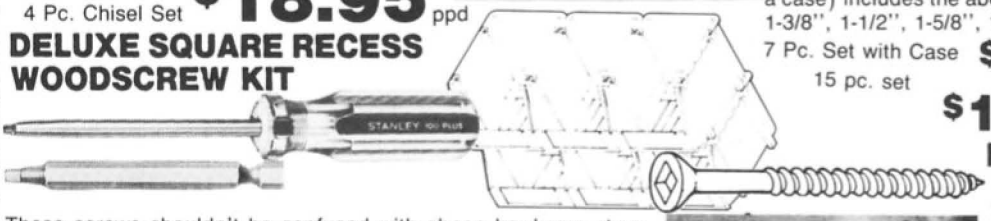
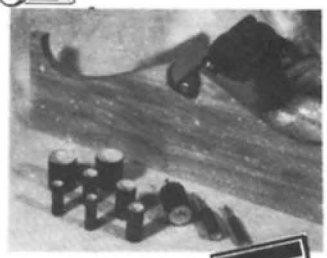


These screws shouldn't be confused with cheap hardware store screws — the soft kind with the shiny plating. All of our screws are hardened and tempered with a black oxidized finish to retard rusting. Widely used in furniture and cabinet making, the square recess helps prevent slippage (and damage) and lets you sock screws down tight. Thin shank eliminates the need for oversized pre-boring. Set consists of 600 #8 screws (100 each 1", 1¼", 1½", 2", 2½", 3"), hand screwdriver, power drill bit and a 6 bin unit which can be wall mounted or stacked on a bench. **$19.95** ppd

Square Recess Kit
(Also available in Phillips for $17.95)

DRUM SANDER SET



Use your drill or flexible shaft tool to sand contours and holes, grind and polish tools and perform many difficult finishing jobs. Sanding bands easily mount to our expandable drums without adhesive. Standard 15 pc. set contains 5 drums, 1 fine and 1 coarse band in sizes ½" x ½", ¾" x 1", 1" x 1", 1½" x 1½", 2" x 1½". Wide (2") band 12 pc. set contains 4 drums, 1 fine and 1 coarse band in sizes ½" x 2", ¾" x 2", 1" x 2', 1½" x 2". Refills available.

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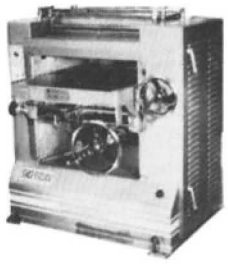

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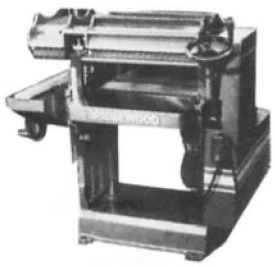

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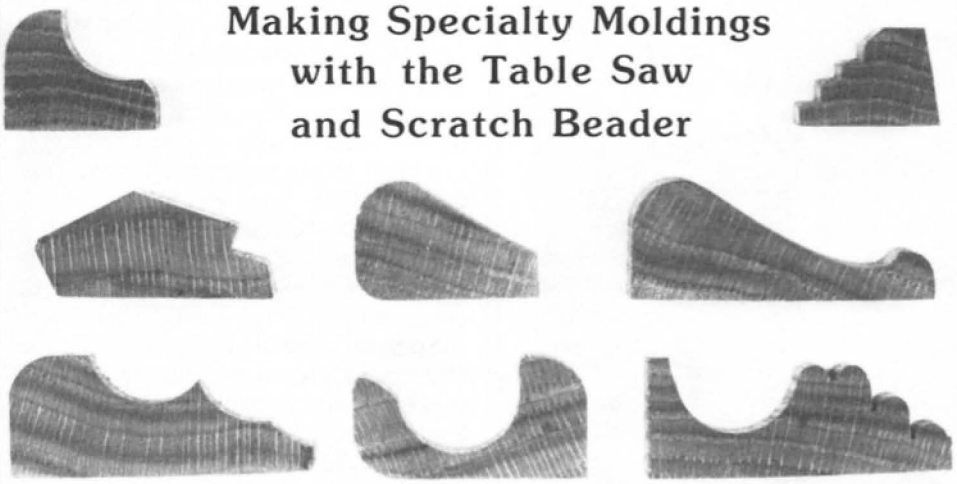
Special Techniques

Making Specialty Moldings with the Table Saw and Scratch Beader

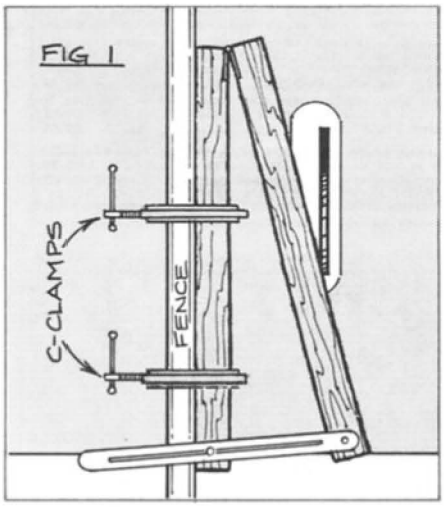


Moldings are an important element in woodworking. The origins of the molding plane can be traced some 2,000 years back to ancient Rome. From the latter half of the 19th and well into the 20th century, multiple molding planes, such as the classic "Stanley 45" (so named because of its 45 different blades) were the favorites of woodworkers. Today, of course, carbide tipped router bits and molding cutters can easily reproduce most common moldings.

Specialty moldings that cannot be reproduced with commercially available cutters are often called for in woodworking, however. From broad coves to intricate step cuts and even fine beads, practically any molding imaginable can be cut with either the table saw or scratch beader. In fact many veteran woodworkers actually prefer designing their own moldings to compliment a particular piece.

TABLESAWN MOLDINGS

There are several techniques for making tablesawn moldings. The most common technique involves passing the stock through the saw blade with the stock set at a given angle, instead of parallel, to the blade. Depending on the specific angle, this method can be used to create anything from wide circular cross-sections to an extremely narrow elliptical cove molding. If, for instance, the stock is passed through the blade at a direct right angle, the cove will be identical to the saw blade's radius. Substituting a smaller saw blade will result in a smaller radius. An adjustable-angle fence (Fig. 1) is a useful device that will enable you to accurately reproduce a wide range of cove moldings. The adjustable-angle fence is simply clamped onto the regular tablesaw fence.



The secret in cutting tablesawn cove moldings is patience. The moldings must be cut gradually by repeated passes over the saw blade. Never attempt to force the work or complete the cut with a single pass. Most experts recommend setting the blade height so that each pass will cut away between 1/16 to 1/8 in. of material.

It is a good idea to sketch the desired profile on the end of the stock. When the blade is almost to the line, set the blade height so that the final passes will only cut away about 1/32 of an inch. On the final pass, send the stock through slowly. This will result in a smooth surface requiring less sanding and finish preparation. If you intend to make a quantity of tablesawn cove moldings, you might do well to consider purchasing a 60 tooth carbide combination blade. This blade will leave a surface that requires almost no finish preparation.

(continued on next page)

Special Techniques (cont'd)

Variations of tablesawn moldings can be made by slightly tilting the saw blade. This will cause one side of the cove to be especially steep.

The tablesaw can also be used to cut circular coves. The stock will need to be mounted on a fixed point so that it can pivot freely across the blade. This technique was used to cut the curved profile of the lazy susan featured in the July/August 1984 issue of *The Woodworker's Journal.* It can also be used to cut coved profiles in arched panels.

Stepped moldings may also be cut with the tablesaw by simply making repeated straight passes along the blade with the blade set at various heights to create the "steps." A light sanding will smooth the kerf edges and remove any blade marks along the rises.

Almost any molding can be made by roughing out the shape with repeated passes of the saw blade. Extensive clean up work with gouges and sandpaper will be necessary, however, and it is well near impossible to reproduce identical pieces of molding this way.

When making any tablesaw molding it is generally a good idea to first make a test piece.

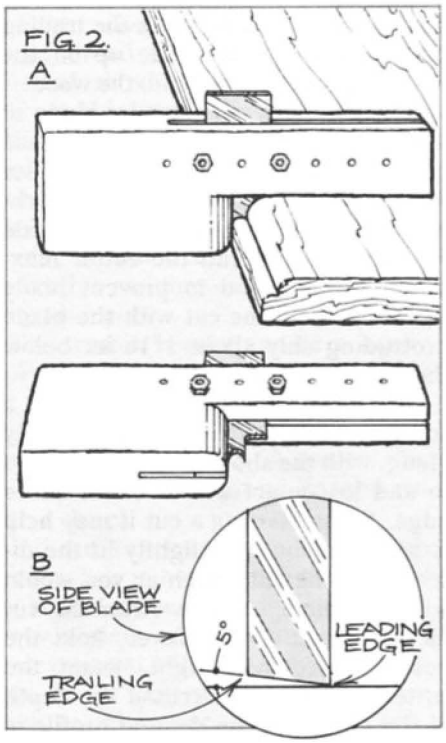
SCRATCH BEAD MOLDINGS

The scratch beader is a tool whose usefulness is often underestimated simply because many woodworkers are unfamiliar with its purpose or have never seen how effective it can be. In this age of motor-driven machinery and tools, the many applications of the scratch beader are sometimes overlooked as we've come to rely more heavily on power equipment. The scratch beader's deceptively simple design tends to mislead one into thinking of it as exclusively for small or delicate finish and trim work.

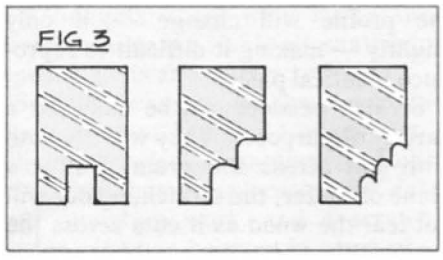
In fact, the scratch beader is a tool that can be substituted for a router or molding planes, and can be used in a great variety of applications, both simple and complex. Knowledgeable woodworkers have long recognized the extraordinary versatility of this simplest of tools. Cabinetmakers of old relied on the scratch beader as heavily as on any tool in their shop. The scratch beader is a tool that one must *use* to appreciate.

The scratch beader is nothing more than an L-shaped piece of hardwood with a vertical saw kerf extending the length of the arm and part way into the base of the L (Fig. 2A). The base of the

L has a rounded shoulder so the scratch beader will follow easily along curved edges. A series of bolt holes are drilled into the stock along the length of the saw kerf so that the steel cutter can be secured in various positions. Two bolts, one each located on either side of the cutter, hold it in place.



The cutter itself is nothing more than a piece of scrap steel. Old cabinet scrapers, saw blades, or small sections of sheet steel are ideal for making cutters. The cutter is shaped into the negative profile of the shape you intend to reproduce. It can be as simple as a rabbet, or as complex as a multiple bead (Fig. 3). Cut and file the desired shape into an appropriately sized section of steel. The steel should be wide enough so that it can be anchored in the scratch beader's shoulder, and long enough so that it extends out of the kerf. Naturally, the steel should be no thicker than the width of the scratch beader's kerf.



The cutting edge of the scratch beader should be almost perfectly square. It must never come to a point, as in a chisel or plane blade. The

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Special Techniques (Cont'd)

scratch beader cuts like a scraper, horizontally across the wood rather than vertically into it. Depending on the thickness of the steel, however, it may be necessary to apply a slight bevel, never more than 5 degrees, front to back along the edge (Fig. 2B). This bevel is important since with thicker steel, unless the leading edge of the cutter is slightly lower than the trailing edge, the cutter will ride up on the back edge and not bite into the wood.

Position the scratch beader blade so that it is recessed slightly into the base of the L, and so the beader's shoulder will ride along the edge of the workpiece, which in effect acts as a guide for the tool. To lend the cutter maximum stability and to prevent blade vibration, start the cut with the blade protruding only about 1/16 in. below the arm.

The scratch beader is used like a scraper. Draw the beader evenly along, with the shoulder always square to and in contact with the workpiece edge. When starting a cut it may help to angle the beader slightly in the direction of the cut, much as you would with a cabinet scraper. After the cut has been started, however, hold the beader perfectly upright. Reset the cutter regularly to increase the depth of the cut, until the desired profile is achieved.

The scratch beader is a hand tool, and as such is essentially an extension of the craftsman. His skill and experience will be reflected in the quality of work. Since the cutter is shaped by hand, success with the scratch beader largely depends on the care taken in forming the cutter's profile. As with so many of the finer woodworking disciplines, scratch beading is something of an art. There is no substitute for experience.

The scratch beader is certainly not a production tool. Cutters are essentially one-of-a-kind, and should be used only for individual projects. Once the cutter has been worn and then re-sharpened, the profile will change — if only slightly — making it difficult to reproduce identical pieces.

Scratch beaders can be used for a variety of purposes. They will cut both with *and* across the grain. Unlike a plane or router, the scratch beader will not tear the wood as it cuts across the grain. When cutting a rabbet across the grain, however, or approaching a corner work *in* from that corner to avoid splintering or chipping the wood at the workpiece edge. As a rule, the scratch beader is a tool that is best used with hardwoods.

The most common application of the scratch beader is for cutting intricate, unusual, or complicated bead-type moldings. It is better used cutting a quarter-round than a cove molding, because the quarter-round will require far less removal of material. Generally speaking, the scratch beader is a tool that will be most effective on smaller, narrower molding, as opposed to large, broad molding. Because the rounded shoulder will follow almost any arc it is especially suited for the difficult work of cutting moldings into curved stock, such as the arms and backs of some chairs, and the edges of round and oval tables. The scratch beader is also often used to apply a decorative molding on picture or mirror frame stock.

The scratch beader can be a handy tool for cutting beads into the panels for frame-and-panel doors, or for cutting fine grooves for inlay work. When cutting blind grooves, however, the end of the groove must be cleaned out with a chisel.

If there is a trick to using the scratch beader, it is in holding the tool so that the shoulder always rides firmly along the workpiece edge, with no variation in elevation at either end of the beader arm. If, for instance, the beader arm starts to ride up or down at one end, the cut will be sloppy and uneven. To minimize this problem we suggest continually readjusting the cutter so that after several passes the arm will always bottom on the workpiece. Each adjustment should lower the cutter about 1/16 in.

The scratch beader is also a potential money saver for the hobby craftsman. For many small jobs that call for expensive, bearing-guided router bits, you might do well to consider making a scratch beader instead. The work will take a little longer, but the money saved in foregoing the purchase of an expensive bit that will probably not be used again for years, is certainly worth the extra effort. For those of us on limited budgets (and who isn't) the scratch beader is a viable alternative to expensive bits and cutters.

Scratch beaders can be made in many different sizes to accommodate individual project requirements. Hobbyists find them irreplaceable for delicate miniature work, and a scratch beader can even be used in place of a wing cutter to cut the tambour grooves into the sides of a roll-top desk. In fact, by combining scratch bead and tablesaw techniques, the creative woodworker can reproduce or invent practically any molding imaginable. WWJ

Cabinetmakers' Supplies

Hardwood Suppliers

As a service to our readers, **The Woodworker's Journal** periodically lists sources of supply for various woodworking products. In this issue we are listing companies that sell hardwood lumber via mail order, in both large and small quantities. This is by no means a complete listing, and we hope to include additional companies in future issues.

American Woodcrafters
1025 S. Roosevelt Ave.
Piqua, OH 45356
Domestic, imported

Austin Hardwoods
2119 Goodrich, WJ
Austin, TX 78704
Domestic, imported

Craftwoods
109 21 York Road
Cockeysville, MD 21030
Domestic, imported
Also carries hand and power tools.

Croy-Marietta Hardwoods, Inc.
Dept. WJ
121 Pike Street, Box 643
Marietta, OH 45750
Domestic

General Woodcraft
100 Blinman Street, WJ
New London, CT 06320
Domestic, imported
Also carries hand and power tools.

Hardwoods of Memphis
P.O. Box 12449, Dept. WJ
Memphis, TN 38182-0449
Domestic, imported
Also carries hand and power tools.

Kaymar Wood Products
Dept. WJ
4603 35th S.W.
Seattle, WA 98126
Domestic, imported

Kountry Kraft Hardwoods
R.R. #1, WJ
Lake City, IA 51449
Domestic, some imported

Leonard Lumber Company
P.O. Box 2396
Branford, CT 06405
Domestic, imported

Local Lumber Company
113 Canal Street
P.O. Box 825
Shelton, CT 06484
Domestic

McFeely Hardwoods & Lumber
43 Cabell Street
P.O. Box 3
Lynchburg, VA 24505
Domestic, imported

Native American Hardwoods
Route 1
West Valley, NY 14171
Domestic

Sterling Hardwoods, Inc.
412 Pine Street, WJ
Burlington, VT 05401
Domestic, imported

Wood World
1719 Chestnut, WJ
Glenview, IL 60025
Domestic, imported

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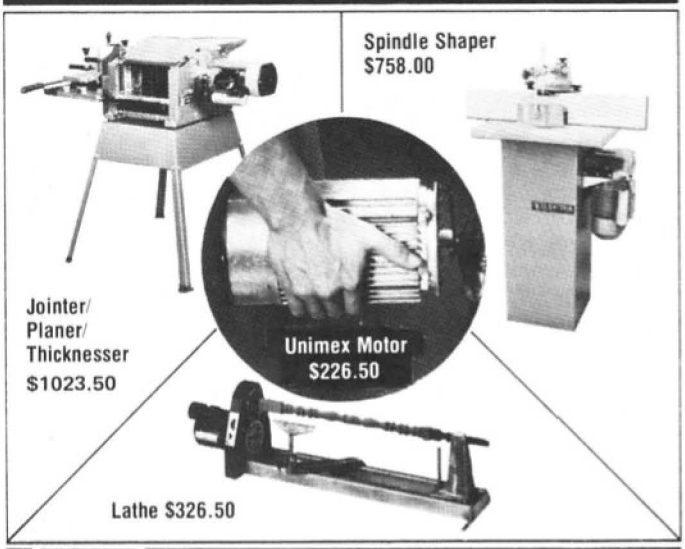

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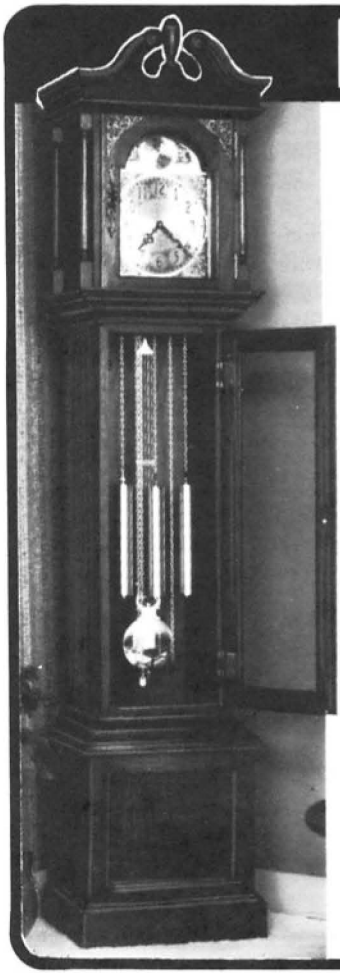

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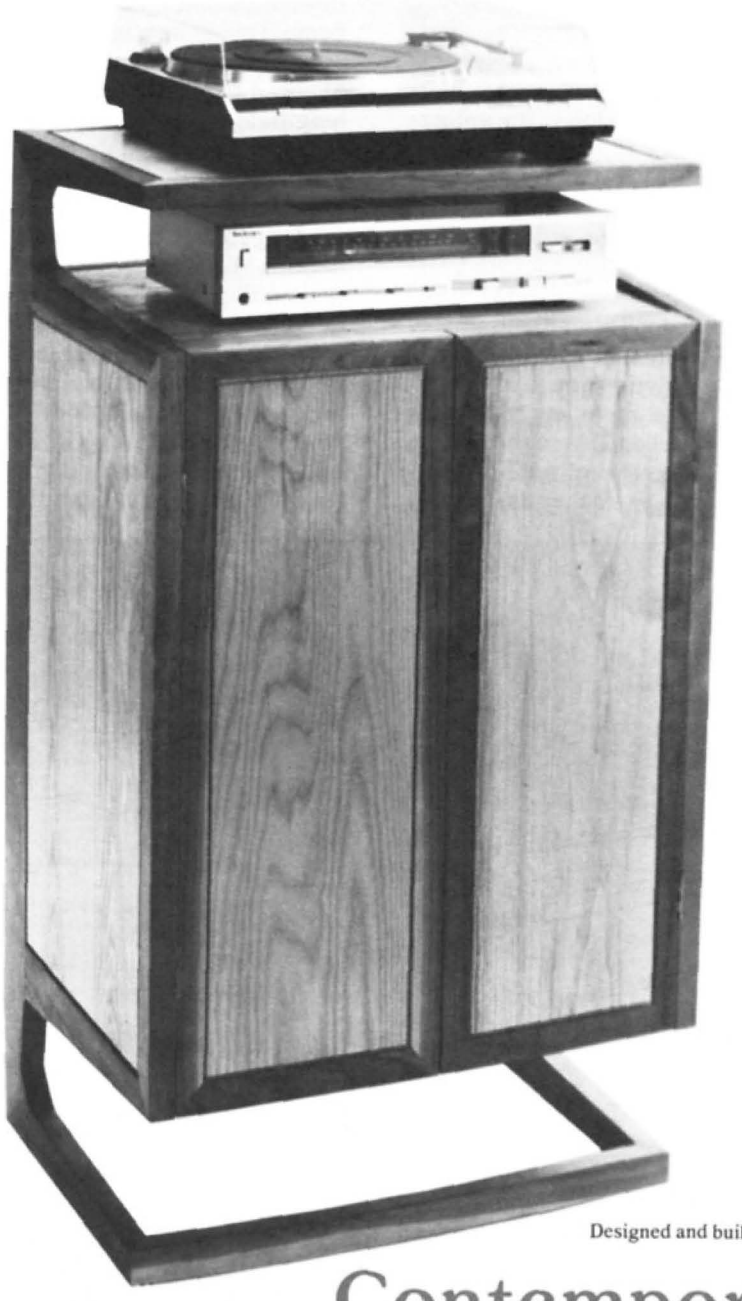


Designed and built by Phil Bacon

Contemporary Stereo Cabinet

This contemporary stereo cabinet is one of the nicest designs that we have seen. The crisp angles and full panel construction lend this cabinet a distinct museum-piece quality. A combination of double-splined and mortise-and-tenon joinery, together with complicated miters and frame-and-panel construction, make this a project for the experienced woodworker.

The cabinet is designed to hold a complete stereo component system (not including speakers), in addition to a healthy supply of records and tapes. The top shelf is for the turntable, with the tuner located just below. The glass inner shelf (or shelves) will hold an amplifier and/or tape deck and tapes. Albums fit comfortably across the bottom. Although our cabinet was constructed of cherry, with oak panels, any attractive combination of hardwoods should work well for this piece. As a rule, however, cabinets of this type look best when the panels are lighter in color than the frames.

Make the oak panels first. Because the panels are ⅜ in. thick, a stock size not usually commercially available, it will be necessary to either thickness-plane ½ in. stock, or resaw 1 in. stock to form these panels. Stock will have to be edge-glued to form the wider panels. An especially fine cabinetmaking technique is to bookmatch resawn 1 in. stock for the panels. The bookmatched stock is then planed to its final ⅜ in. thickness. The two door panels (A) can be bookmatched, as can the side panels (B) and shelf panel (C). Because they are less visible, the top and bottom panels (D) and back panel (E) need not be bookmatched. All panels are sized so that they extend ¼ in. into the panel dadoes in the cabinet frame.

The raised edge and ¼ in. radius profile of the panels (see detail) should be cut on the router table. Start with a straight cutter to make the flats, and use a ½ in. core box bit to form the radius.

To build the cherry frame, which may be cut entirely from 5/4 in. stock (nominal thickness 1⅛ in.), begin by rough cutting all frame members. It is important that one edge of the frame members be trued, either with a jointer, or by hand. The two sides (F), shelf ends (G), top ends (H), bottom ends (I), and base ends (J) are first cut square. The tapers on parts G, H, and I narrow to a point where they are 1⅛ in. square, while the taper on part J narrows to 1⅛ by 1½ in. These tapers may be cut with the bandsaw, or with the tablesaw using a tapering jig. Next, cut the stiles (K), rails (L), base front (M), shelf front (N), and the five stretchers (O). All these pieces are cut 1⅛ in. square, except part M, which is 1⅛ in. by 1½ in.

The miters may now be cut. You will note that all miters are the standard 45 degrees, except where the shelf and sides meet — the shelf ends being mitered to 35 degrees, and the matching side ends being mitered to 55 degrees (see detail). The five stretchers (O) can be tenoned with the table saw dado-head, and the corresponding mortises can be cut by first drilling out each mortise, and then squaring it with the chisel. Although the mortise and tenon location of the shelf stretcher will be

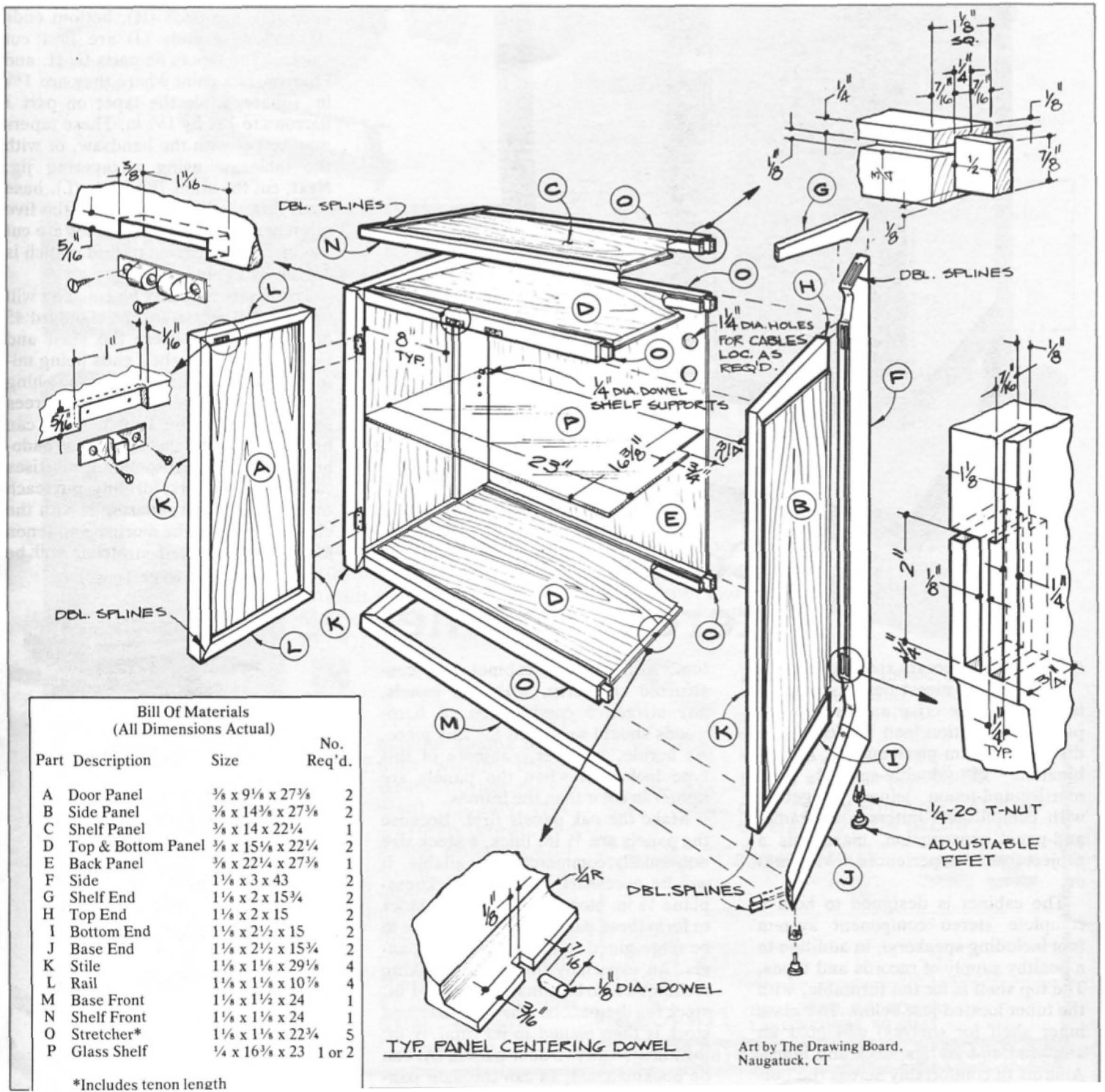
(continued on next page)

close to the splines in the 35-55 degree miters, it should not actually interfere with these splines. Because the mortises extend across the miters, however, these mortises should be cut *after* the side assemblies are complete.

The ¼ in. spline dadoes in the mitered corners (see detail), are best cut by setting up a router table jig that will enable you to gently lower the workpiece over a ¼ in. plunge-cut router bit, with the jig serving as both a guide and a stop (see jig detail). Although a 45 degree guide board will work fine for the spline dadoes in all the 45 degree mitered corners, you will need to modify the jig with 35 and 55 degree guide boards in order to cut the spline dadoes in the bastard size 35-55 degree shelf miter. The splines are cut from cherry which has been resawn to ¼ in. thick. Remember, of course, that to provide an effective joint, the spline grain must always run perpendicular to the stock grain.

The 1/8 in. wide by 7/16 in. deep panel dadoes should be cut with the table saw. Take time, however, to first lay out the frame components and mark for each dado. This will eliminate the potential confusion of a dado cut into the wrong edge, or on the wrong side of the frame member. You will note that the panel dadoes in the frame members at the bottom of the five vertical panels, and at the ends of the three horizontal panels are only ¼ in. deep. This is because most expansion occurs side to side across the grain, as opposed to vertically along the grain's length.

Before the assembly process begins, notch panels B, C, D, and E to accept one end of the 1/8 in. diameter by 7/16 in. long panel centering dowels (see detail). You must also drill a corresponding ⅛ in. diameter by ¼ in. deep dowel hole in each of the frame members at the panel ends. These panel centering dowels are important for the larger panels since they evenly distribute whatever tendency the panels have to come and go as they respond to changes in humidity.



Bill Of Materials
(All Dimensions Actual)

Part	Description	Size	No. Req'd.
A	Door Panel	⅜ x 9⅛ x 27⅜	2
B	Side Panel	⅜ x 14⅜ x 27⅜	2
C	Shelf Panel	⅜ x 14 x 22¼	1
D	Top & Bottom Panel	⅜ x 15⅛ x 22¼	2
E	Back Panel	⅜ x 22¼ x 27⅜	1
F	Side	1⅛ x 3 x 43	2
G	Shelf End	1⅛ x 2 x 15¾	2
H	Top End	1⅛ x 2 x 15	2
I	Bottom End	1⅛ x 2½ x 15	2
J	Base End	1⅛ x 2½ x 15¾	2
K	Stile	1⅛ x 1⅛ x 29⅛	4
L	Rail	1⅛ x 1⅛ x 10⅞	4
M	Base Front	1⅛ x 1½ x 24	1
N	Shelf Front	1⅛ x 1⅛ x 24	1
O	Stretcher*	1⅛ x 1⅛ x 22¾	5
P	Glass Shelf	¼ x 16⅜ x 23	1 or 2

*Includes tenon length

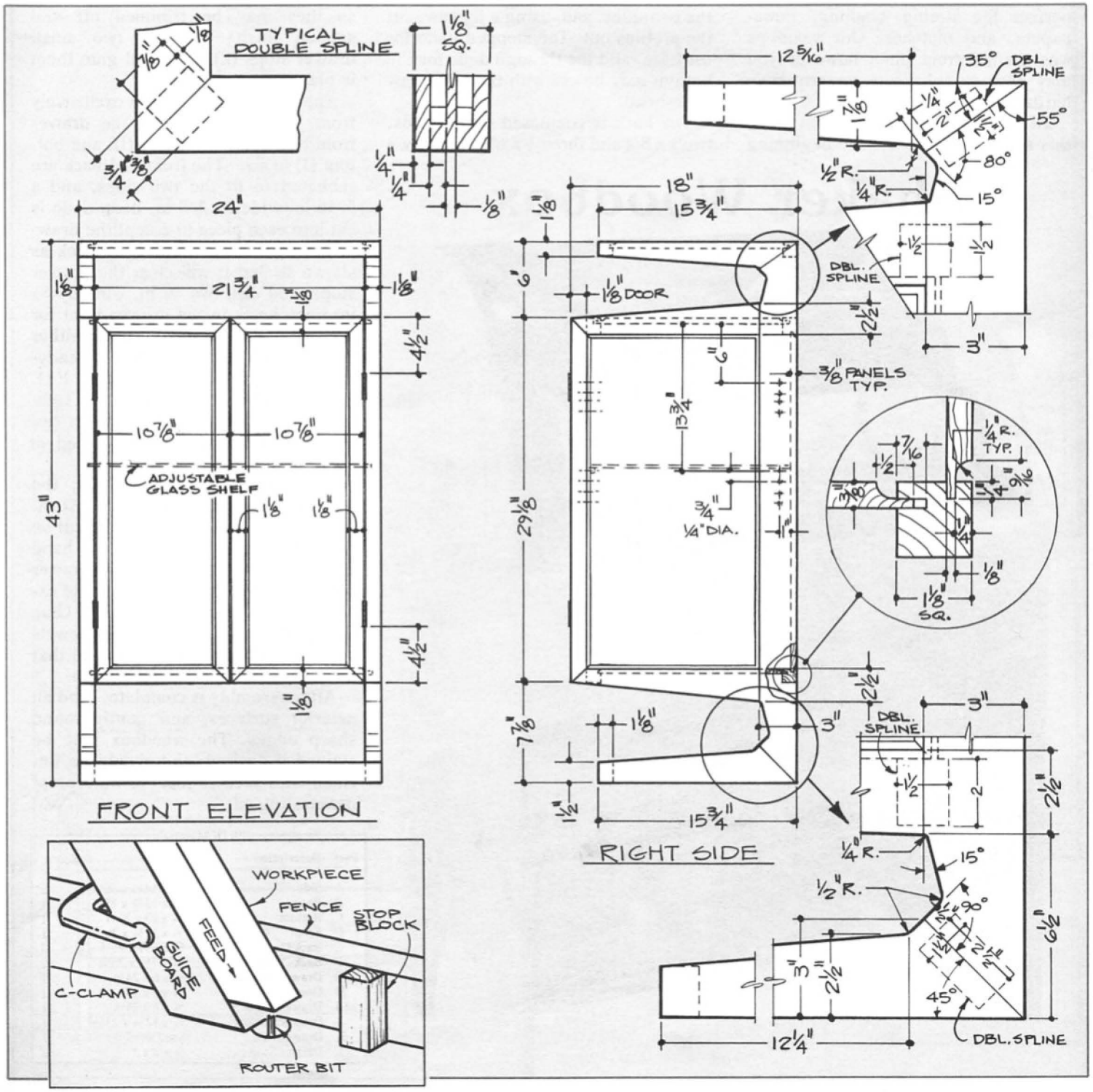
Art by The Drawing Board, Naugatuck, CT

Construct the two frame-and-panel side assemblies first. The ¼ in. and ½ in. radii, and the angled cutouts at the top and base of these frames are made *after* the side frame assemblies are complete. Using the drill press, drill a ½ in. diameter hole to make the ¼ in. radius, and a 1 in. diameter hole to make the ½ in. radius. Then bandsaw between these holes to complete the cutout.

Now assemble the remaining frames and panels, together with the side assemblies, to complete the cabinet carcase. The cabinet doors are assembled separately. Mortise the doors and frame stiles to accept the 2 in. hinges. Any better quality brass-finish butt-hinge will work well for hanging the cabinet doors. Also mortise the door stiles and cabinet edges (see detail) to accept the two ball-type catches. Finally, drill four ¼ in. diameter holes into the cabinet base to accept the ¼-20 T-nuts and levelers. Both the ball catches and levelers are available from Craft Products Company, 2200 Dean Street, St. Charles, Illinois 60174. Order part no. 3231-F32 for the catches, and part no. 3263-L90 for a set of four levelers.

The glass shelf (P) is an item that must be custom cut at a glass shop. Check your interior cabinet dimensions before ordering the glass, and allow an ⅛ in. all around so the shelf will fit inside easily. The shelf is adjustable, supported on moveable ¼ in. dowels. Drill the dowel holes about 1 in. apart. Also, drill several 1¼ in. holes in the back panel, to accommodate speaker and electrical lead wires. The 1¼in. diameter holes are necessary to allow the plug ends of the wires to pass through.

The stereo cabinet will look best if it is finished naturally. Fine sand the frames and panels, gently softening the cabinet corners. Do not sand over the raised panel radius, however. This sharp edge is important to the cabinet's crisp, contemporary look. Rub in three coats of Watco penetrating oil for a protective satin sheen. WWJ



Shaker Woodbox

The seasons roll along, and we expect that many of our fellow woodworkers have already laid in a healthy supply of cord wood for the cold winter months ahead. If you burn wood, no doubt you have long ago resigned yourself to accepting the accompanying mess of sawdust, twigs, bits and pieces of bark, leaves, bugs, and plain old dirt. Although there is no way around the fact that there will always be some mess when you burn wood, a wood box will go a long way toward reducing and controlling that mess.

This Shaker woodbox is one of the better woodbox designs that we have seen. In addition to a generous cordwood bin, it features a drawer that is perfect for storing kindling, newspapers, and matches. Our woodbox was crafted from pine, however you may wish to substitute an attractive hardwood instead.

To simplify construction, and make this an ideal project for the beginning woodworker, we decided to use dowel joinery throughout. (The advanced woodworker may wish to substitute dovetail joinery.) The entire piece can be constructed from ¾ in. thick material. Standard 1 x 6 and 1 x 8 pine boards, readily available at any lumberyard, are ideal for this project.

Begin by edge-gluing several 1 x 8 boards to form each of the 2 sides (A). Since 1 x 8 boards have an actual width of only 7¼ in., the two boards should give you exactly the 14½ in. width needed for each side. Also glue up ¾ in. boards to form the base (B), bottom (C), front (D), and drawer bottom (J).

Referring to the illustration, now transfer the top and bottom contours to the two sides, and, using a jig saw, cut the profiles out. The stopped dado for the base, and the through dado for the bottom may be cut with the table saw dado-head.

The back is composed of 5 boards, two 1 x 8's and three 1 x 6's. As shown in the illustration, the boards are shiplapped for strength. The rabbets in each board, to create this ship-lapped effect, are cut with the dado-head, as are the rabbets along the back inside edge of the sides. After the base, bottom, front, two sides and back boards have all been cut to size, you may begin assembly.

Glue the sides, base, bottom, back boards and front together first. Do not glue the back boards along the shiplaps, however, and leave a ⅛ in. space between these boards (See Detail) to allow for expansion and contraction in the wood. After the assembly has dried, drill out the dowel holes as indicated. Cut the dowels slightly long, so they may be trimmed off and sanded flush. Cut the two small drawer stops (L) next, and glue them in place.

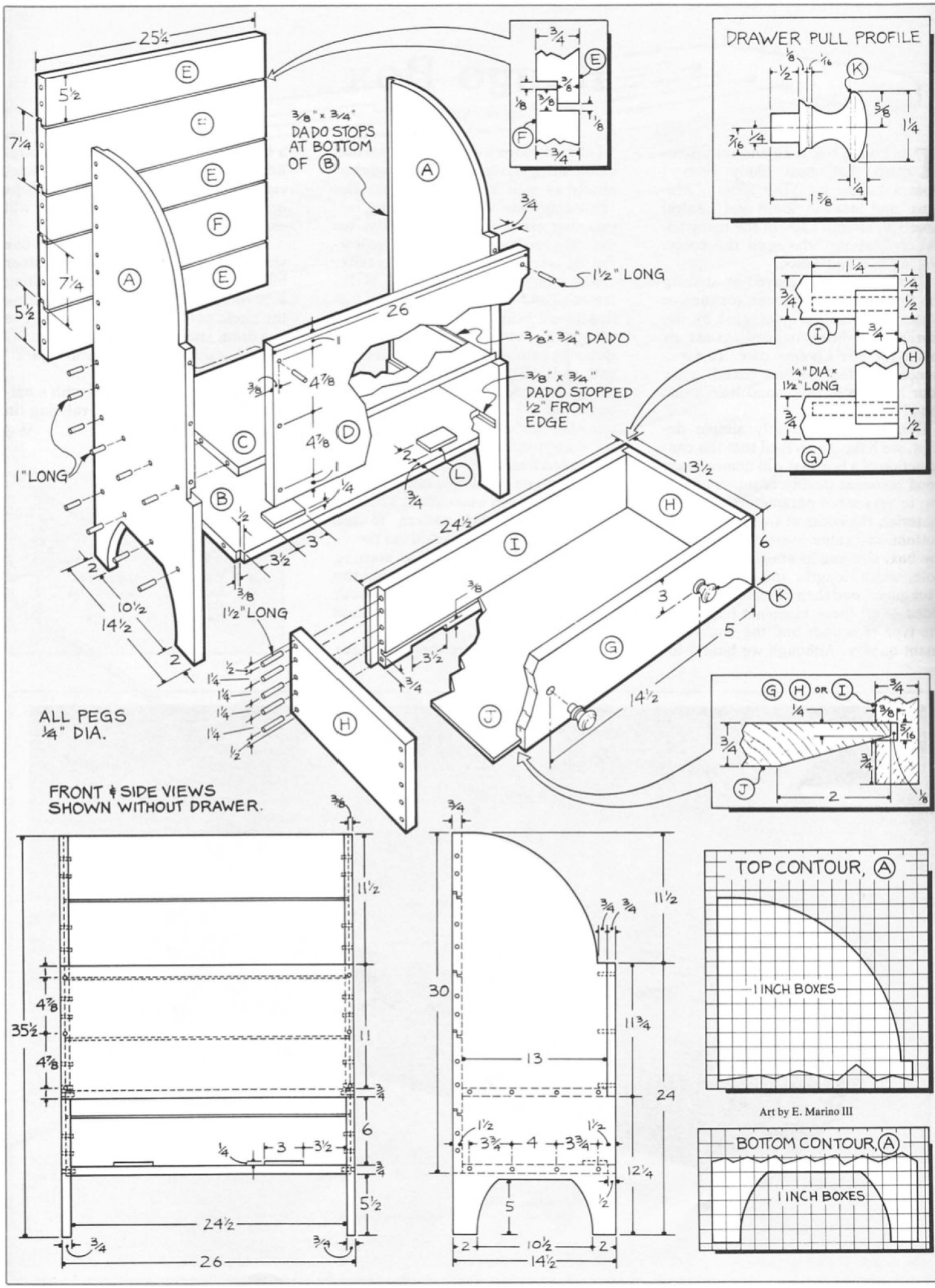
The drawer is also made exclusively from ¾ in. boards. Cut the drawer front (G), sides (H), back (I), and bottom (J) to size. The front and back are rabbeted to fit the two sides, and a 5/16 in. wide by 3/8 in. deep dado is cut into each piece to accept the drawer bottom. Notch the drawer back as shown so that it will clear the drawer stops, and drill two ½ in. wide by ½ in. deep holes in the drawer front for the knobs (K). These knobs may either be turned on a lathe or ordered ready-made from: Shaker Workshops, P.O. Box 1028, Concord, Mass. 01742. Telephone: (617) 646-8985. Order Part No. W341. A package of 10 is priced at $3.75 postpaid.

In traditional Shaker fashion, the drawer bottom is a bevel edged ¾ in. board. The bevels may either be cut on the tablesaw, or shaped with the hand plane. You will note that the drawer bottom is sized to allow for ⅛ in. of expansion on all sides (See Detail). Glue up the drawer carcase, using dowels where shown, however take care that no glue gets on the drawer bottom.

After assembly is complete, sand all exterior surfaces, and gently round sharp edges. The woodbox may be stained if desired, and should be finished with several coats of waterproof penetrating oil. WWJ

Bill Of Materials

Part	Description	Size	No. Req'd.
A	Side	¾ x 14½ x 35½	2
B	Base	¾ x 13¾ x 25¼	1
C	Bottom	¾ x 13 x 25¼	1
D	Front	¾ x 11¾ x 26	1
E	Back (Narrow Boards)	¾ x 5½ x 25¼	3
F	Back (Wide Boards)	¾ x 7¼ x 25¼	2
G	Drawer Front	¾ x 6 x 24½	1
H	Drawer Side	¾ x 6 x 13	2
I	Drawer Back	¾ x 6 x 24½	1
J	Drawer Bottom	¾ x 12½ x 23½	1
K	Drawer Pull	See Detail	1
L	Drawer Stop	¼ x 2 x 3	2



Art by E. Marino III

Bongo Box

by Johanna Walton

The bongo box is an ancient instrument that most likely evolved from a hollow log. The Aztecs, Mayans, and Incas in South and Central America, are but a few of the many tribal civilizations who used the bongo box in ritual and dance.

The bongo box is played by striking the different sized wooden tongues or keys. The sound is generated by the vibration of these tongues against air inside the box's hollow core. To experience the "feel" of this sound, place your hand over the sound hole while the keys are played.

Despite its apparently simple design, we have discovered that the construction of a box that will demonstrate good resonant quality requires adhering to very strict parameters. Type of material, thickness of stock — for top, bottom, and sides — size and shape of the box, size and location of the sound hole, width, length, and shape of the "tongues" *and* their distance from box sides — all these elements impact on the type of sounds and the box's resonant quality. Although we built a total of four boxes in various shapes and using different materials, none worked nearly as well as this first box. Because there are so many separate factors that effect the tonal quality, we strongly recommend carefully following our original design for best results.

The bongo box is built from ¾ in. redwood and cedar, with a ⅛ in. mahogany-ply bottom. All joints are simply glued, butted tight and clamped. Begin by cutting the redwood sides (A) and ends (B) to size. Glue up and clamp these four sides. Next, cut the cedar top (C) and mahogany-ply bottom (D). Both these pieces should be cut slightly oversize, so they may later be sanded flush.

The tongue pattern is cut out *after* the box has been assembled. Transfer the illustrated grid pattern to the bongo box top, and first drill out the ⅜ in. holes. These holes serve as starting points for the saber saw as you cut the individual tongues. Use a fine tooth metal cutting blade for the smoothest possible cut.

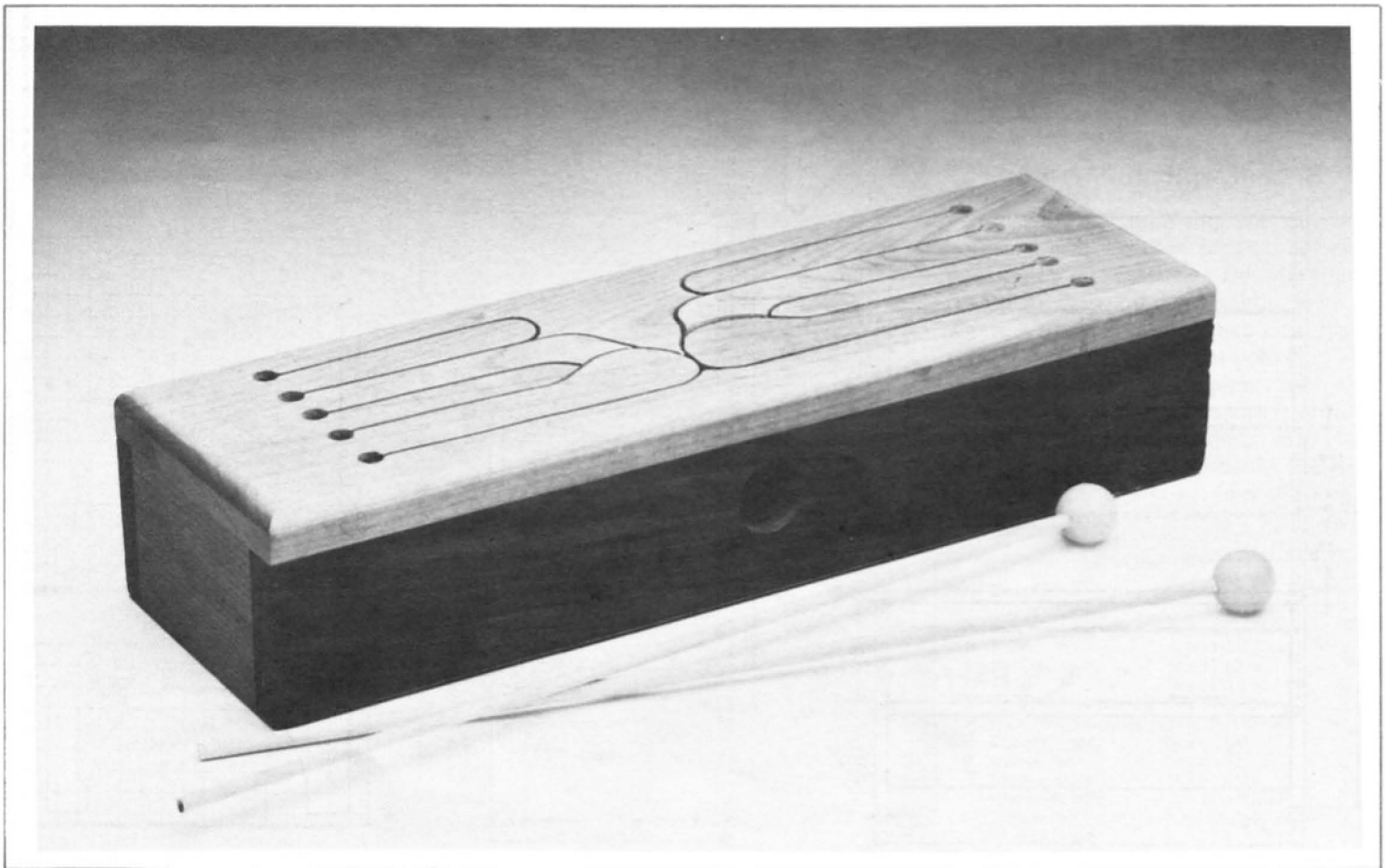
After the cutouts are complete, take a hacksaw blade or thin file and carefully clean out the kerfs. This is especially important since any wood chips or fuzz that is caught in the kerfs will cause the keys to sound flat.

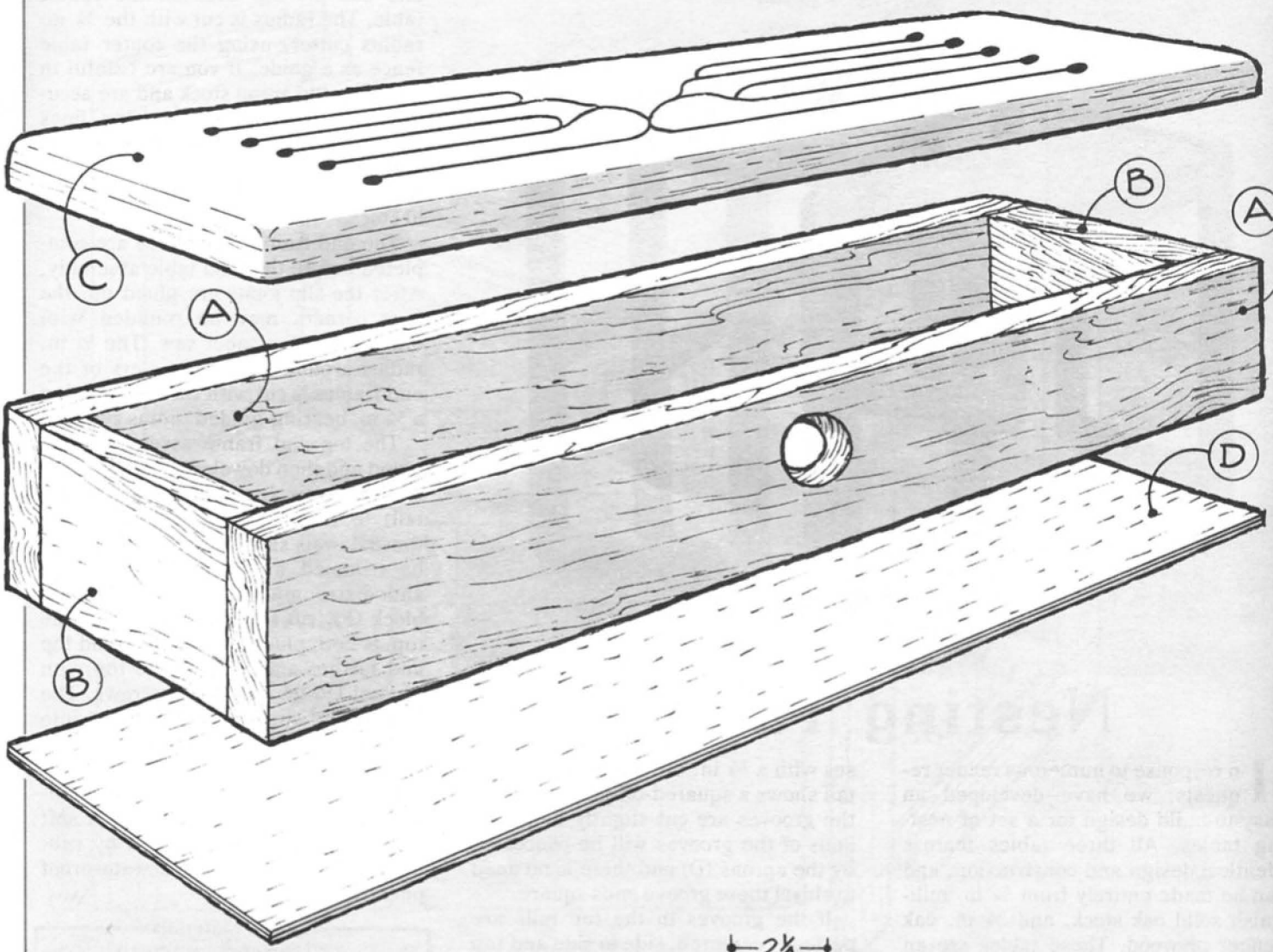
The 1¼ in. sound hole in the box side may either be cut with a Forstner bit on the drill press, or by first drilling a ⅜ in. starter hole, and then cutting the circle out with the saber saw. The two drum sticks are simply ¼ in. dowel rod epoxied into plastic "jack" balls.

The bongo box looks best with a natural finish, achieved by rubbing in lemon or tung oil. WWJ

Bill Of Materials
(All Dimensions Actual)

Part	Description	Size	No. Req'd.
A	Side	¾ x 2⅛ x 18	2
B	End	¾ x 2⅛ x 4½	2
C	Top	¾ x 6 x 18	1
D	Bottom	⅛ x 6 x 18	1




C
A
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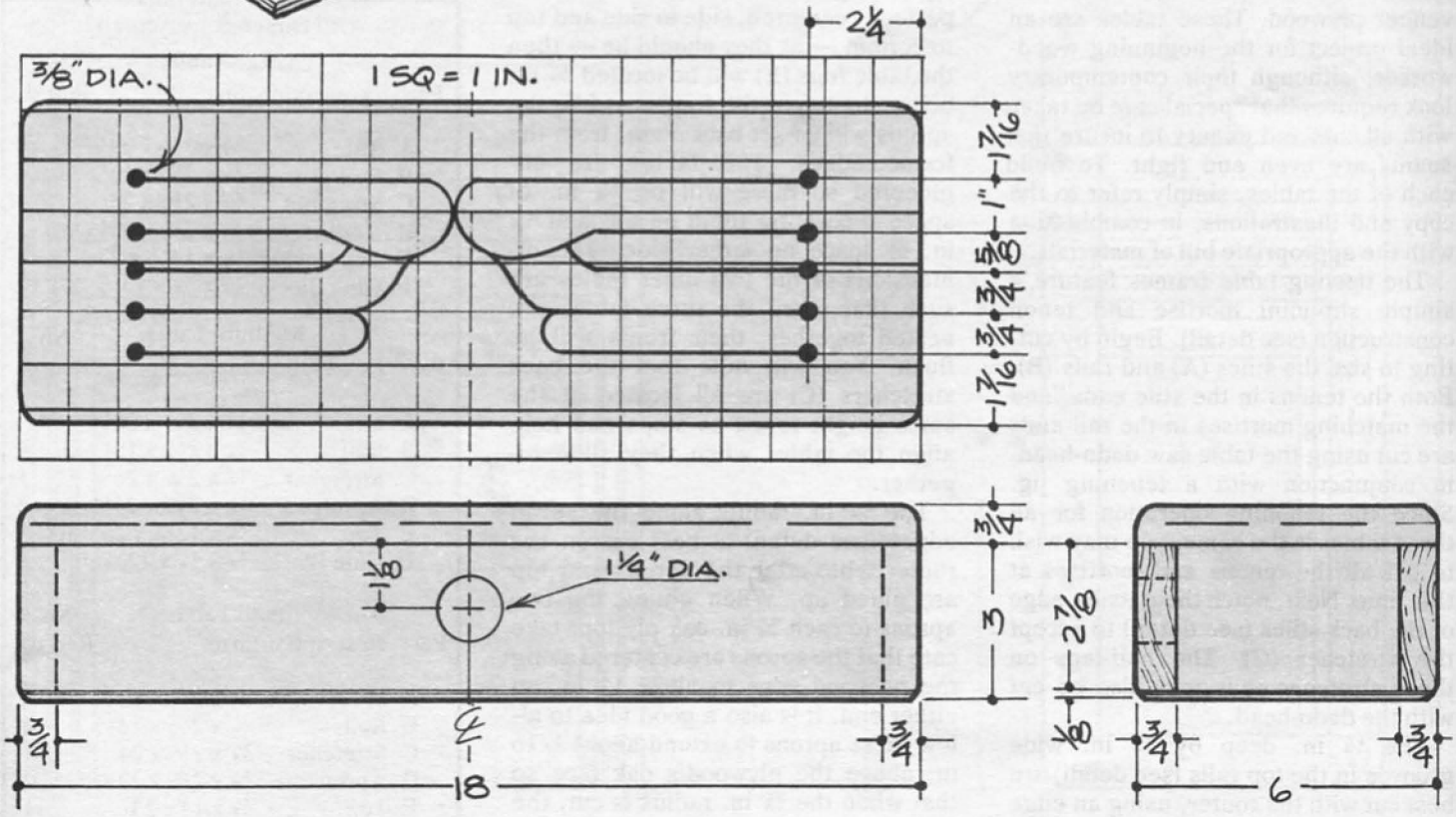

2¼
3/8" DIA.
1 SQ = 1 IN.
1 7/16
1"
5/8
3/4
3/4
1 7/16
3/4
1⅛
1¼" DIA.
3
2 7/8
1/8
3/4
3/4
18
3/4
3/4
6

Nesting Tables

In response to numerous reader requests, we have developed an easy-to-build design for a set of nesting tables. All three tables feature identical design and construction, and can be made entirely from ¾ in. mill-finish solid oak stock, and ¾ in. oak veneer plywood. These tables are an ideal project for the beginning woodworker, although their contemporary look requires that special care be taken with all cuts and joinery to insure that seams are even and tight. To build each of the tables, simply refer to the copy and illustrations, in combination with the appropriate bill of materials.

The nesting table frames feature a simple slip-joint mortise and tenon construction (see detail). Begin by cutting to size the stiles (A) and rails (B). Both the tenons in the stile ends, and the matching mortises in the rail ends are cut using the table saw dado-head, in conjunction with a tenoning jig. Since the tenoning operation for all three tables is the same, you may wish to cut all the tenons and mortises at this time. Next, notch the outside edge of the back stiles (see detail) to accept the stretcher (C). The half-laps on these stretcher ends may also be cut with the dado-head.

The ¼ in. deep by ¾ in. wide grooves in the top rails (see detail) are best cut with the router, using an edge guide. If you don't have a ¾ in. flat-bottom bit, simply make several passes with a ½ in. bit. Although the detail shows a squared-off groove end, if the grooves are cut slightly long, the ends of the grooves will be concealed by the aprons (D) and there is no need to chisel these groove ends square.

If the grooves in the top rails are perfectly centered, side to side and top to bottom — as they should be — then the table tops (E) will be located ¾ in. below the top of the frames, while the aprons will be set back ½ in. from the frame edges. The tables are engineered so there will be ¼ in. of space separating them on top and ¼ in. of space on either side. The dimensions of the two inner tables are such that when the three tables are nested together, their fronts will be flush. You will note that the back stretchers (C) are all located at the same height to act as stops and help align the tables when they slide together.

The ¾ in. radius along the apron edges (see detail) is best cut on the router table after the aprons and top are glued up. When gluing the two aprons to each ¾ in. oak ply top, take care that the aprons are centered along the plywood edge to allow ¼ in. on either end. It is also a good idea to allow these aprons to extend about 1/16 in. above the plywood's oak face so that when the ¾ in. radius is cut, the apron's top edge will be brought down perfectly flush with the oak face. To cut this radius, flip the glued-up apron and oak ply top over on the router table. The radius is cut with the ¾ in. radius cutter, using the router table fence as a guide. If you are careful in selecting the apron stock and are accurate with your cuts, the glue lines where the aprons and top meet will be almost invisible, giving the assembly the appearance of a single piece of solid stock.

The end frame assemblies are completed before the final table assembly. After the slip joints are glued up, the four corners may be rounded with either a band or saber saw. The ¼ in. radius around both perimeters of the end frames is cut with the router using a ¼ in. bearing-guided radius cutter.

The top and frame assemblies are glued and then doweled together using ⅜ in. dowels angled slightly (see detail) to create a locking effect. Cut these dowels slightly long so they may be trimmed and sanded flush. For added strength, a ¾ in. square glue block (F), cut the same length as the top, is both glued to the frame and top and further anchored to the top with several 1¼ in. long wood screws. The half-lapped stretcher (C) is glued into the corresponding notches in the back stiles.

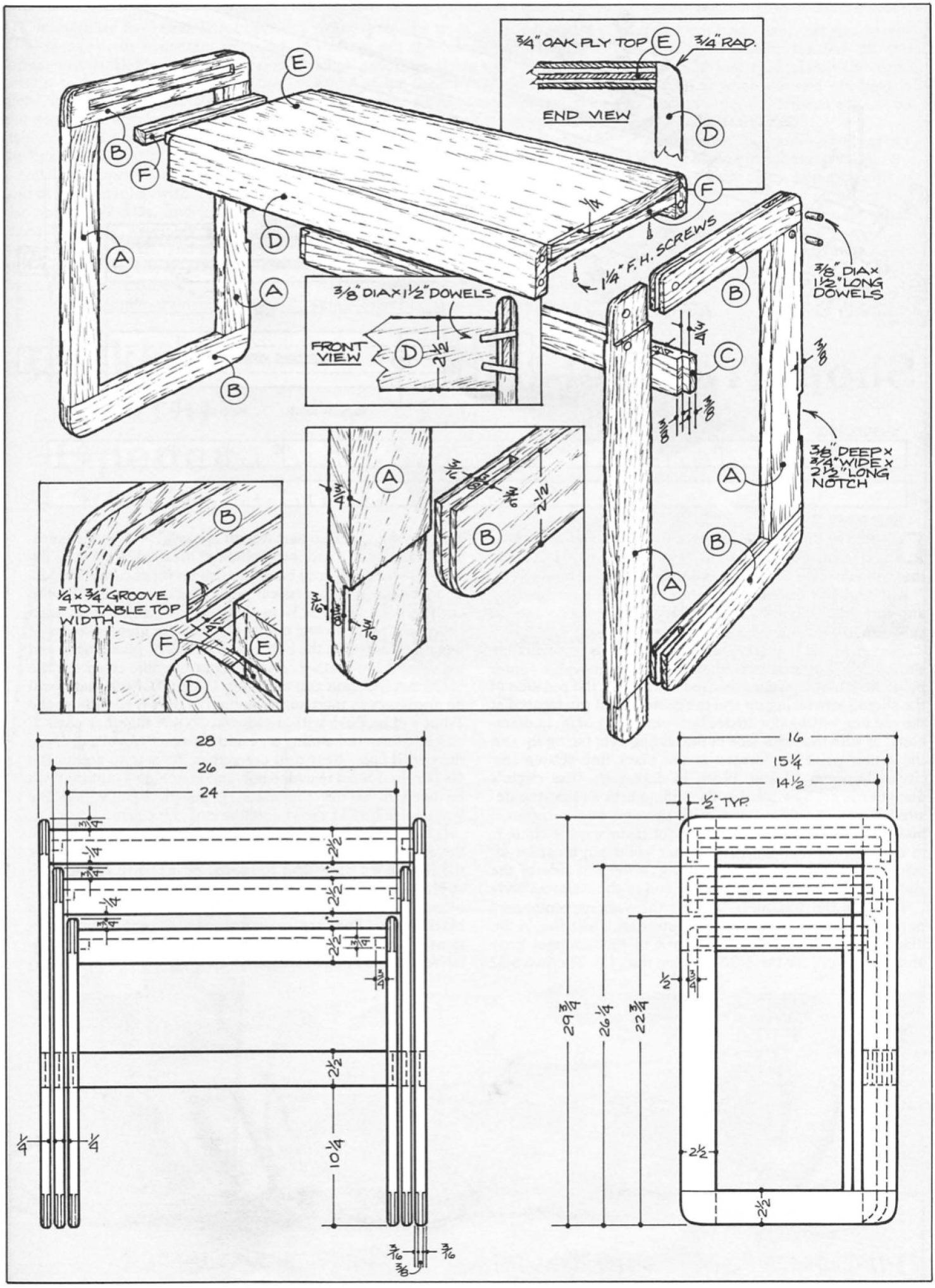
Final sand the tables, gently rounding all remaining sharp edges. A soft satin finish may be obtained by rubbing in several coats of a waterproof penetrating or tung oil. WWJ

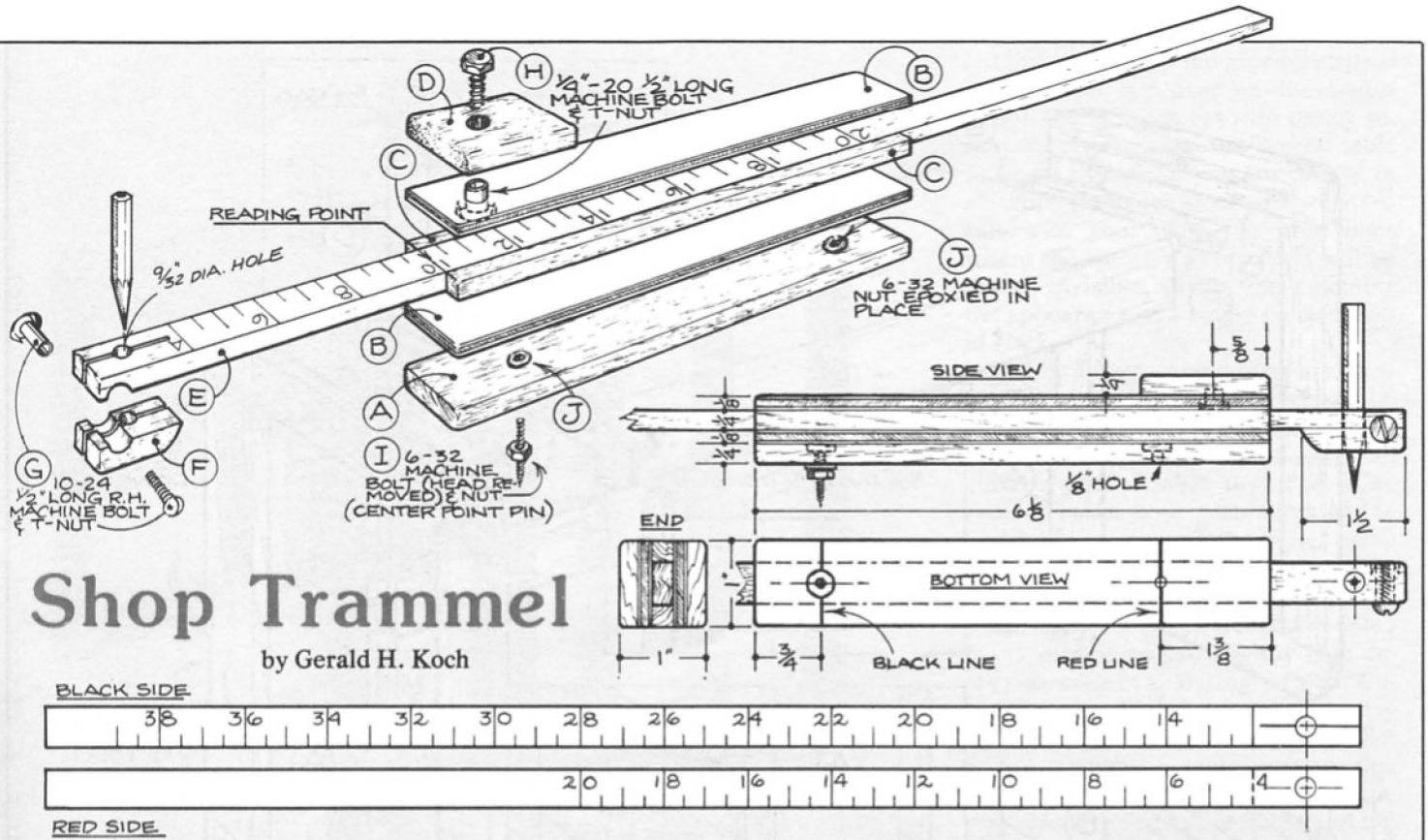
Bill Of Materials
(All Dimensions Actual)

Part	Description	Large Table Size	No. Req'd.
A	Stile	¾ x 2½ x 29¾	4
B	Rail	¾ x 2½ x 16	4
C	Stretcher	¾ x 2½ x 28	1
D	Apron	¾ x 2½ x 26½	2
E	Top	¾ x 13½ x 27	1
F	Glue Block	¾ x ¾ x 13½	2

Part	Description	Medium Table Size	No. Req'd.
A	Stile	¾ x 2½ x 26¼	4
B	Rail	¾ x 2½ x 15¼	4
C	Stretcher	¾ x 2½ x 26	1
D	Apron	¾ x 2½ x 24½	2
E	Top	¾ x 12¾ x 25	1
F	Glue Block	¾ x ¾ x 12¾	2

Part	Description	Small Table Size	No. Req'd.
A	Stile	¾ x 2½ x 22¾	4
B	Rail	¾ x 2½ x 14½	4
C	Stretcher	¾ x 2½ x 24	1
D	Apron	¾ x 2½ x 22½	2
E	Top	¾ x 12 x 23	1
F	Glue Block	¾ x ¾ x 12	2


3/4" OAK PLY TOP
E
3/4" RAD.
END VIEW
D
F
A
B
1/4
1 1/4" F.H. SCREWS
3/8" DIA x 1 1/2" LONG DOWELS
3/8" DIA x 1 1/2" DOWELS
FRONT VIEW
2 1/2
3/4
C
3/8
3/8" DEEP x 3/4" WIDE x 2 1/2" LONG NOTCH
1/4 x 3/4" GROOVE = TO TABLE TOP WIDTH
4 1/4
3/16
28
26
24
2 1/2
10 1/4
16
15 1/4
14 1/2
1/2" TYP.
29 3/4
26 1/4
22 3/4



Shop Trammel

by Gerald H. Koch

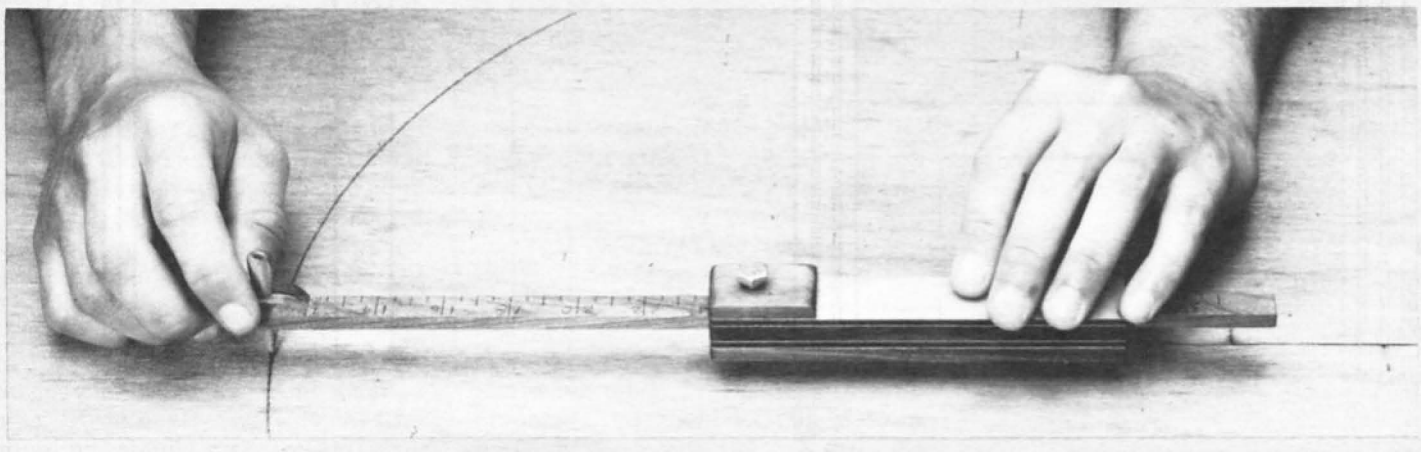
Despite its diminutive size, this little trammel will scribe circles anywhere from 4 to 39 in. in diameter. It is a tool that will take over where the average compass leaves off.

Although our trammel was crafted from walnut, mahogany-core birch plywood, and cherry, other woods can be substituted with equal success.

The secret of this trammel's versatility is a reversible sliding arm (E), used in conjunction with a movable center point pin (I). The trammel is used with either the red side of the sliding arm facing up and the center point pin located at the red line setting (for circles between 4 and 20 in. in diameter), or with the black side of the sliding arm facing up and the center point pin located at the black line setting (for circles between 12 and 39 in. in diameter). The circle's diameter is set by adjusting the sliding arm so that the desired diameter will be even with the end of the trammel body. This is the reading point. If, for instance, the circle is to be 10 in. in diameter, the center point pin must be located in the red setting and the 10 on the red side of the sliding arm must be even with the end of the trammel body.

To make the trammel, first cut the various component parts to size as shown in the illustration. Drill the ⅛ in. diameter screw holes into section A of the trammel body and mortise out for the 6-32 machine nuts (J). The two 6-32 nuts are then set into part A with epoxy glue. The measurements of all parts and the position of these nuts must be exact if the trammel is to be depended on for accurate circles. To make the movable center point pin (I), use a hacksaw to cut the head off of a ¾ in. long 6-32 machine bolt, then sharpen a point on one end and use epoxy glue or solder to join a 6-32 nut onto the bolt as shown. Next, glue part D and top section B together, and drill out the hole to accept the ¼-20 machine bolt and matching T-nut (H). Note that it will be necessary to mortise the bottom of part B slightly so the T-nut will be flush with that surface. Glue together parts E and F to form the sliding arm and using a 9/32 bit, drill out the pencil hole. Next drill out across the arm to accept the 10-24 round-head machine bolt and matching T-nut that will be used to secure the marking pencil. Finally, cut the lengthwise kerf as shown into the end of the arm.

Glue the trammel body assembly together, taking care so the arm will slide easily through without binding. Transfer the illustrated black and red units of measure to their respective sides on the trammel arm, using a black pen for the black side and a red pen for the red side. Also scribe the black and red lines across their respective center point locations as shown on the underside of the trammel body. Finish with a good penetrating oil. WWJ



Jackknife Letter Opener

by A.T. Johnson

Although we have seen letter openers take many unusual shapes and forms, this jackknife letter opener is certain to be an instant conversation piece. It is an ideal project for that special section of scrapwood that was so richly grained you simply didn't have the heart to discard it.

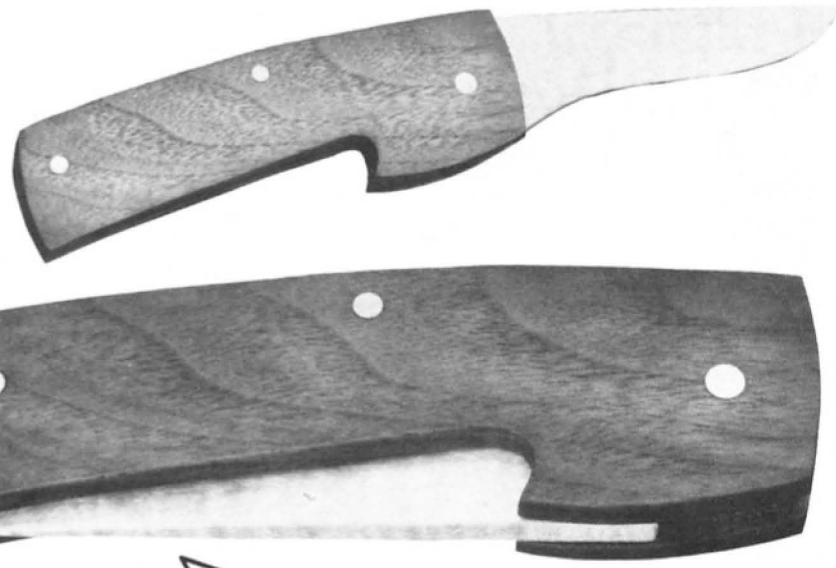
Our letter opener was crafted from walnut and maple, with brass pins. Use only hardwoods, and for contrast make the body assembly and blade from different woods. You may substitute wooden dowels or steel for the brass pins, if necessary.

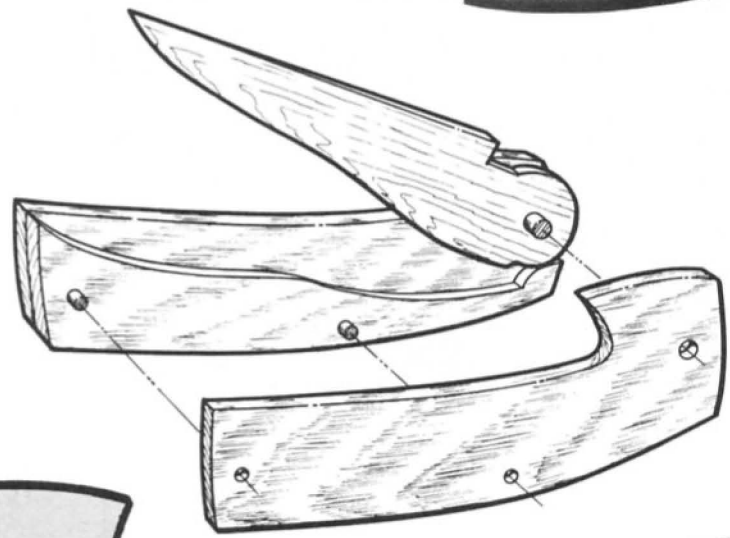
To make the knife, transfer the illustrated patterns to ¼ in. thick stock, and cut out the blanks with either a band, saber, or coping saw. Then, with a file, shape the knife blade to a fine, sharp edge. After rough sanding the blanks, lay out the brass pin locations. Drill out the ¼ in. blade pin hole first. The blade is held firm by a simple cam, and you will probably have to fine tune this cam and the center spacer to obtain the smoothest possible action as the knife is opened and closed. Drill the 3/16 in. pivot pin hole next and dry-assemble the knife.

It is especially important in the assembly that the spacer end rides tight against the blade cam. Set the spacer to provide constant tension on the blade cam, and then clamp the knife end so that when the end pin hole is drilled, the spacer's tension will not be lost.

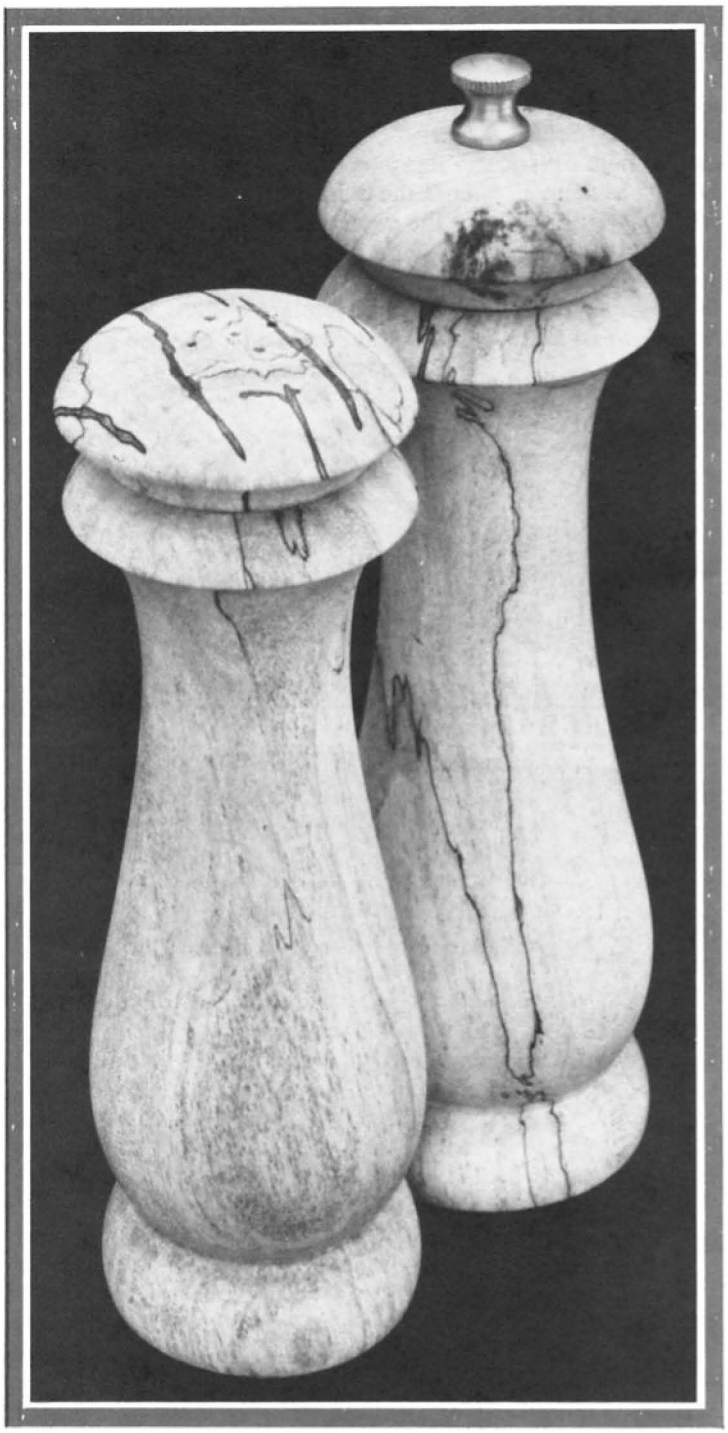
Reassemble the knife, and epoxy both the blade pin and the pivot pin into the two knife sides, being careful to avoid getting any epoxy on either the blade or spacer. The end pin may also be epoxied in place.

Fine sand the knife, and rub to a satin finish with tung oil. WWJ





The Gift Shop



Salt Shaker and Pepper Mill

The Gift Shop

A salt shaker and pepper mill set is always a popular gift item. Store bought wooden salt and pepper sets seem to have a predictable mediocre quality, largely because of the sameness of the wood from which they are made. As a craftsman, you have the opportunity to select a wood that will be truly distinctive. If you are fortunate enough to locate an especially attractive length of wood, such as the finely spalted maple we used, you may just decide to keep the set for yourself.

You will need two turning blocks at least 2¼ in. square and 12 in. long for this project. Since most commercial wood suppliers do not stock material thicker than 2 in., you may need to mail-order the wood turning blocks. Turning squares of cherry, walnut, mahogany, oak, maple and several other suitable woods are available from: Constantine's, 2050 Eastchester Road, Bronx, New York 10461. Telephone: (800) 223-8087.

One other alternative is to make turning blocks yourself, by laminating sections of thinner stock.

Begin this project by trimming the corners off the turning blocks with the tablesaw. Because both the salt shaker and pepper mill have two separate parts — the lid and the body — you must separate each 12 in. long turning square into two smaller squares, 3 in. and 9 in. each in length. This will allow about an inch of waste for cut-offs on either end of each piece. Cutting both the lid and body from the same piece of turning stock will also result in the closest possible grain and color match.

After each piece is mounted in the lathe, round it over with the ¾ in. gouge and then, using a pencil and following the illustrated grid pattern, transfer the high and low intersecting points of the profile to the stock. Use a slow lathe speed for rounding over, and a medium speed for the actual turning.

We recommend using a ½ in. skew chisel for cutting the bevels and a ½ in. round-nose chisel to shape the body. You will note that with both pieces, the lid fits inside the body. Turn the inner flange of the lid to a diameter slightly less than the 1¼ in. diameter hole that you will drill into the top of each body. While each piece is still on the lathe, use sandpaper to remove any chisel lines and apply a fine, smooth finish.

After the 1¼ in. diameter holes have been drilled in the top and bottom of both bodies as shown, you may drill out the 1 in. diameter center holes. Forstner bits used on the drill press are the best tools for these operations. If you do not have a drill press, however, by taking great care you could drill out the holes using an expansion bit and brace. The walls of both the salt shaker and pepper mill are quite thin in places, and if you decide to use an expansion bit and brace, by decreasing the center hole to ⅞ in. there will be less chance of breaking through where the profile is narrowest.

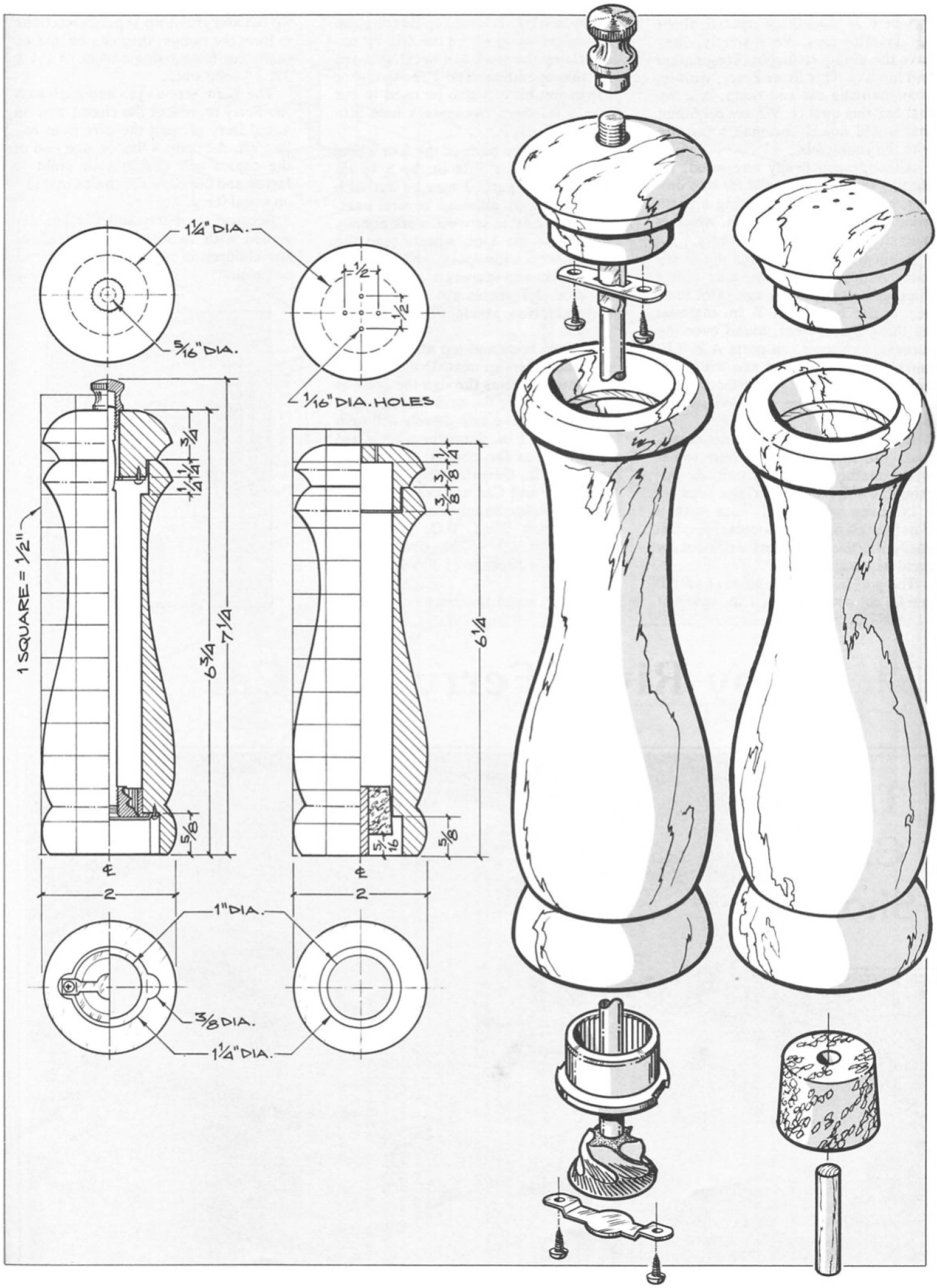
The pepper mill mechanism, costing $6.20, is available from: Woodcraft Supply, 41 Atlantic Avenue, Box 4000, Woburn, Massachusetts 01888. Telephone: (800) 225-1153. Order part no. 16N20-D.

To install the mill mechanism, first drill a 5/16 in. diameter hole through the pepper mill lid. You will need to grind the catch plate ends slightly to match the flange diameter. Next, mortise the bottom of the mill to accept the retaining plate. You may either use a ¼ in. chisel, or drill out the mortise with a ⅜ in. Forstner bit. Install the catch and retaining plates and assemble the pepper mill.

The salt shaker holes are drilled with a 1/16 in. bit, and the shaker top is glued onto the body. The salt shaker stopper is merely a cork sanded to size, and drilled out through the center to accept a section of ¼ in. dowel which is then glued in place. This dowel acts as a tiny knob, facilitating the removal of the cork when the salt shaker needs refilling.

Stain the mill and shaker to suit and finish with tung oil.

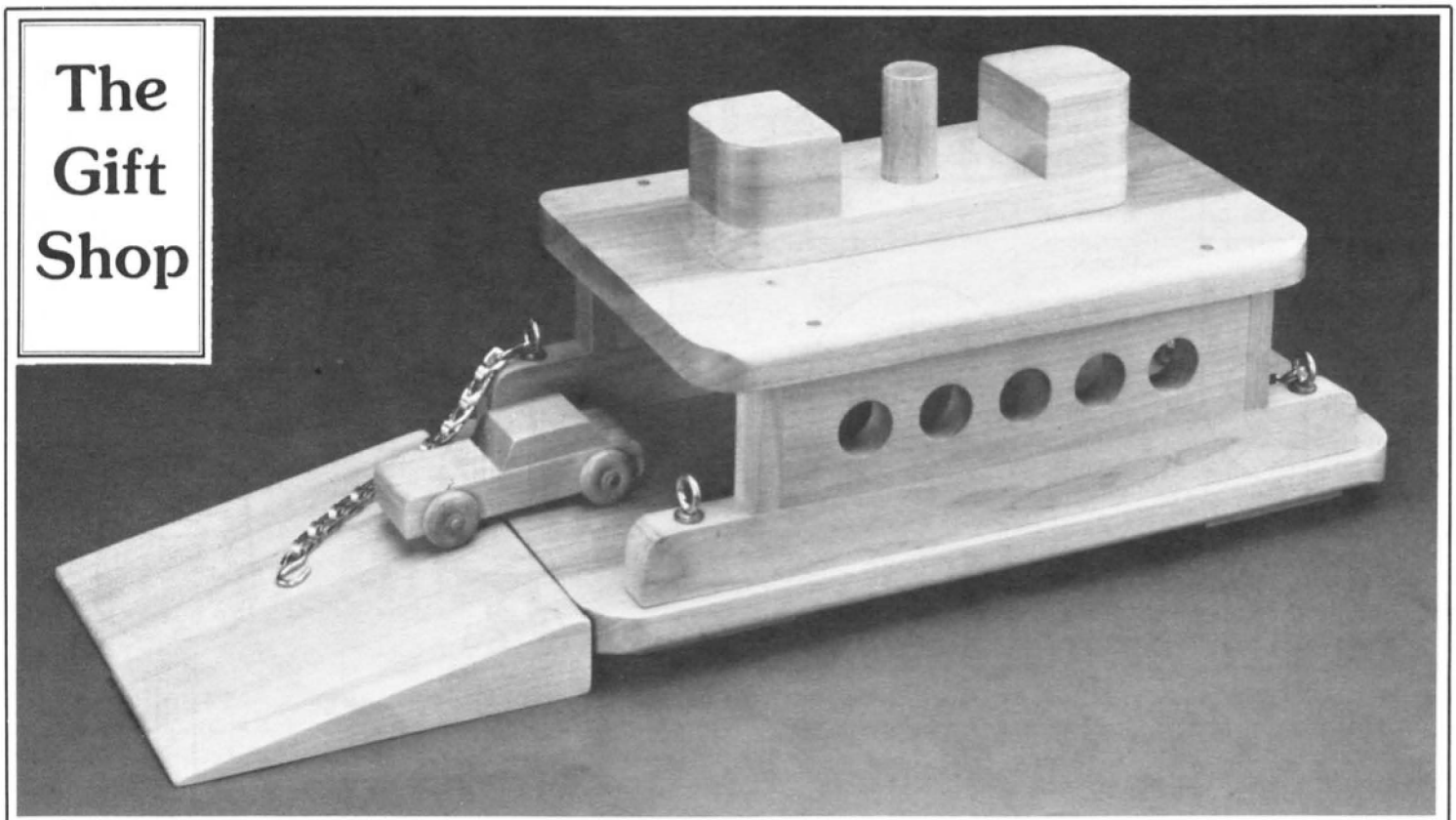
WWJ


1¼" DIA.
5/16" DIA.
1/2
1/2
1/16" DIA. HOLES
1 SQUARE = 1/2"
3/4
1 1/4
6 3/4
7 1/4
5/8
3 1/8
1 1/4
6 1/4
5/16
2
2
1" DIA.
3/8 DIA.
1¼" DIA.

Toy River Ferry and Car

by C.J. Maginley

The Gift Shop



There is something special about favorite toys. Very simply, they have the ability to inspire imagination and fantasy. This River Ferry, with its accompanying car and ramp, is a toy that has this quality. We are confident that it will quickly become a favorite with the young folk.

Although practically any wood, including pine, can be used for this project, we recommend choosing a hardwood such as maple or birch, which is both strong and resistant to nicks.

Begin by cutting to size the Ferry parts A through G. You may either thickness-plane 1 in. rough-sawn lumber, or use mill-finish ¾ in. material for these parts. Next, round over the corners, as shown, on parts A,B,E,F, and G. A saber or band saw will make quick work of this job, although the corners can also be rounded on the bench sander.

Referring to the underside detail, mark the location of the four wheel wells on the bottom of part A. Although we cut the 1½ in. diameter by 1 in. deep wheel well holes with a Forstner bit on the drill press, you can easily mortise the wheel wells out by hand with a chisel.

The port holes in the sides of part D can be cut with either a 1 in. spade or expansion bit. To avoid splintering the side of the wood where the drill bit exits, clamp the stock to a backing board for this operation. The 1 in. spade or expansion bit can also be used to cut the ½ in. deep smokestack hole into the top of part F.

Next, cut the parts of the four wheel assemblies. The 5/16 in. by 5/16 in. axle dado in parts J may be cut with the dado head, although several passes with the table saw will work equally well. Glue the 1 in. wheels onto the axle dowels with epoxy, and glue the axle blocks and spacers in place so that the axle and wheels will ride freely in the dado. Now assemble the Ferry as shown.

The car body and top may be cut to size and glued up next. Drill two 3/16 in. diameter holes through the body as shown, running the drill through several times so the axle dowels will turn easily. The 1 in. diameter wheels are epoxied onto the dowels. The ¼ in. thick by 1 in. diameter wheels for both the Ferry and Car are available from The Toymaker Supply Company, 2907 Lake Forest Road, P.O. Box 5459, Tahoe City, CA 95730. Order wheel No. 15 — a package of 40 wheels will cost $3.50.

Finally, make the ramps. Although we cut and glued up separate sections to form the ramps, they can be just as easily cut from a single block of 1¼ x 3¾ x 7 solid stock.

The ¾ in. screw eyes and chains on the Ferry represent the chains that on a real ferry prevent the cars from rolling off. An open S link on one end of the chains will enable your child to fasten and unfasten the chains just like on a real ferry.

Because the Ferry and Car are designed with toddlers and pre-school age children in mind, we recommend no finish.

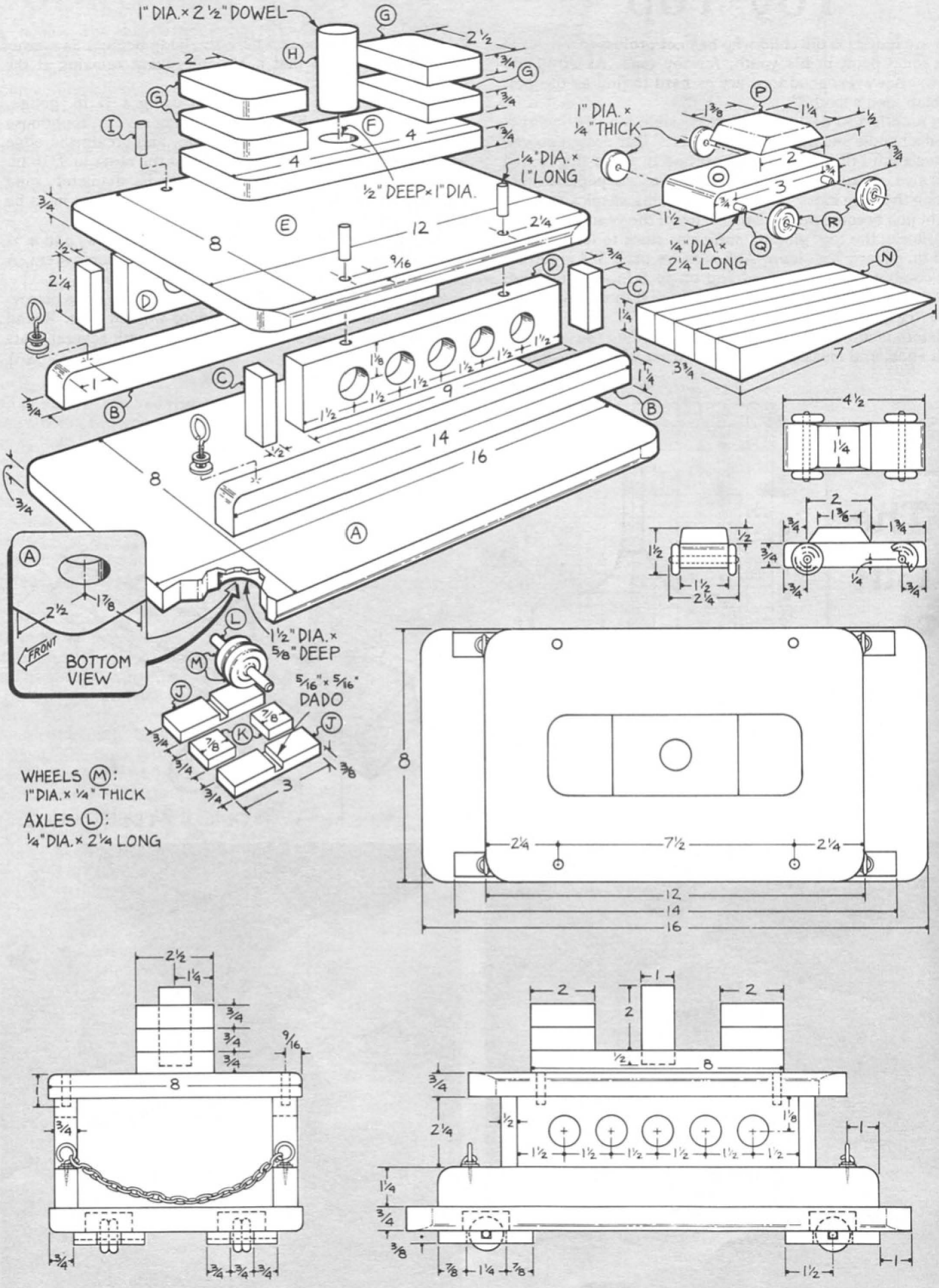
Bill Of Materials
(All Dimensions Actual)

Ferry

Part	Description	Size	No. Req'd.
A	Deck	¾ x 8 x 16	1
B	Rail	¾ x 1¼ x 14	2
C	Trim	½ x ¾ x 2¼	4
D	Side	¾ x 2¼ x 9	2
E	Top	¾ x 8 x 12	1
F	Pilothouse Base	¾ x 2½ x 8	1
G	Pilothouse Top & Center	¾ x 2 x 2½	4
H	Stack	1 x 2½	1
I	Dowel	¼ x 1	4
J	Axle Block	⅜ x ¾ x 3	8
K	Spacer	⅜ x ¾ x ⅞	8
L	Axle	¼ x 2¼	4
M	Wheel	¼ x 1	8
N	Ramp	1¼ x 3¾ x 7	2

Car

Part	Description	Size	No. Req'd.
O	Body	¾ x 1½ x 4½	1
P	Roof	½ x 1½ x 2	1
Q	Axle	¼ x 2¼	2
R	Wheel	¼ x 1	4



Art by E. Marino III

Toy Top

Rare indeed is the child who has not professed a love, at some point in his youth, for toy tops. As any child knows, however, good tops are as hard to find as the proverbial "hen's tooth."

In an effort to design the best possible top, we incorporated a handle and pull string "starter." Our design proved so successful that some pulls resulted in spins that lasted over five minutes. In fact, the top was so popular here among the "big kids," we have a sneaking suspicion that it might just become the executive "toy of the year."

To make the top, glue up sufficient stock to form a 5 in. by 5 in. square 9 in. long. Although we used 5/4 material, any combination of stock adding up to 5 in. will be fine. Since even weight distribution is essential to the top's balance, try to use stock from the same board.

Before mounting the block in the lathe, find the center at both ends, and measure down from what will be the shank end of the top to a point where the body begins. Saw away enough material so that a 1½ in. square remains at the center.

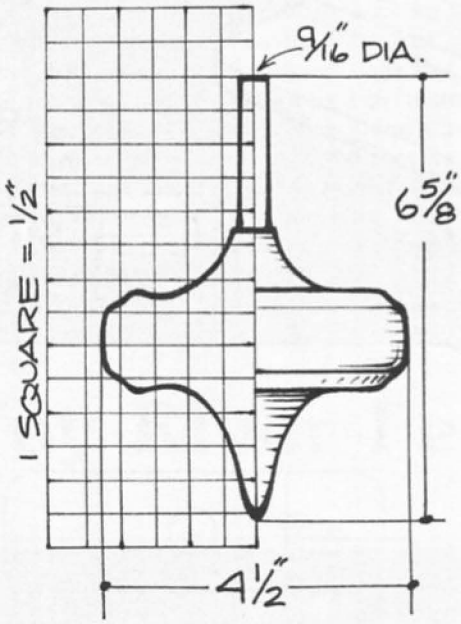
Mount the top in the lathe, and using a ¾ in. gouge, round it over. Turn the body first, using a ½ in. roundnose to undercut both the top and bottom, and create the edge profile. Next, using a skew, cut down the stem to 9/16 in. diameter. After shaping the tip to a ¼ in. diameter, sand the top over and cut off both ends. The center point must be shaped by hand.

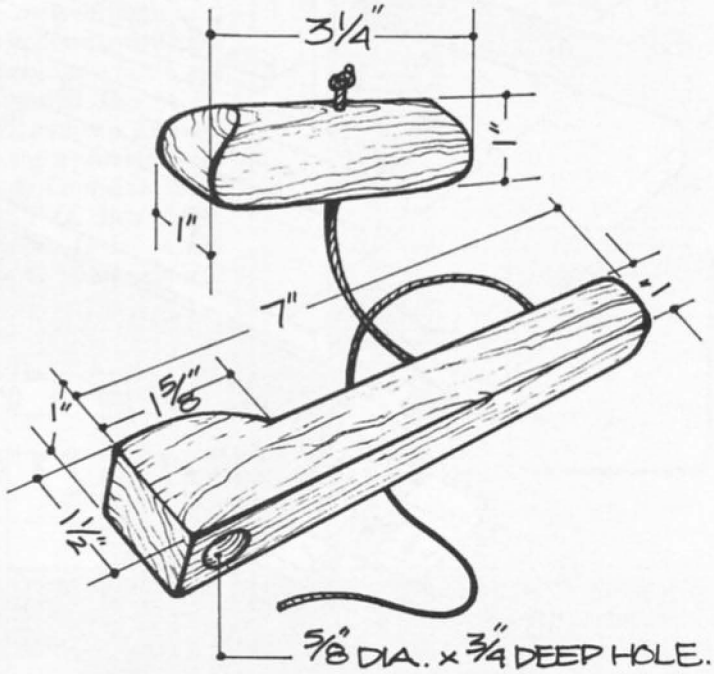
The handle is cut out with a band or saber saw, and a ⅝ in. wide hole is drilled into the end to fit the top's stem. A section of 1 in. dowel will serve as the end pull.

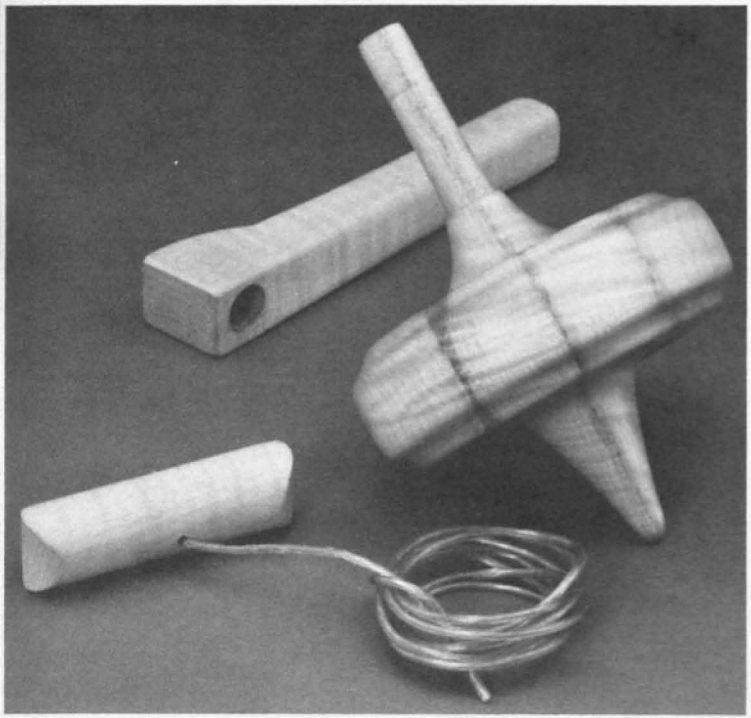
After experimenting with various pull strings, we discovered that plastic-coated speaker wire worked best. Round over the handle edges and finish the top with several coats of tung oil.

WWJ

The Gift Shop







Cookbook Holder

by Victor F. Ptasznik

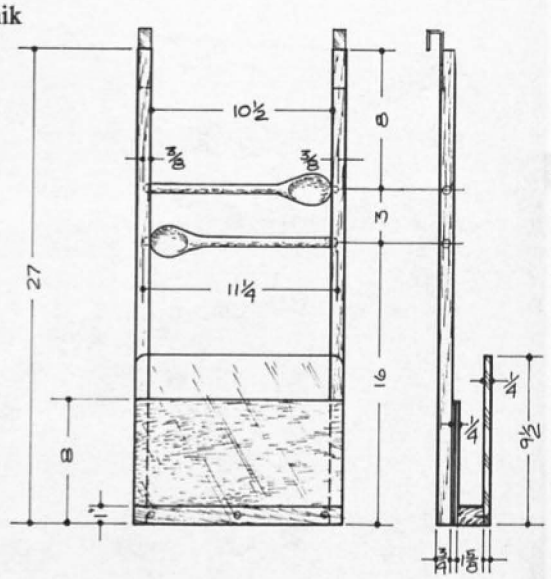
Anyone who has ever struggled with an unwieldy cookbook on a countertop cluttered with baking or cooking ingredients will appreciate how helpful this cookbook holder will be. Our holder is designed to be hung from a cabinet door, far above any countertop mess. The long sides are intended to bring the cookbook down to eye level.

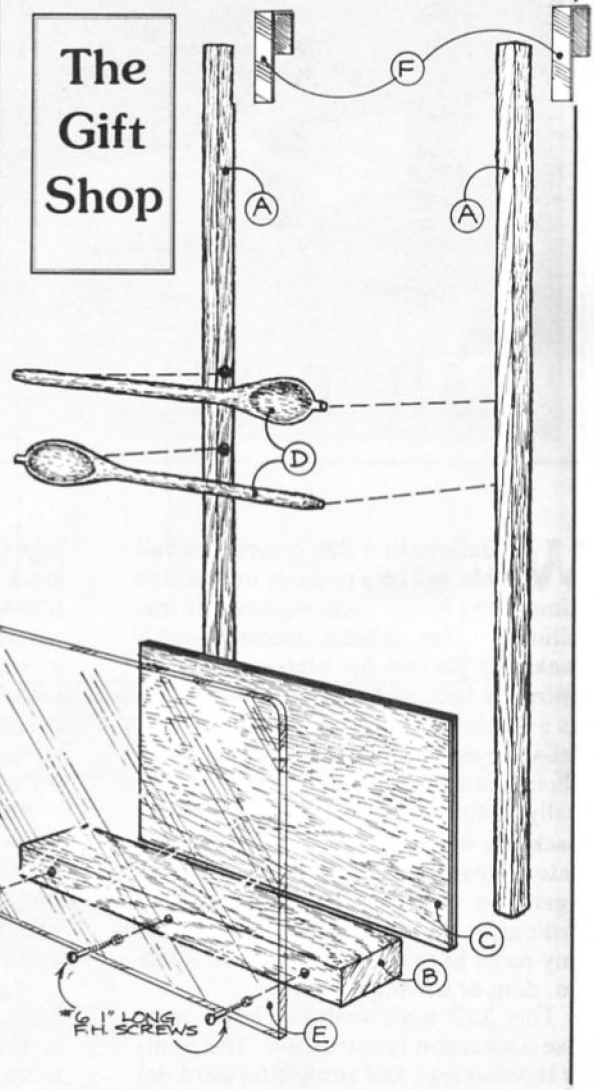
The cookbook holder may be built from 5/4 oak stock, ¼ in. thick birch plywood, ¼ in. thick acrylic sheet, and .032 in. brass sheet. Begin by cutting to size the oak sides (A) and base (B). Next cut the plywood back (C). To make the two oak spoon-stretchers (D), resaw a section of 5/4 stock to ¾ in. thick, then transfer the illustrated grid pattern to the ¾ in. material and bandsaw the two spoon blanks. Shape the spoons with a gouge, and use a drawknife to trim down the handles. Both ends of the spoons are tapered to form ⅜ in. wide tenons, that fit into matching mortises drilled into the side pieces. Note that these spoons are glued in place to serve as decorative stretchers, and are not intended for use as actual spoons.

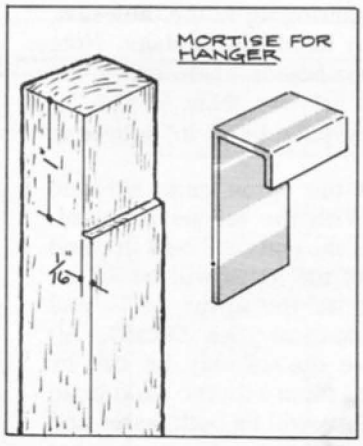
The ¼ in. thick acrylic sheet front (E) may be purchased at glass and plastic supply stores. Round the corners as shown with a disk sander. Using a 5/32 in. bit bore the three holes for the #6 1 in. long wood screws, and countersink each hole so the screw heads will be flush with the front. Assemble the cookbook holder with glue on all mating surfaces *except* where the acrylic front is screwed to the base. When snugging up these screws, keep in mind that acrylic is sensitive to pressure, and likely to crack if the screws are set too tight.

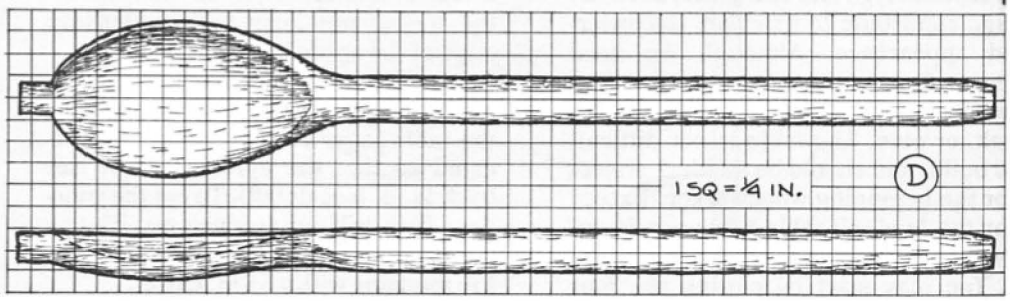
The .032 in. thick brass hangers (F) are an item that must be custom-made to fit your particular cabinet design. Although the hangers are intended to fit over the top of a cabinet door so that the door may then be closed, if your cabinet doors are especially close fitting and there is insufficient clearance for the hangers, the door will need to be left slightly ajar. Mortise the back of each side piece about 1/16 in. deep (see detail) so that the hangers will be recessed to a point where they will not scratch the front of the cabinet door as the cookbook holder is slid into place. The hangers are then epoxied into the mortises. Sheet brass is available at most craft and hobby stores.

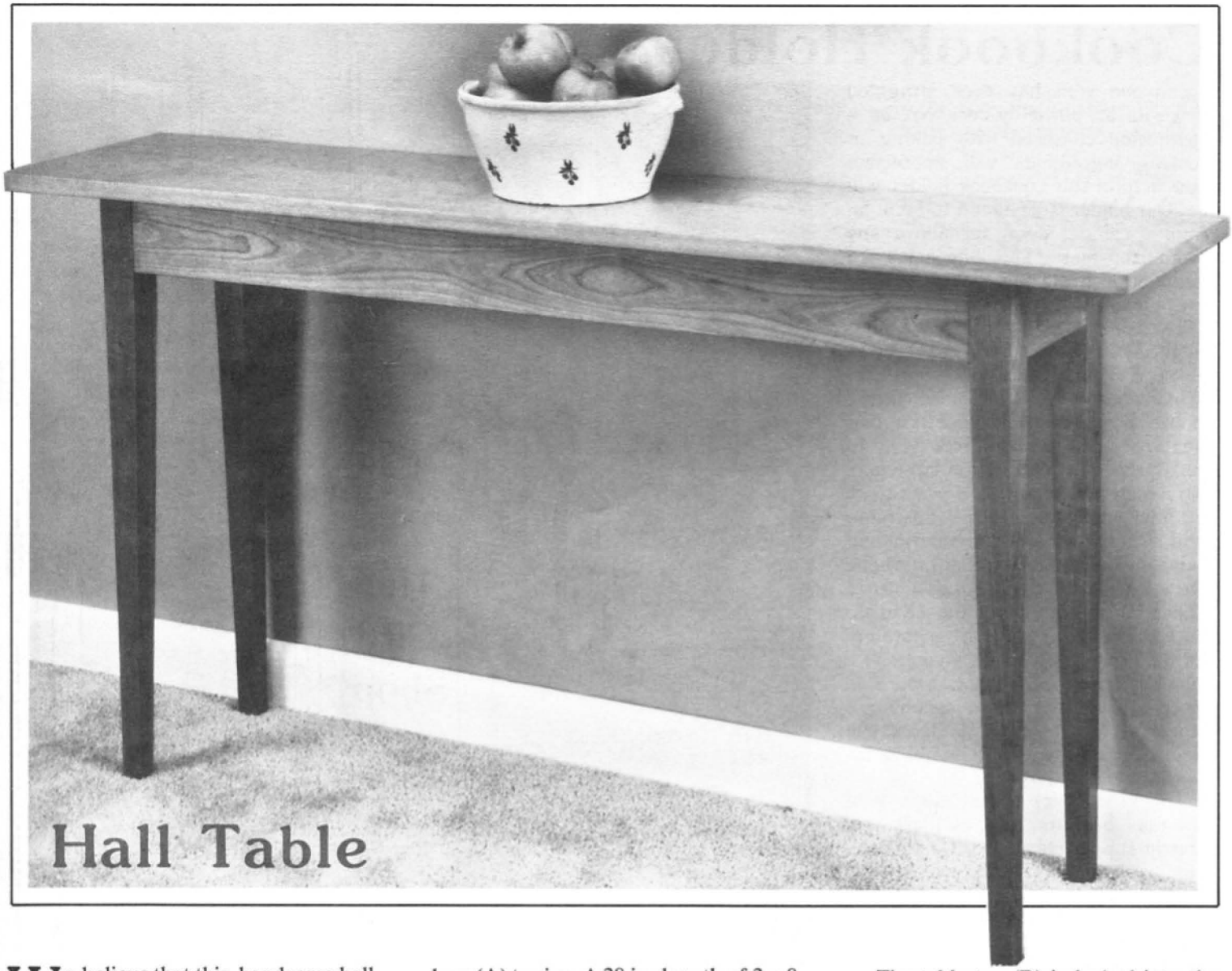
After assembly is complete, stain the holder if desired, and rub in several coats of tung oil. WWJ











Hall Table

We believe that this handsome hall table will be a popular addition to almost any home, contemporary or traditional. The table's narrow width makes it perfect for placement in an entrance hall, and it can easily double as a sideboard or serving table for buffet-style entertaining. Some folks may choose to use it as a sofa table, to visually soften the effect of the sofa's backside when the sofa is centrally located instead of positioned flush against a wall. Indeed, it is an extraordinarily versatile piece in virtually any room in the house, even the kitchen, den, or sewing room.

This hall table features basic mortise-and-tenon construction. The gently tapered legs and straightforward design contribute to its clean, uncluttered appearance. Although we used cherry for this piece, it would also look good in walnut, mahogany, maple, oak, or pine. The table is not difficult to build, and should be an ideal project for the beginning woodworker. Except for the legs, all table parts are ¾ in. thick.

You may start by cutting the four legs (A) to size. A 28 in. length of 2 x 8 stock is ideal for roughing out the leg blanks. The leg tapers may either be cut with a tapering jig on the tablesaw, or shaped by hand with a plane. Note that the taper begins ½ in. below the apron, and narrows from a 1¾ in. square at that point to a 1 in. square at the leg end.

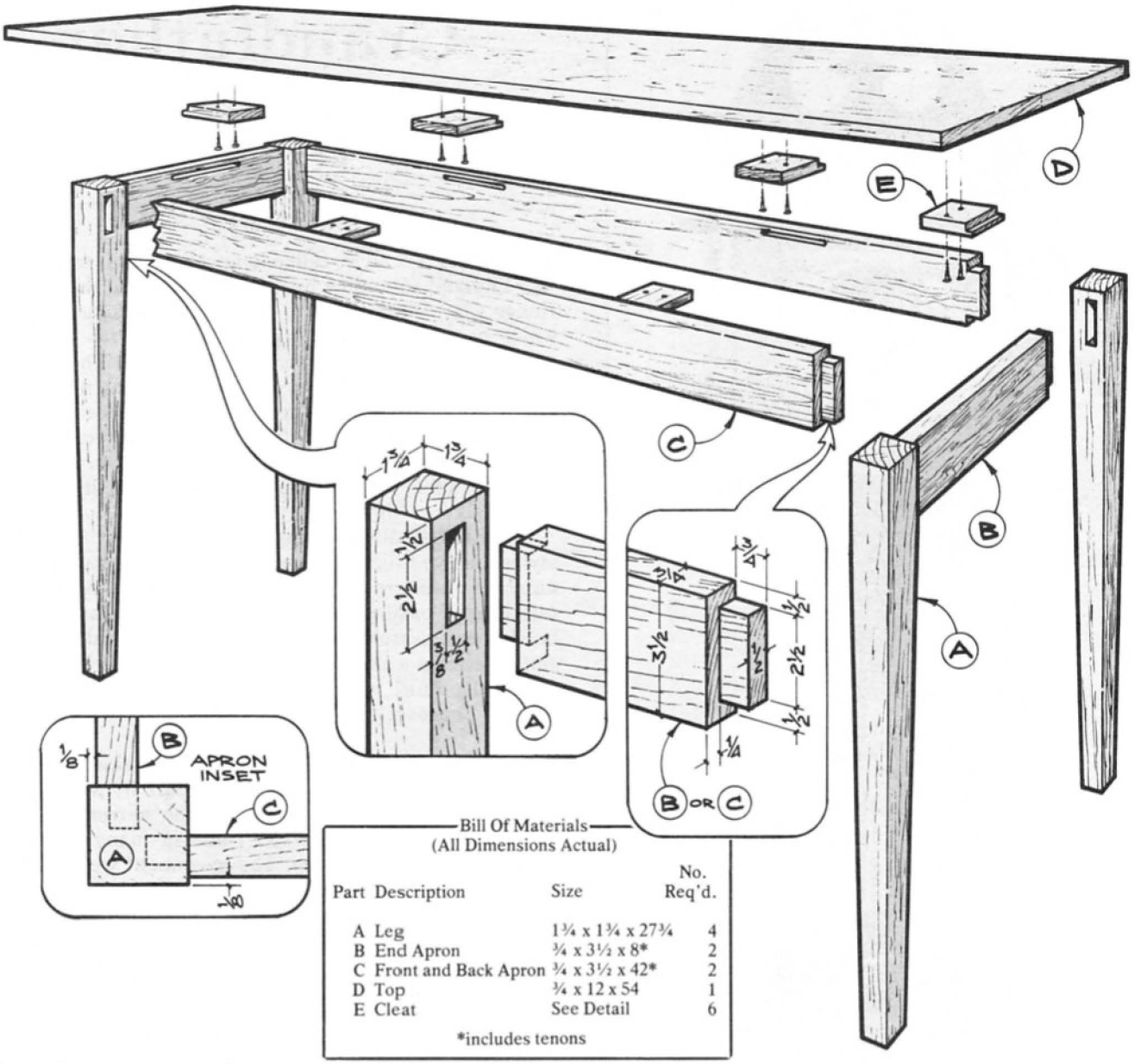
Next, cut the apron ends (B) and sides (C). With the tenons included, the length of the ends will be 8 in., and the length of the sides will be 42 in. The tenons on the apron ends and sides are identical (See Detail). Although these tenons may be cut by hand, cutting them with the dado-head on the tablesaw will be both faster and more accurate. Note, however, that the tenons are flush with the inside edge of the apron boards.

After the tenons have been cut, mark their corresponding mortises on the table legs. These mortises are located so that the aprons will be set back ⅛ in. (see detail). To cut the mortises first drill out as much material as possible with a ½ in. bit; then square the mortises with a ½ in. chisel.

The table top (D) is locked into the apron frame by means of a series of small blocks (E) that are screwed to the table top and mortised into the apron (see detail). The ¼ in. wide by ¼ in. deep stopped dado for each block may be cut with the dado-head. The 2 screw holes in each block should be countersunk ¼ in. so that 1 in. long flat-head wood screws will extend approximately ½ in. into the table top. The table top itself may be a single board, although most folks will probably have to edge-glue narrower stock to achieve the full 12 in. width.

Assemble the table using glue on all the mortise-and-tenon joints of the leg and apron frame assembly, and clamp securely. Do *not* glue the locking blocks into either the table top or apron, however. The design of the table is intended to permit these blocks to ride free in the apron dados, accommodating changes in humidity that will cause the table top to expand and contract.

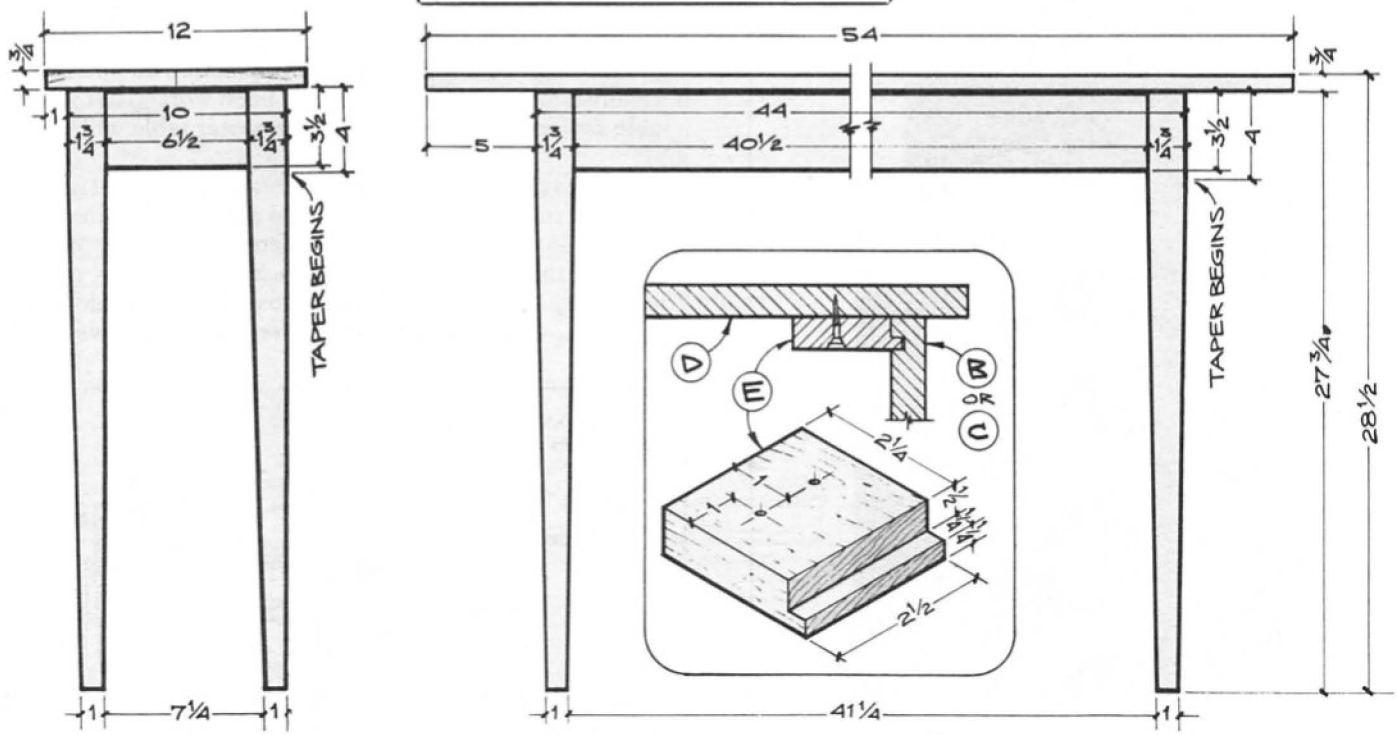
Fine sand the table, and rub in several coats of tung oil to achieve a satin gloss finish. WWJ

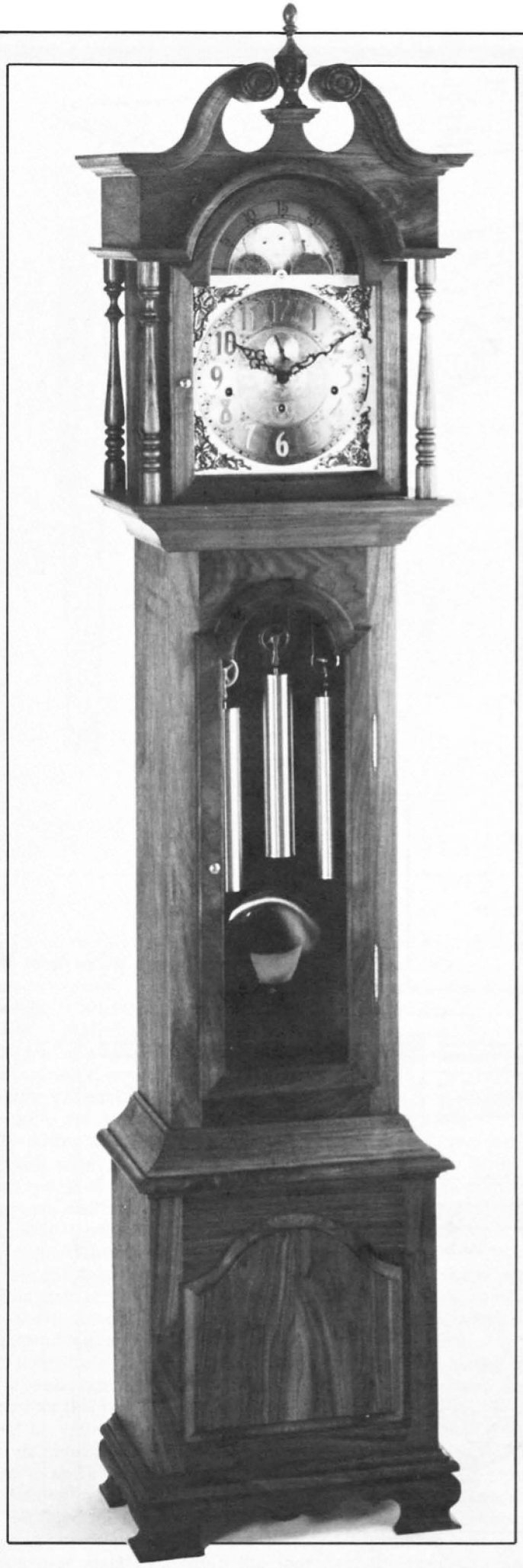


Bill Of Materials
(All Dimensions Actual)

Part	Description	Size	No. Req'd.
A	Leg	1¾ x 1¾ x 27¾	4
B	End Apron	¾ x 3½ x 8*	2
C	Front and Back Apron	¾ x 3½ x 42*	2
D	Top	¾ x 12 x 54	1
E	Cleat	See Detail	6

*includes tenons





Grandfather Clock Part 1

Designed by Roy B. Cook

Clocks of this style, called long case clocks, originated in England sometime before 1660. In 1876, the American Henry Clay Work wrote a song about a long case clock which began: *My grandfather's clock was too big for the shelf so it stood ninety years on the floor...* The song was quite popular in the 1880's, and ever since the name grandfather has become synonymous with the long case clock.

As a general rule, grandfather clocks stand between seven and eight feet tall. A somewhat smaller version, appropriately called the grandmother clock, usually measures around six feet high.

Grandfather clocks come in a variety of shapes and styles, but we think this one is especially handsome. It has a number of interesting features, including ogee feet, a raised arch base panel, arched panels for the waist and hood doors, a broken arch pediment and a calendar moon dial. We used walnut for ours, but oak, cherry, or mahogany is also quite appropriate. In his *Shoptalk* column, on page 4, Jim McQuillan talks about material costs for this project.

In this issue we will cover the construction of the base and waist members. Next issue, in part II, we will detail how to make the hood and install the movement. Movements for grandfather clocks come in many shapes and styles — and price ranges. The movement we specify will cost about $250.00, with the calendar moon dial adding another $150.00. However, some movements can run as high as $1600.00, while those on the lower end of the price range will cost not much over $125.00. More specific movement information, including part numbers and current prices, will be covered next issue.

Making a grandfather clock generally involves using a shaper — a versatile tool, but one that few woodworkers own. We feel that one of the important features of this design is the fact that a shaper is not needed. The operations normally done with the shaper have been worked out so that a table saw molding-head cutter or a router table will do the job.

A router table is easy enough to make (See Fig. 1). Cut a sheet of ½ in. thick birch plywood to a width of 24 in. and a length of 36 in. Bore a 1 in. diameter hole at the center, then make the fence from 1¾ in. thick solid stock as shown. The 1 in. by 1¼ in. notch is cut across the underside of the fence to allow clearance for the cutter. It also allows clear-

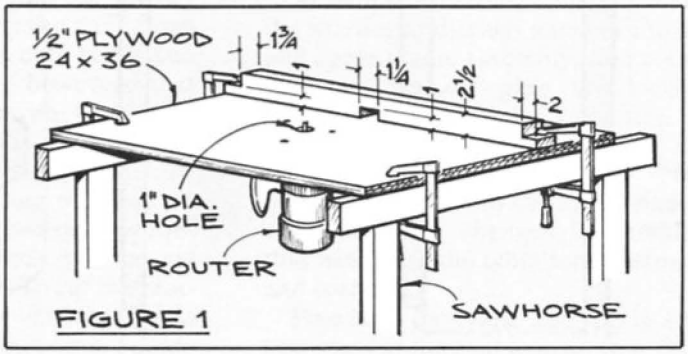
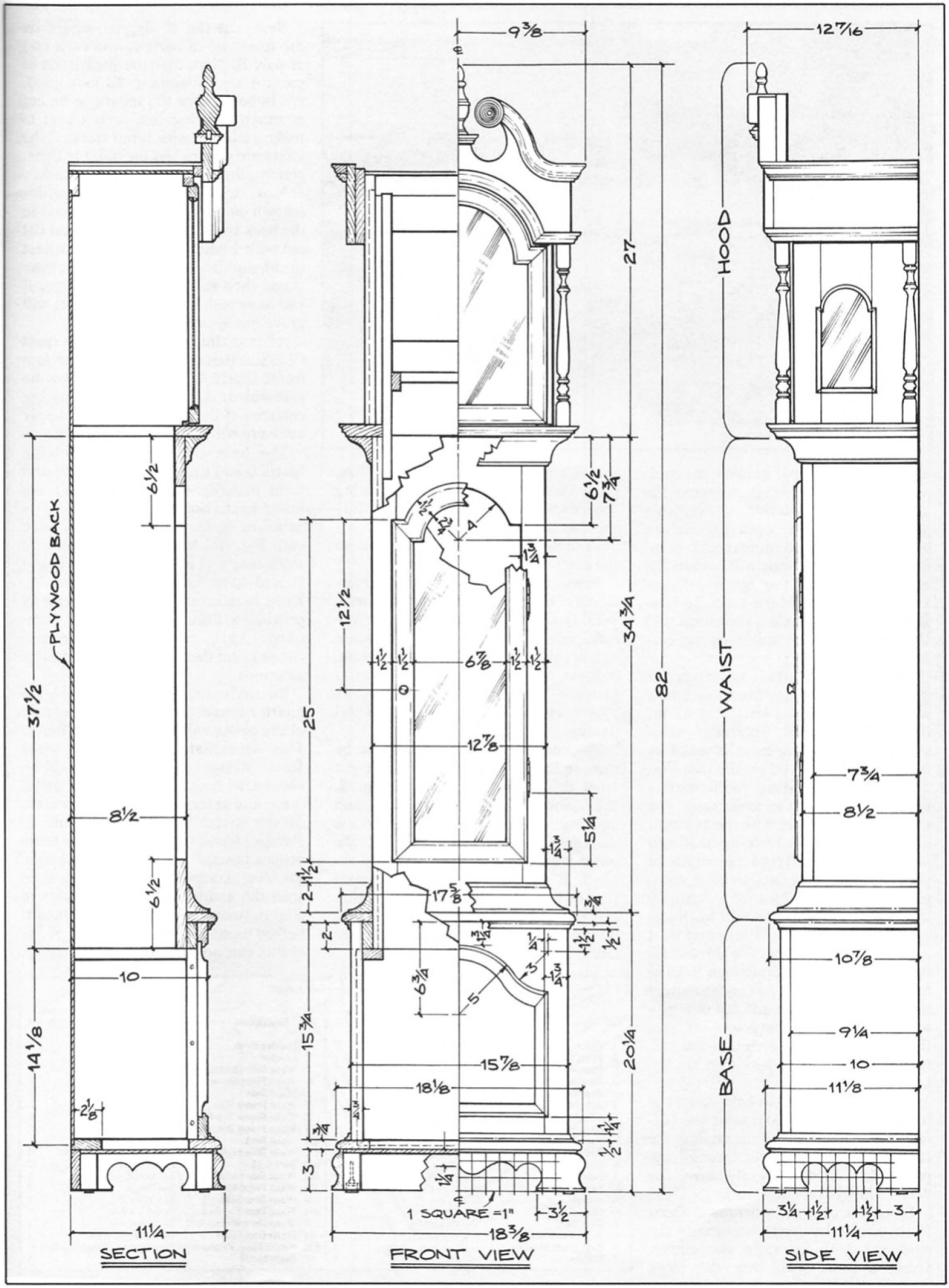
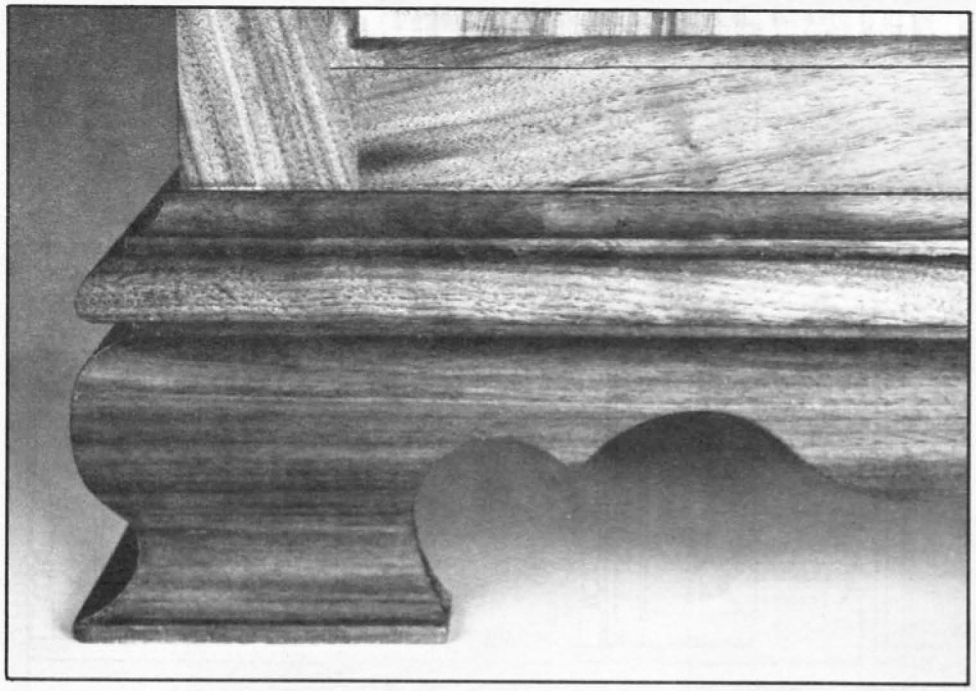


FIGURE 1


SECTION
PLYWOOD BACK
37½
14⅛
6½
8½
6½
10
2⅛
11¼
FRONT VIEW
9⅜
27
82
34¾
25
20¼
12½
6½
7¾
4
2½
2
1¼
6⅜
12⅞
5¼
2
17⅝
¾
1½
2
¼
6¾
5
15¾
15⅞
18⅛
¾
3
1 SQUARE = 1"
3½
18⅜
SIDE VIEW
12⁷⁄₁₆
HOOD
WAIST
BASE
7¾
8½
10⅞
9¼
10
11⅛
3¼
1½
1½
3
11¼



ance for wood chips. Remove the router's plastic sub base, then secure the router to the underside of the table with three screws, each one driven through the top and countersunk ¼ in. Two pairs of C-clamps will secure the router table and the fence to sawhorses as shown. Make sure the sawhorses are sturdy as it's important that the router table be stable as the cuts are made.

The ogee feet (parts A and B) can be made first. Cut ¾ in. thick stock to a width of 3 in. and a length of 42 in. (length dimension includes extra stock). The molding-head is used to cut most of the curved profile (see Fig. 2), but before starting you'll need a plywood inset for the table saw. The metal one that comes with the saw cannot be used with the molding-head and must be removed. Trace the outline of your present insert on a piece of scrap plywood — ¼ in. thick for a Sears 10 in. saw, ½ in. thick for a 10 in. Rockwell Unisaw. Cut the pattern and fit it to the saw, then mount the three 1 in. flute cutters (Sears Craftsman 9-3206) to the molding-head. Lower the cutters below the table, then add the new plywood insert. With the power off, and the cord disconnected, rotate the cutters by hand to make sure they are below the plywood.

Using a push stick to hold down the insert, start the saw and raise the cutter very slowly. Continue raising the cutter, allowing it to cut through the plywood, until it is slightly above the desired height (about ½ in.).

Lower the cutter to a height of about ⅛ in. above the insert, and locate the rip-fence 3/16 in. from the cutter. Using a push stick, run the stock through the cutter to make the first pass. Do this three more times, raising the cutter ⅛ in. after each pass. Making the cut in four passes produces a smooth surface with minimal strain on the saw.

Next, install the ½ in. quarter-round cutters (Sears Craftsman 9-2351) in the molding-head. As before, raise the cutter to its desired height, then rotate the molding-head to make sure they don't hit any part of plywood insert. Cut the radius as shown, again making the cut in several passes.

The remaining material can now be removed using a hand plane. Plane the stock to the profile shown in Fig. 2, then sand smooth. When planing and sanding, be careful not to reduce the thickness to less than ¾ in. at the point where the ½ in. radius is applied. It's important that this curved face of the stock have two points that are ¾ in. thick so that it will rest flat on the table saw when the miters are cut.

Next, cut the 45 degree miters on the front end of parts A and each end of part B. Note that the back ends of parts A are cut square. To look good, it's important for the miters to be cut at exactly 45 degrees, so it's best to make a trial cut with scrap stock. If the joints are square and the miter is tight, you can then proceed to cut the stock.

Now, transfer the curved profiles (shown on the front and side views) to the back side of parts A and B then cut out with a band or saber saw. It's best to cut slightly on the waste side of the stock, then sand exactly to the line. If you have one, a drum sanding set will prove handy here.

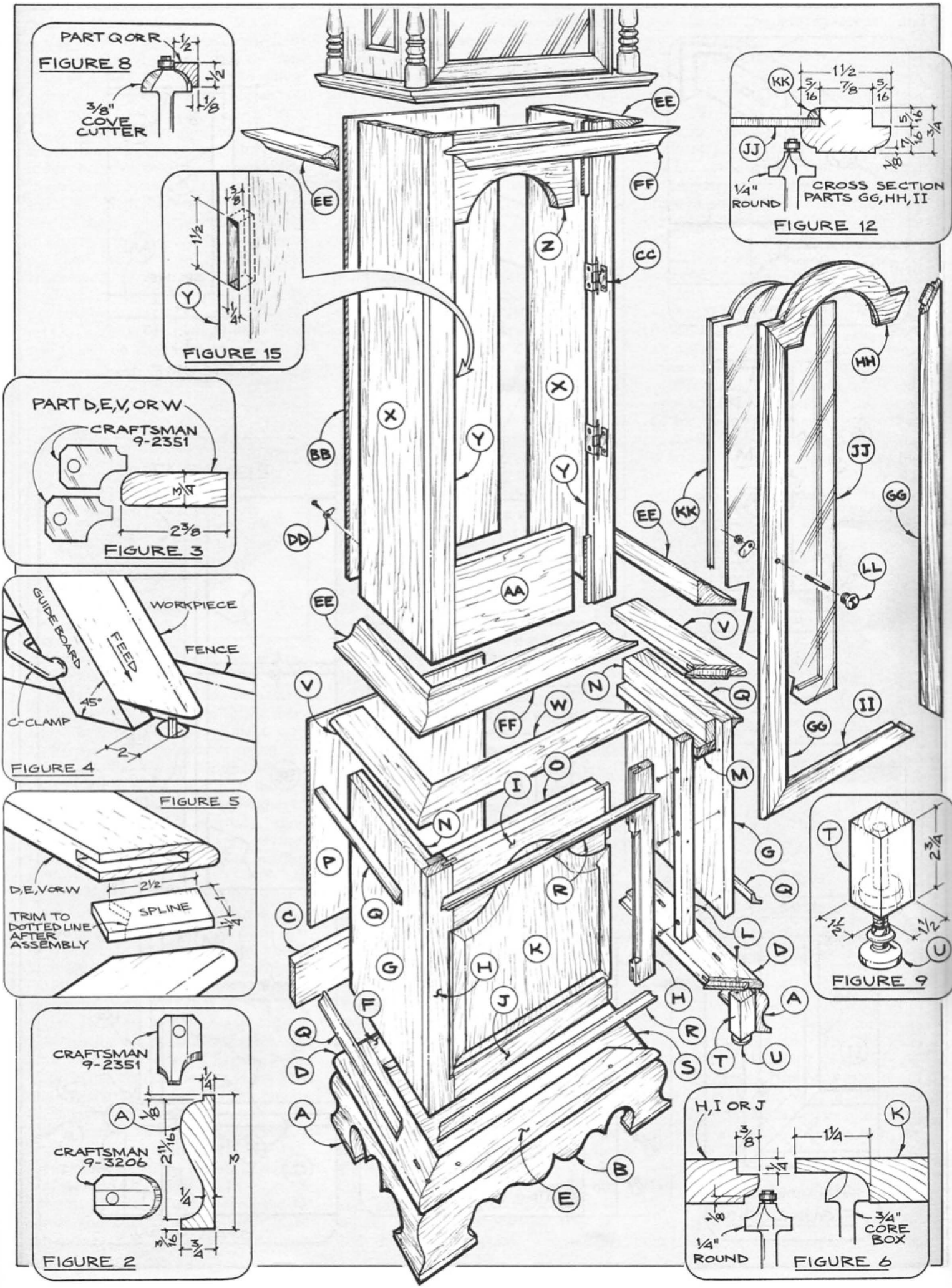
After cutting the foot support (part C) to size (see bill of materials) the foot frame (parts A, B, and C) can now be assembled. Apply glue to the mating surfaces of the four joints, then apply pressure with a pair of web clamps.

The base side and front molding (parts D and E), and the waist side and front molding (parts V and W) are made next. Note that all these parts measure ¾ in. thick by 2⅜ in. wide (see Fig. 3). You'll need a piece of stock that's 41 in. long for parts D and E, and 40 in. long for parts V and W. Keep in mind that both these lengths provide a little extra for later trimming. Again use the molding-head cutter to cut the ½ in. and ¼ in. radius as shown.

To make the cut with the ¼ in. quarter-round edge of the cutter, part of the cutter will be into the rip fence. This necessitates an auxiliary wood fence. Straight square stock should be chosen, as long and high as the metal fence and at least ⅞ in. thick. Secure it to the metal fence with a pair of clamps. Move the wooden fence to its proper position with the cutter below the table. Lock the fence in place, then start the motor and raise the cutter to slightly more than its desired height before backing it off a bit. The ¼ in. radius can now be cut but, as before,

Bill Of Materials
(All Dimensions Actual)

Part	Description	Size	No. Req'd.
A	Side Ogee Foot	¾ x 3 x 11¼	2
B	Front Ogee Foot	¾ x 3 x 18⅜	1
C	Foot Support	¾ x 3 x 16⅞	1
D	Base Side Molding	¾ x 2⅜ x 11½	2
E	Base Front Molding	¾ x 2⅜ x 18⅛	1
F	Base Molding Support	¾ x 2⅜ x 13⅜	1
G	Base Side	¾ x 9¼ x 15¾	2
H	Base Frame Stile	¾ x 1¾ x 15¾	2
I	Base Frame Top Rail	¾ x 5⅛ x 12⅜	1
J	Base Frame Bottom Rail	¾ x 2 x 12⅜	1
K	Base Panel	¾ x 12⅛ x 12¼	1
L	Panel Block	¾ x 1 x 15¾	2
M	Support	¾ x 1½ x 8¼	2
N	Spacer	¾ x 2 x 8½	2
O	Cleat	¾ x 2 x 12⅜	1
P	Base Back	¼ x 15⅛ x 14⅛	1
Q	Base Side Molding	½ x ½ x 10½	4
R	Base Front Molding	½ x ½ x 16⅞	2
S	Bottom	¼ x 9¾ x 16⅞	1
T	Leveler Block	See Fig. 9	4
U	Leveler	See Fig. 9	4
V	Waist Side Molding	¾ x 2⅜ x 10⅞	2
W	Waist Front Molding	¾ x 2⅜ x 17⅜	1
X	Waist Side	¾ x 7¾ x 37½	2
Y	Waist Frame Stile	¾ x 1¾ x 37½	2
Z	Waist Frame Top Rail	¾ x 6½ x 9⅜	1
AA	Waist Frame Bottom Rail	¾ x 6½ x 9⅜	1
BB	Waist Back	¼ x 12¼ x 37½	1
CC	Waist Door Hinge	Craft Products P/N 40406	2
DD	Back Lock	3/16 x 5/8	10
EE	Waist Side Molding	See Detail	4
FF	Waist Front Molding	See Detail	2
GG	Waist Door Stile	¾ x 1½ x 25	2
HH	Waist Door Top Rail	¾ x 4¼ x 9⅞	1
II	Waist Door Bottom Rail	¾ x 1½ x 9⅞	1
JJ	Waist Door Glass	⅛ Thick	1
KK	Plastic Glass Retainer	3/16 Quarter Round	As Req'd.
LL	Brass Latch	⅝ Dia.	1


PART Q OR R
FIGURE 8
3/8" COVE CUTTER
FIGURE 15
PART D, E, V, OR W
CRAFTSMAN 9-2351
2 3/8
FIGURE 3
GUIDE BOARD
WORKPIECE
FEED
FENCE
45°
C-CLAMP
2
FIGURE 4
FIGURE 5
D, E, V OR W
2 1/2
SPLINE
TRIM TO DOTTED LINE AFTER ASSEMBLY
CRAFTSMAN 9-2351
CRAFTSMAN 9-3206
FIGURE 2
1 1/2
CROSS SECTION PARTS GG, HH, II
1/4" ROUND
FIGURE 12
FIGURE 9
H, I OR J
1 1/4
3/4" CORE BOX
1/4" ROUND
FIGURE 6

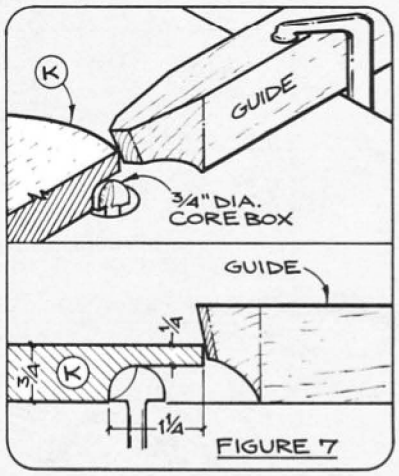


FIGURE 7

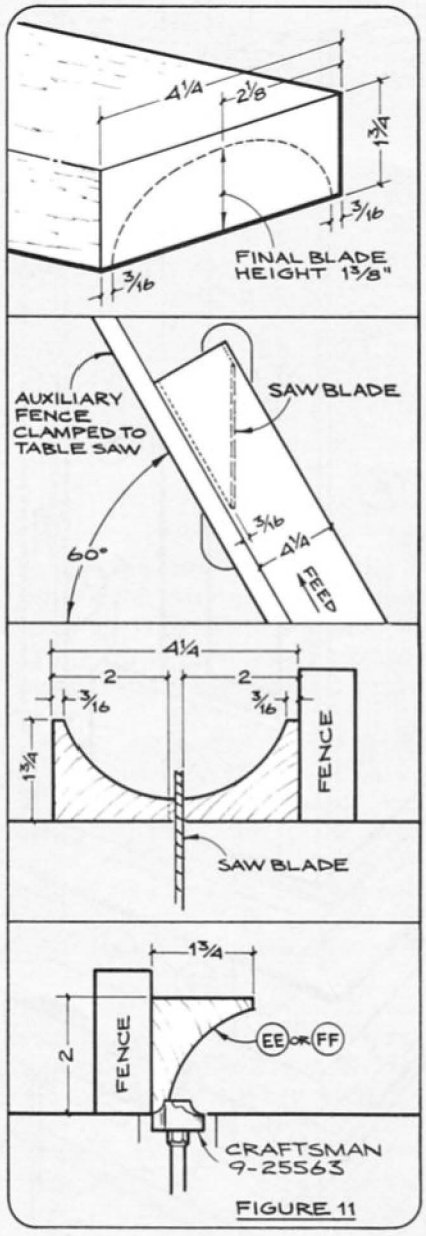


FIGURE 11

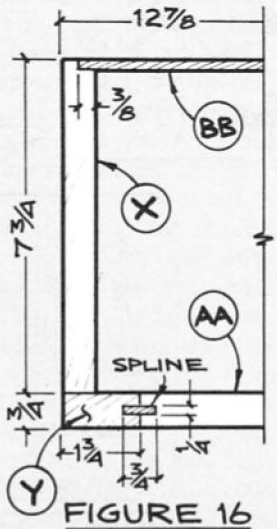


FIGURE 16

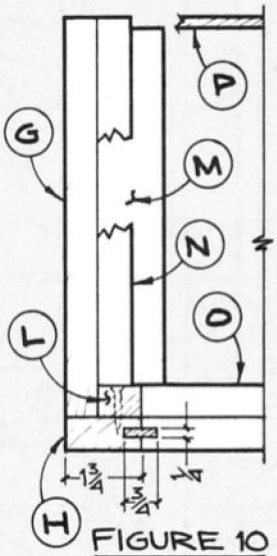
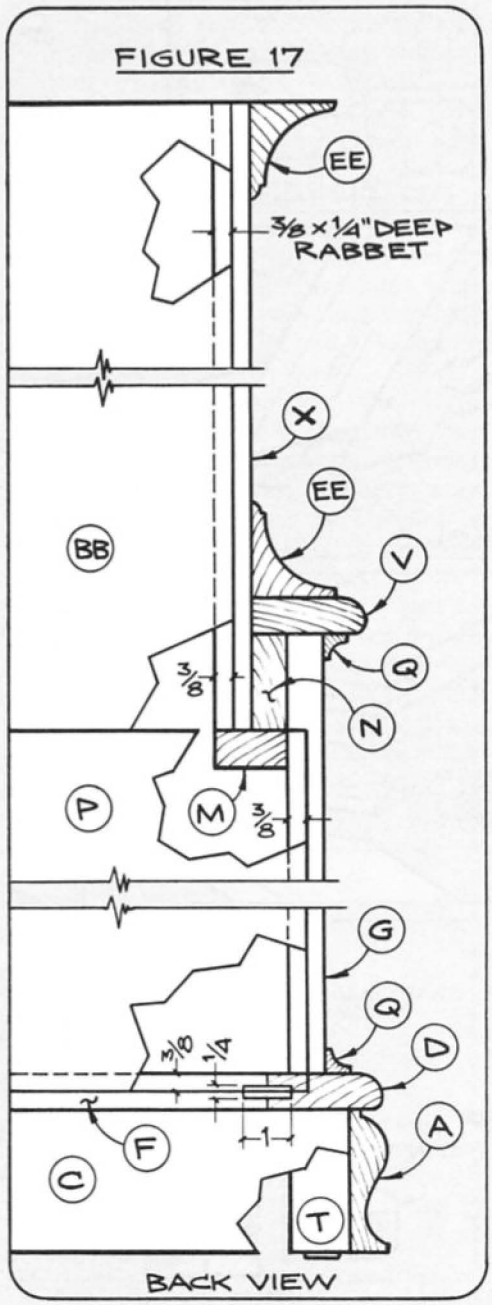


FIGURE 10



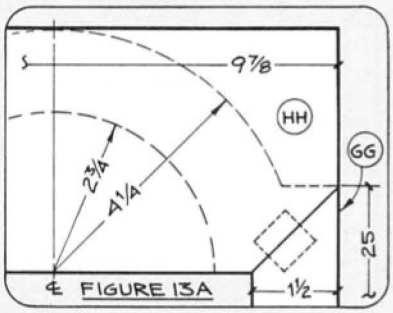


FIGURE 13A

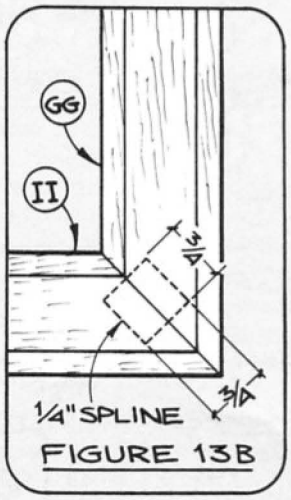


FIGURE 13B

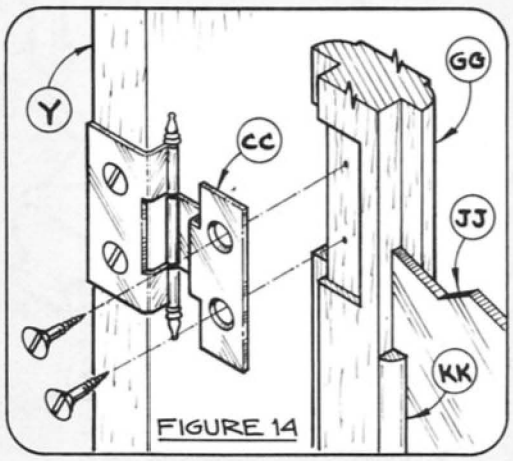
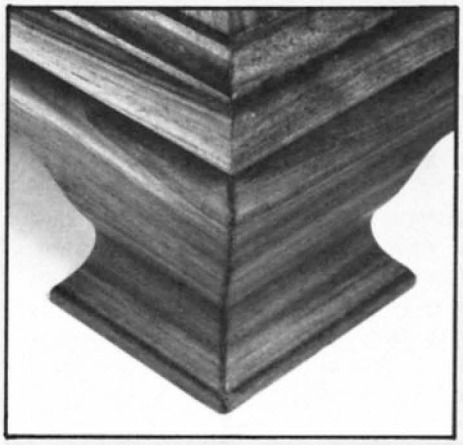


FIGURE 14

do it in several passes.

Cut the 45 degree miter on the front ends of parts D and V, and on both ends of E and W. To cut the spline mortises, a jig is used in conjunction with the router table (see Fig. 4). Use a ¼ in. diameter straight bit set to a depth of ⅛ in. Start the router, then lower the stock into the cutter. When the workpiece comes in contact with the table, push the workpiece forward so that the bit cuts a mortise as shown in Fig. 5. Continue making ⅛ in. deep cuts until the full ½ in. mortise depth is achieved.

The base molding support, part F, can now be made. As shown in Fig. 17, a ¼ in. wide by ½ in. deep spline mortise is cut on each end of part F. A



mating spline mortise is cut on the back ends of parts D.

Parts D, E, and F can now be assembled. Cut ¼ in. splines to fit the mortises, then dry assemble to make sure all parts fit well. Remember to cut the splines so that the grain direction is a right angle to the joint line. If the dry assembly is satisfactory, apply glue to the splines and the mortises, then clamp securely with a web clamp. Check for squareness before setting aside to dry.

After cutting the base sides (parts G) to size, work can begin on the base frame (parts H, I and J). Cut each part to the dimensions shown in the bill of materials, then use the router table to cut the ¼ in. wide by ½ in. deep spline mortises. Note that on the ends of part I, the spline does not go entirely across the 5⅜ in. width of stock. Instead, the mortise is cut 4½ in. long, stopping short of the bottom edge. The mating mortise on parts H are cut to the same length. The spline mortise is also cut short on the ends of parts J, resulting in a length of 1¼ in. The mating mortise on the bottom of part H is also cut to a length of 1¼ in.

Next, on part I, use a compass to scribe the curved profile (see front view, page 51). Use a band or saber saw to cut just outside the scribed line, then use a drum sander to sand exactly to the line.

Cut the splines to size and dry fit parts H, I, and J. If all looks satisfactory, add glue and clamp with bar or pipe clamps. Check for squareness before setting aside to dry.

When dry, remove the clamps and equip the router with a ball-bearing piloted ¼ in. round-over bit (see Fig. 6). Cut the ¼ in. bead all around the inside edge of parts H, I, and J.

Next, equip the router with a ⅜ in. ball-bearing piloted rabbet bit to cut the ¼ in. by ⅜ in. rabbet all around the inside back edge (Fig. 6). Once cut, use a chisel to square the corners.

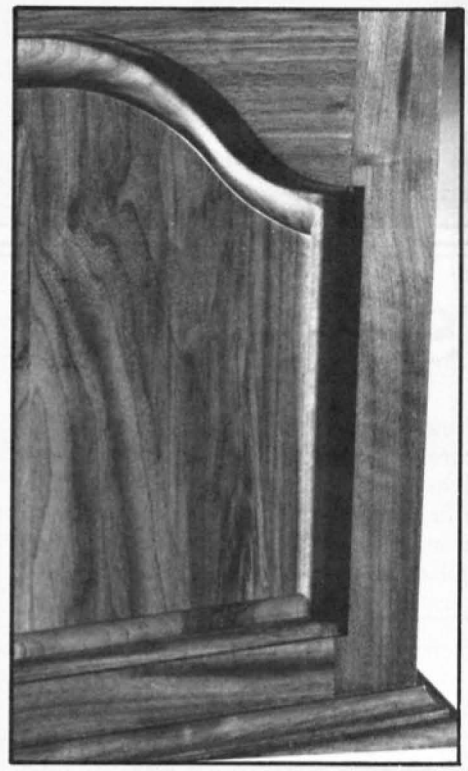
The base panel (part K) can now be made. You'll probably need to edge-join two narrower boards in order to get enough width. Since this panel is a visual highlight of the clock, try to select stock that has a pleasing grain. Edge-join the stock so that you have extra length and width. When dry, rip to final width, then lay the base frame assembly (parts H, I, and J) on the panel and scribe the profile of part I. The panel must actually be ¼ in. larger than this curved line, so use a pencil to scribe a matching, but larger, profile. Cut out with a band or saber saw, staying slightly on the waste side of the line, then sand to the line with a drum sander. The bottom edge of part K can then be cut to final length.

The radius that's cut all around the edge of the panel is made using the router table equipped with a ¾ in. core box bit (see Fig. 6) and a guide clamped to the router table (see Fig. 7). Set the bit to make a ½ in. deep cut, then locate the quide so that the first cut removes about ¼ in. of material all around. After the first cut, relocate the guide and remove an additional ¼ in. of stock. Repeat this process until the 1¼ in. width is achieved. It's a good idea to make some test cuts on scrap material before starting on the panel stock. After completing the radius, check part K for a good fit in the frame (there should be ⅛ in. on the top and sides for expansion), then set aside.

After cutting the waist sides (parts X) to size, the waist frame (parts Y, Z, and AA) can be made. Both parts Z and AA are 6½ in. wide and have ¼ in. wide by 5¼ in. long spline mortises cut in each end. A mating mortise is cut in parts Y. Use a compass to scribe the 4 in. radius curve in part Z (see front view, page 51) before cutting out and sanding smooth. Cut the four splines and dry fit the frame. If satisfied, add glue and clamp with bar or pipe clamps. Check for squareness and set aside to dry.

The waist side and front moldings (parts EE and FF) are made as shown in Fig. 11. Cut 1¾ in. thick stock to a width of 4¼ in. Clamp an auxiliary fence (at 60 degrees) to the saw table. With the saw blade set to a height of 1⅜ in. note that the fence is located 3/16 in. from the blade. Lower the saw blade to a height of 1/16 in., then pass the stock through the blade. Flip the stock, end for end, and make the same cut. Raising the blade in 1/16 in. increments, continue this process until the final blade height of 1⅜ in. is reached. To be sure your set up is accurate, it's a good idea to make a practice run on a short piece of scrap pine.

Once the cove is cut, rip the piece to a width of 2 in., then final sand. Next, use the router table and a ¼ in. beading bit (Sears Craftsman 9-25563) to cut the bead along one edge. Note that the cutter is used without the arbor (pilot).



The waist door (parts GG, HH, and II) can now be made. Cut each part to size, then add the 45 degree miters as shown in fig. 13A and 13B. The mortises for the ¼ in. thick splines are cut using the same jig that was used to cut parts D, E, V, and W (Fig. 4). However, the final cutter height setting will be ⅜ in., and the dimension from the guide board to the outside cutter edge will be 1¼ in. Also you'll need to clamp a stop block to the table to limit the mortise length to ¾ in.

Apply glue to the splines and the mortises before assembling with bar or

pipe clamps. Check for squareness before setting aside to dry.

Once dry, remove the clamps, then use a compass to scribe the inner and outer radii on part HH. Cut out on the waste side of the line, then sand smooth with a drum sander.

To cut the front bead on the inside and outside edges of the waist door parts, equip the router table with a ¼ in. bead bit that has a ball-bearing pilot (see Fig. 12). The back rabbets are cut with a ball-bearing piloted 5/16 in. rabbet bit.

Assemble parts G to parts H using glue and clamps. To keep the parts from sliding as the clamp pressure is applied, it's a good idea to first drive two or three small brads in part G, then clip the heads off so 1/16 in. is exposed.

Apply three or four coats of a good penetrating oil to the base panel (part K) before installing it to the base frame (parts H, I, and J). Parts L, which serve to hold the panel sides in place, can now be glued and screwed as shown. Part O, which secures the panel at the top, is also added now.

Glue and clamp parts N to parts G so that the top edges are flush. When dry, parts M are glued and clamped to parts N and G.

Cut part T to the dimensions shown in Fig. 9, then bore holes to accept the leveler (part U). Glue and clamp part T in place, locating it ¼ in. from the top edge of A and B. The bottom (part S) can now be cut to size, given several coats of penetrating oil, and dropped in place.

Apply glue to the top edge of parts A and B, then attach the base molding frame (parts D, E, and F) with 1¼ in. long no. 8 flat head wood screws (FHWS) driven through the frame and into the tops of the leveler blocks. Be sure to locate the screws at a point that will not show after the addition of the part Q molding.

Place the partially assembled waist on top of parts D and E and scribe a pencil line to indicate the proper position of parts G and J. Remove the waist and, with the lines as a guide, bore screw holes down through parts D and E. Note that the screw holes in parts D are slotted. Add glue to the bottom edge of parts G and J, then join to parts D and E with 1½ in. by no. 10 FHWS driven up through the bottom.

After joining X to Y, the waist can be joined to the base. Apply glue to the mating surfaces and clamp firmly.

When dry, add glue to the inside edges of parts V and W and slide in from the front. Clamp firmly.

Moldings Q and R (see Fig. 8) can now be cut and applied with glue and several small brads, countersunk and filled. The lower parts EE and FF are added in the same manner, however the upper ones won't be applied until after the hood is added — which will be covered next issue.

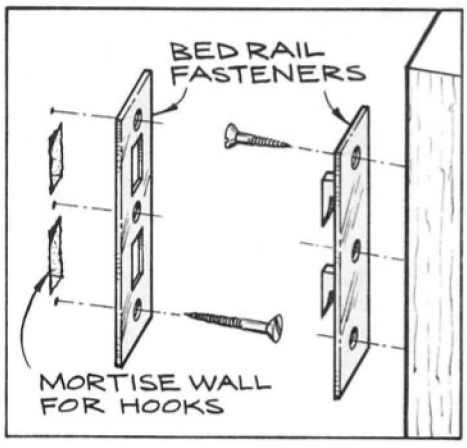
All of the hardware for the base and waist sections can be ordered from Craft Products Co., 2200 Dean Street, St. Charles, Ill. 60174. The leveler (U) is p/n 43100, the waist door hinge (CC) is p/n 40406, the back lock (DD) is p/n 42800, the plastic glass retainer (KK) is p/n 43601, and the brass latch (LL) is p/n 40708.

The waist door hinge (part CC) is mortised to part GG, but not to part Y (see Fig. 14). As shown in Fig. 15, a mortise is cut to accept the brass latch (part LL). The glass (part JJ) is cut to fit the door frame and held in place with plastic glass retainer (part KK).

Next issue we will cover the construction of the hood and discuss how to order and hang the movement. You'll need a lathe to do the four spindle turnings, but the remaining operations can be done with equipment already used in the base and waist construction. WWJ

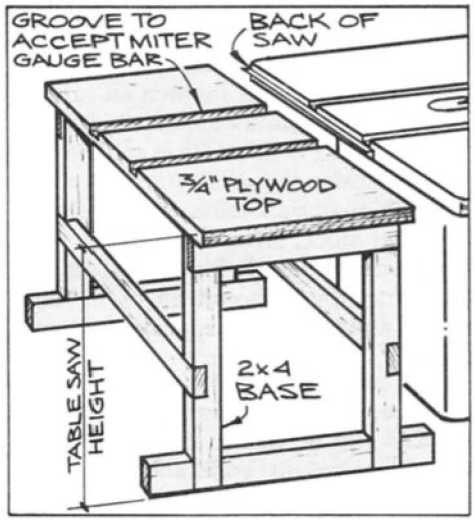
Shop Tips

Heavy wall-hung cabinets can be securely attached to a wall using bed rail fasteners. Screw the slotted half of the fastener to the wall, making sure the screw is into a stud, then cut a small mortise behind each slot. The



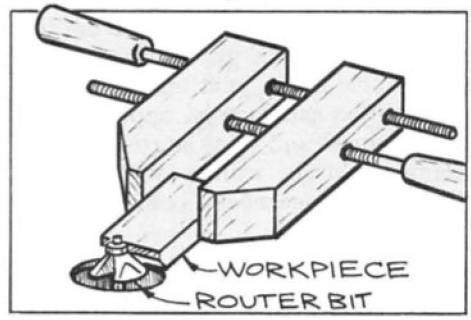
mating half is screwed to the cabinet. If desired, each half can be let into a mortise, permitting the cabinet to fit tightly against the wall. Bed rail fasteners are available from a number of mail order woodworking suppliers.

Stock that's long or wide can be cut easier and safer with the aid of a table saw support table. One can be made simply enough by using ¾ in. thick plywood for the top and 2 by 4 stock for the base. Since it is not attached to the saw table, it is adaptable to any table



saw design. A pair of grooves are cut (using the dado-head cutter) to allow the miter gauge bar to run onto the support table. These grooves can be cut considerably wider than the table saw miter gauge slots in order to make it easier to align the two tables.

When working with small parts, a hand screw used as shown will help keep hands a safe distance from the router table or shaper cutters.



Brass pins, glued in place with epoxy, can be used as an attractive detail when substituted for small diameter dowel pins. However, small diameter round brass stock is not commonly available. A suitable alternative, though, is to apply epoxy glue to brass screws, then screw them in place and sand the heads off with a belt sander.

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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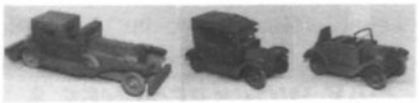

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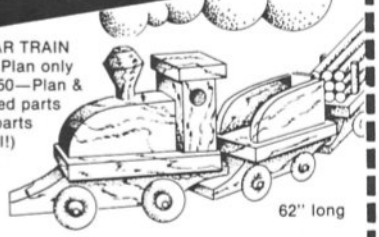

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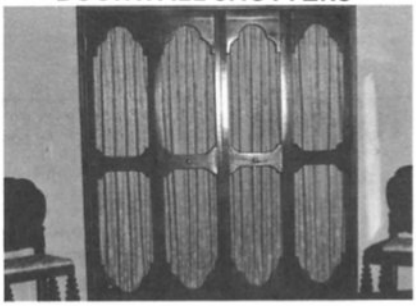

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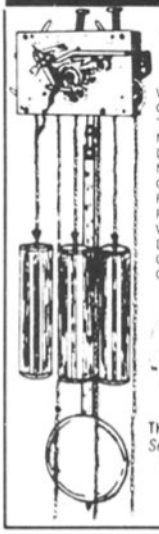

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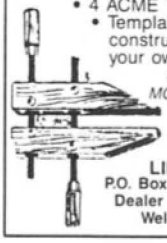

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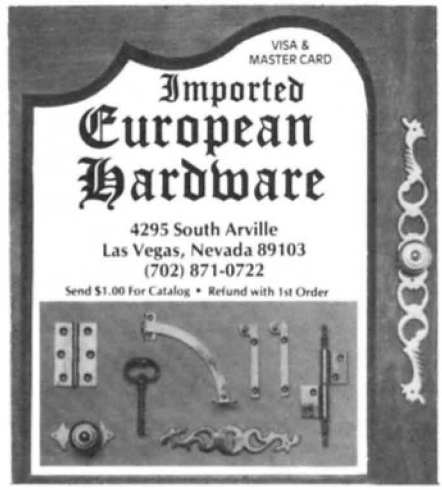

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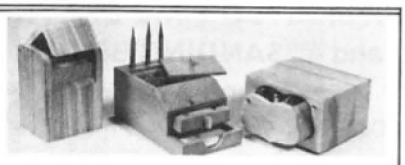

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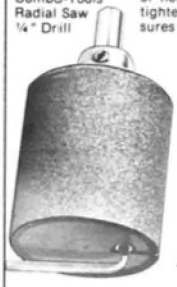

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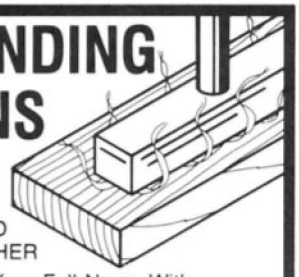

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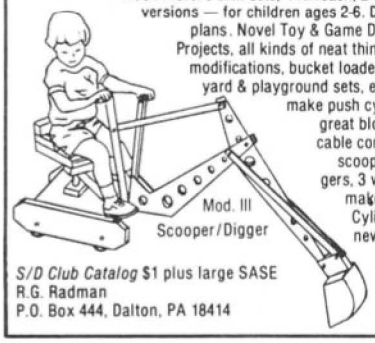

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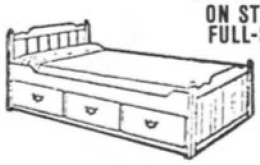

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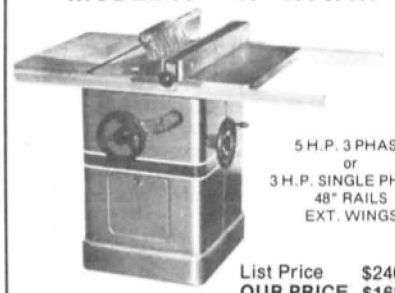

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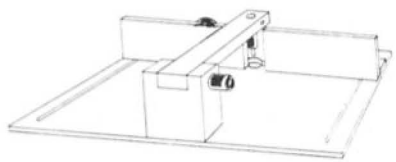

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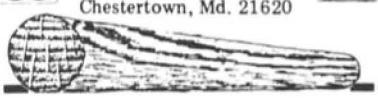

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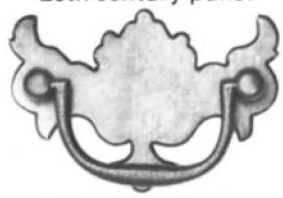

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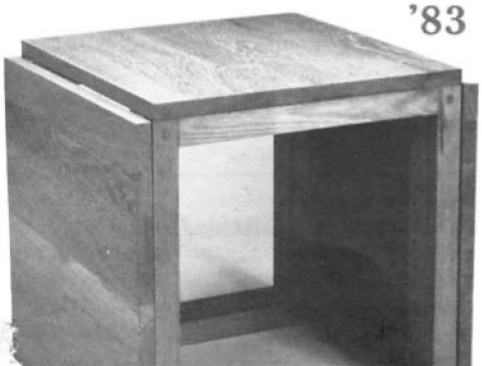

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