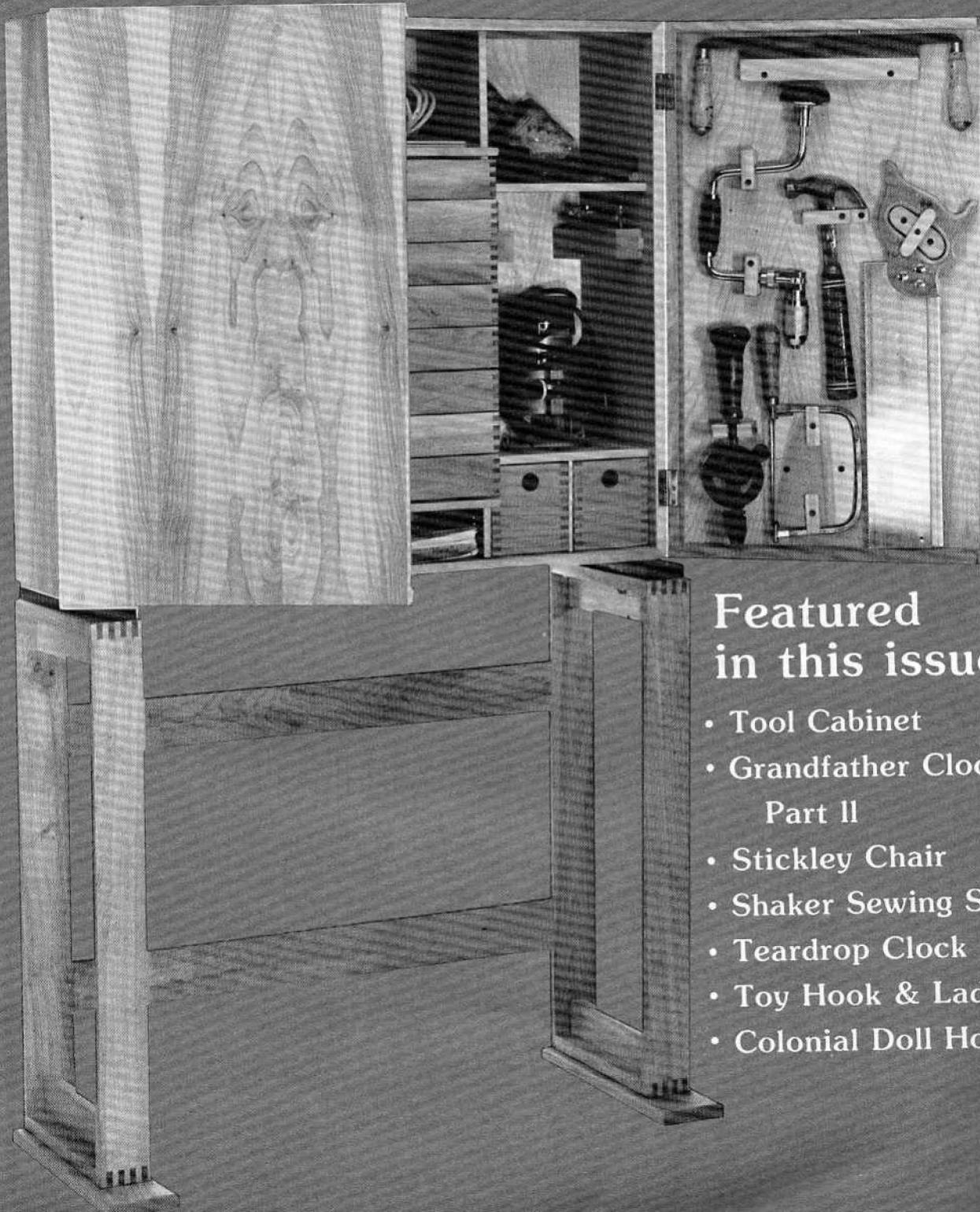


# The Woodworker's Journal

Vol. 8, No. 6 \$2.50



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- Tool Cabinet
- Grandfather Clock,  
Part II
- Stickley Chair
- Shaker Sewing Stand
- Teardrop Clock
- Toy Hook & Ladder
- Colonial Doll House

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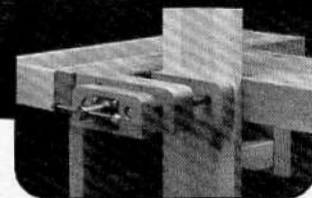
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# The Woodworker's Journal

VOLUME 8, NUMBER 6  
NOVEMBER/DECEMBER 1984



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The Woodworker's Journal (ISSN 0199-1892) is published bi-monthly in January, March, May, July, September and November by The Madrigal Publishing Co., Inc., P.O. Box 1629, New Milford, CT 06776. Telephone: (203)-355-2694.

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Second class postage paid at New Milford, CT 06776 and additional offices.

#### Subscription Rates

In the United States and its possessions:  
One year (6 issues) \$12.00  
Two years (12 issues) \$22.00

Canada and other foreign:  
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Two years - \$26.00

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#### Contributions

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

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# Shoptalk

## A Project Index

Here's good news for those many readers who have been vexed by the increasing difficulty of locating a specific project from our growing back issue listing now found on pages 32 and 33. We have finally prepared a project and department index for all issues from September 1980 and this will appear in the January/February 1985 issue. It includes not only all past projects but also the information contained under the department headings such as *The Beginning Woodworker*. Our thanks to the Advertising Manager Kim Gellatly who volunteered time for the index project and came to grips with the problem of categorizing such items as a back massager and laminated shoehorn (they are included under the heading of Personal Accessories).

In addition to this index, we are also preparing an extensive catalog type of index which will include photos and descriptions of each and every project since September 1980. This catalog will be available later in 1985.

## Classic Furniture Plans

We have been getting more and more requests for plans to reproduce specific styles of fine furniture such as Queen Anne, Hepplewhite or American Mission. In response we are now including in each issue the plans for a piece which

can be considered a good example of a particular classic style. Each plan will be prefaced by a history of that style and how it evolved. This issue starts the series off with the American Mission style which, in recent years, has become very popular with antique collectors. I think you'll find the historical background both interesting and informative. The plans were developed from an original chair by Gustav Stickley whose name has become synonymous with the Mission style. In the works are reproductions in the Sheraton, Queen Anne and Hepplewhite styles.

## Toy Top Warning

In the last issue we showed the plan for a super toy top that will keep spinning for an amazingly long time. What we failed to mention in our enthusiastic description was the fact that the top, once it settles down in its spinning, will actually start drilling a hole in any surface softer than the hard wood from which the top is made. When making the top, be sure to round off the nose as shown in the photograph. Even with a rounded nose, enough friction is generated to melt through the protective wax coating on linoleum flooring. If you've got wall-to-wall carpeting or are concerned about the kids getting a bit carried away with the top, the best approach is to provide a 3 foot square "landing field" of thin tempered hardboard.

*Jim McQuillan*

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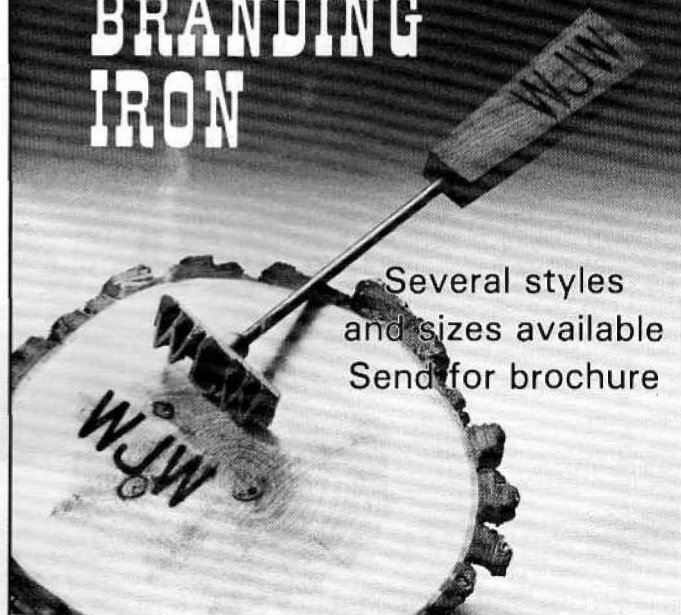
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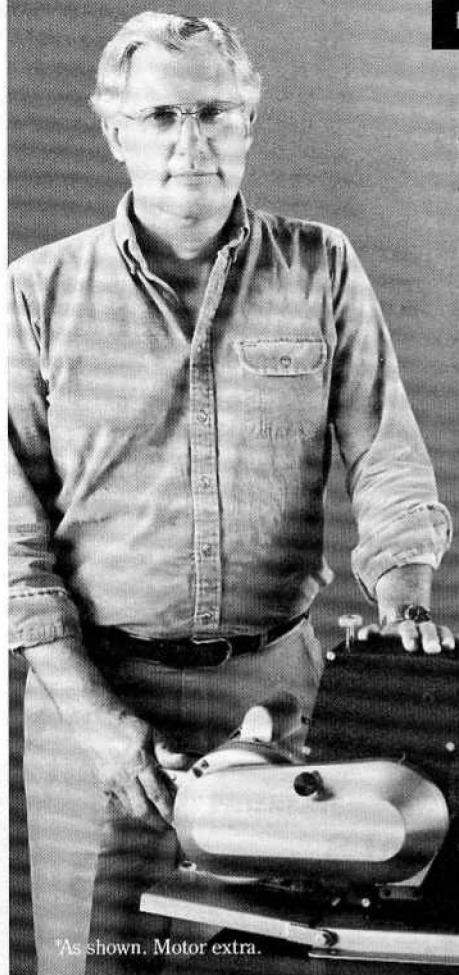


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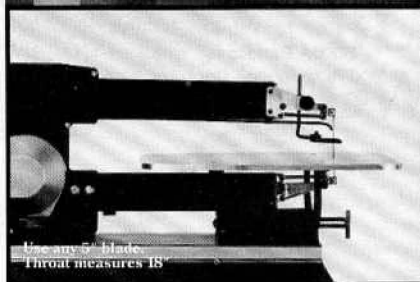
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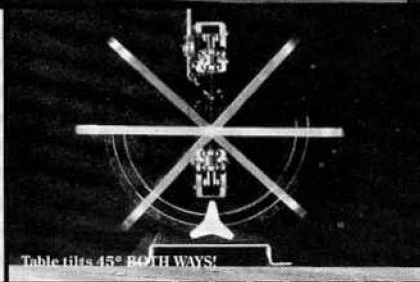
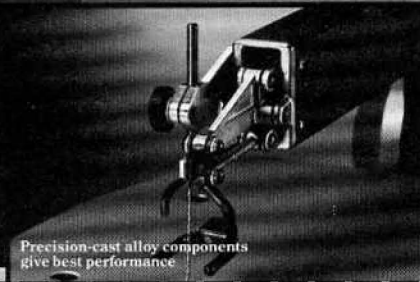


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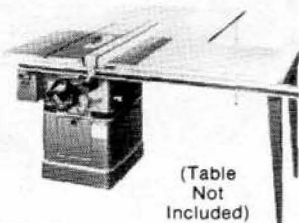
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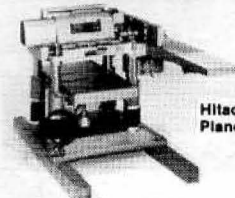


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# Letters

One of the Shop Tips on page 56 of your September/October 1984 issue tells us that small diameter brass rod can be hard to find. Your readers may be interested to learn that brass rod is available at welding supply stores. It's called "brazing rod" and is usually sold in a variety of diameters. Our local supplier carries 1/16, 3/32, 1/8, 5/32, 3/16, 1/4, 5/16, and 3/8 in. diameters in about 30 in. lengths. It is sold by the pound.

I hope this will help those readers looking for brass rod.

Dean Schuck, Charles City, Iowa

Can you tell me the name and address of a company that sells rebuilt woodworking equipment, including table saws and spindle shapers?

Gary Boughton

*The company Rudolf Bass, Inc., 45 Halladay St., Jersey City, NJ 07301 carries rebuilt machines. Write for more information.*

I am looking for a source of supply for thin hardwood plywood — 1/4 in. or less. Can you help?

Kenneth Cowan, Lancaster, Penn.

*Craftsman Wood Service Co., 1735 West Cortland Court, Addison, IL, sells 5/8 in. and 3/4 in. thick walnut and birch; 5/8 in., 3/16 in., and 1/4 in. thick basswood; and 1/4 in. thick red oak, white oak, and cherry. They don't sell the plywood in 4 ft. by 8 ft. sheets, but rather in smaller panels that measure 12 in. by 24 in., 24 in. by 24 in., 18 in. by 36 in., 24 in. by 48 in., or 35 in. by 35 in. Write for current prices.*

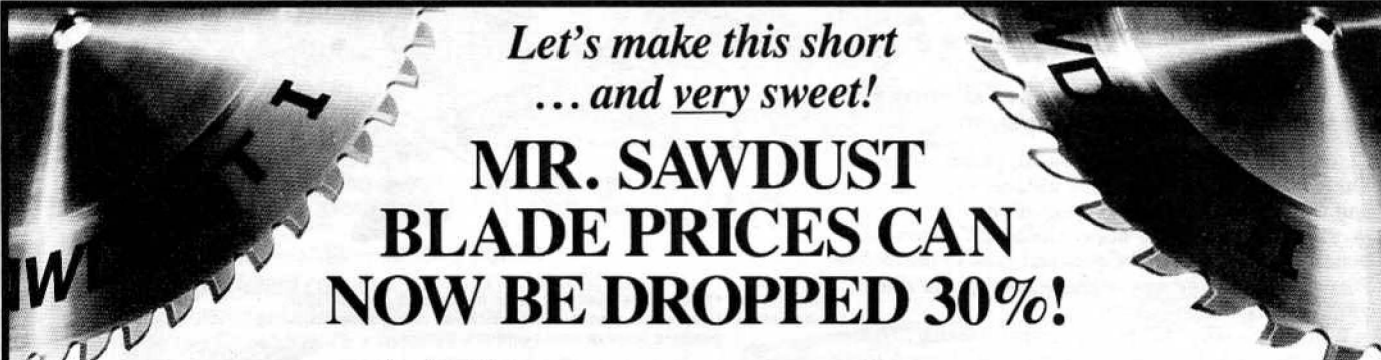
I've found a way to make notations on my woodworking plans without damaging them. When working on a project, I slip the plans in a clear plastic dust cover folder — the kind sold by just about any stationery store. Then, when I want to mark-up the plans, I use a washable marker pen and write on the plastic cover. When finished, the plastic can be wiped clean so that it's ready for the next project.

L. Frederick, Aspen, Colo.

When working on the veneer brackets featured in your January/February 1984 issue, I did not have a web clamp to clamp the veneer or in-laid banding around the form. To enable me to finish the project, I substituted an automobile radiator hose clamp, which is tightened by a screw as pressure is needed. I found this easier to use and less awkward than a web clamp. Hose clamps come in a variety of sizes and can be purchased at any auto parts or hardware store.

Also, while sanding the inlaid banding, I experienced problems with the lighter colored woods being smudged by the dust of the darker colored woods. In fact, the maple began to take on a gray color. I tried to progressively change grades of sandpaper, working up to 600 grit, but the gray still remained. The solution to this problem was to go over the discolored areas with a pink pearl or ruby red pencil eraser. There was no more dirty gray and the color of the banding

(continued on page 9)



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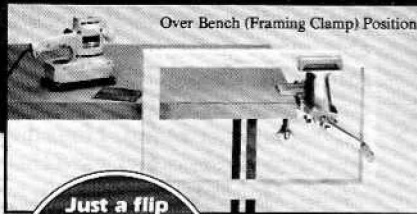
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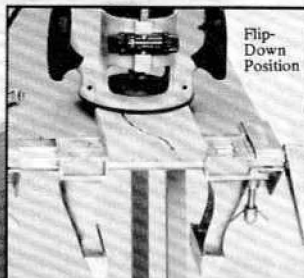
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## Letters, (Cont'd)

really came back to life again. However, it's important that the eraser be clean from smudges before using, or it will transfer to the banding.

Istvan Szonyi,  
San Louis Obispo, Calif.

I am looking for a source of supply for old-fashioned milk paint. Can you help?

Lowell E. Sheffield,  
Lincoln Park, Mich.

You can get milk paint from *Antique Color Supply, Inc.*, P.O. Box 711, Harvard, MA 01451

Concerning your article about constructing a workbench (September/October 1984 issue, page 16), I have one suggestion which may help to alleviate a problem. No floor, whether

wood or concrete, is level, so it's a good idea to install adjustable levelers on the bottom of each leg.

J.F. Koenen, Mt. Prospect, Ill.

### Woodworking Club Notes

I would like to announce the formation of The Tri-State Woodworkers' Club. The purpose of the club is to give woodworkers an opportunity to get together and talk about their hobby. Our club has been organized since last April and we have nineteen members.

Orville E. Smith  
2219 Carroll St.  
Ashland, KY 41101  
Tel. 606-324-2605

The Woodworker's Guild of Connecticut, 91 Tunxis Avenue, Bloomfield, CT 06002, meets the second Thursday of each month. If you'd like to join, write to them for more information.

The Woodworking Association of North America (WANA) has a woodworking show scheduled for January 11, 12, and 13 in Houston, Texas. It's called Woodworking World — The Houston Show and it will be held at the Shamrock Hilton Hotel. The admission fee will be \$5.00 and seminars are free with admission. For show and seminar information, contact: WANA, 35 Main Street, Plymouth, NH 03264. Telephone: (603) 536-3876.

The Albuquerque Woodworkers Association will be offering a pair of demonstration/lectures during the next few weeks. Wooden plane making will be discussed on November 10th, while on December 8th the subject will be traditional furniture woodcarving. The cost of each lecture is \$5.00 for club members, \$6.00 for non-members. For more information write to: Albuquerque Woodworkers Association, 615 Mission Ave. N.E., Albuquerque, NM 87107. Wwj

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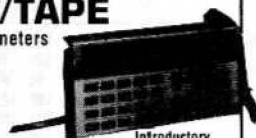
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**Series 300 Pro Duty** — 14 pc. Outfit — tungsten carbide piston and cylinder resists scoring by abrasive paints — 10.75 oz./min. **List 208 ★ SALE 129**

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Model	List	Sale of 12
#50 for 3/4" Black Pipe	11.23	7.40 80.00
#52 for 1/2" Black Pipe	8.38	6.10 67.50

#### JORGENSEN HAND SCREWS

Model	Jaw Length	Open Cap.	List	Sale	Box of 6
#50	4"	2"	11.50	7.25	39.15
#40	5"	2 1/2"	12.45	8.10	43.75
#30	6"	3"	13.35	8.50	45.95
#20	7"	3 1/2"	14.35	8.95	48.25
#10	8"	4 1/2"	15.97	9.95	53.75
#1	10"	6"	18.25	11.35	61.25
#2	12"	8 1/2"	20.94	13.50	72.95
#3	14"	10"	25.58	16.75	91.35
#4	16"	12"	34.55	23.75	128.25

#### JORGENSEN BAR CLAMPS

##### STYLE 37 — 2 1/2" Throat 1/4" x 3/4"

Model	Jaw Length	List	Sale	Lots of 6
#3706	6"	7.88	5.50	29.70
#3712	12"	8.73	5.95	32.13
#3718	18"	9.84	6.95	37.53
#3724	24"	10.54	7.35	38.80
#3730	30"	11.78	8.25	44.55
#3736	36"	12.85	8.95	48.33

##### STYLE 39 — 3 1/2" Throat 5/8" x 1"

#3906	6"	18.89	12.95	89.95
#3908	8"	19.45	13.50	72.95
#3912	12"	20.89	14.50	78.00
#3918	18"	22.55	15.95	85.50
#3924	24"	24.45	17.25	93.00
#3930	30"	26.18	18.35	98.00

##### STYLE 45 — 5" Throat 5/8" x 1 3/8"

#4506	6"	22.49	15.95	86.15
#4508	8"	23.04	16.50	89.10
#4512	12"	23.85	17.50	94.50
#4518	18"	25.18	18.95	102.35
#4524	24"	26.81	20.95	113.15
#4530	30"	28.08	21.95	118.50
#4536	36"	29.54	22.95	123.95

##### STYLE 72 — I-BAR CLAMPS

Model	List	Sale
#7224	24"	23.45 16.50
#7230	30"	24.30 17.50
#7236	36"	25.18 18.50
#7248	48"	27.82 21.50
#7260	60"	30.77 24.50
#7272	72"	33.28 26.50

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#### PORTER-CABLE List Sale

314	4 1/2" Trim Saw 4.5 amp	180	115
587	7 1/4" circ. saw 14.5 amp	199	130
315-1	7 1/4" circ. saw 13 amp	159	104
368-1	8 1/4" circ. saw 13 amp	169	119
9548	HD w/s bayonet saw w/case	255	179
648	H.D. single speed bayonet saw 3 amp	255	169
9627	2 sp. tiger saw kit 8 amp	183	120
336	3" x 21" belt sander	164	115
337	3" x 21" belt sander w/bag	174	115
361	3" x 24" belt sander	248	175
360	3" x 24" belt sander w/bag	269	180
363	4" x 24" belt sander	269	180
362	4" x 24" belt sander w/bag	284	190
505	H.D. 1/2 sheet finish/sander	155	105
330	spd bloc sander 1/4 sheet sz	85	56
304	Professional 7" disc sander	150	105
305	Professional 7" polisher	150	105
7511	38" xtra hvy w/s drill 5.2 amp	149	100
7554	1/2" xtra heavy drill 8 amp	195	135
309	3.8 amp laminate trimmer	115	90
310	3.8 amp laminate trimmer	180	130
312	offset base laminate trim.	195	135
319	tilt base laminate trimmer	205	140
167	block plane 2.5 amp	129	86
9652	Versa-Plane Kit	419	285
9118	Porta Plane Kit	289	195
518	NEW 3 hp speedtronic 5 spd microprocessor prod/router 10-13-16-19-22,000 rpm	475	325
520	NEW 3 hp production router	435	275
100	7/8 H.P. router	124	88
690	1 1/2 H.P. router	179	130
536	1 1/2 H.P. speedmatic router	295	210
537	1 1/2 H.P. D-Hdle router	310	218

#### DRYWALL SHOOTERS

7544	5.2 amp — 2500 r.p.m.	149	100
7545	5.2 amp — 0-2500 r.p.m.	149	100
7546	5.2 amp — 4000 r.p.m.	149	100

#### BLACK & DECKER List Sale

3050	6 1/2 worm/drv saw 12 amp	247	160
3051	7 1/4 worm/drv saw 13 amp	232	149
3052	8 1/4 worm/drv saw 13 amp	247	160
3030	7 1/4 circ saw 13 amp NEW	155	100
3047-09	7 1/4" super Sawcat circular saw	226	150
3048-09	8 1/4" super Sawcat circular saw	240	160
3157-10	v/sp orb. jig saw 4.5 amp	174	115
3153-10	v/sp speed jig saw 4.5 amp	158	105
3934	14" chop saw 13 amp 3800 rpm	279	169
4300	drill bit sharpener 1/8-1/2"	175	115
1321	1/2 rev spade hdlc drill 6 a.	175	115
4010	sander palm grip w/bag	80	49
4015	finish sander 1/2 sheet 10,000 orbits	160	110
2037	drywall 0-4000 rpm 4.5amp	139	89
2034	drywall 0-4000 rpm 3.5amp	121	69
1940	3/8 cordless drill kit 800rpm	157	100
1920	3/8" cordless drill kit 1850 r.p.m.	157	100

#### RECORD VICES

Model	Jaw Width	Jaw Open.	List	Sale
52D	7"	8"	69	49
52 1/2 D	9"	13"	93	65

#### MARPLES WOOD CHISELS

Walled Set of 5 (1/4" - 3/8" - 1/2" - 3/4" - 1")	
Model	List Sale
MR222/S5 Ash handle	22.70 15.95
M 444/S5 Polypropylene handle	33.50 21.95
M 373/S5 Splitproof handle	40.85 26.95
M 377/S5 Boxwood handle	51.40 33.95

#### "DOWL-IT" Dowel Jigs List Sale

1000	Self-centering	33.95 24.95
2000	Self-centering	42.95 32.95

#### ★ X-TRA SPECIAL ★ List Sale

7715	9" Dewalt Power Mitre Box	198.	125.
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#### ARROW STAPLERS List Sale

T-50	Staple Gun Tacker	21.60 14.95
HT-50A	Hammer Tacker	32.60 20.95
ET-50	Electro-Matic Gun	31.50 20.95
T-50	1/4" Staples-box of 5000	6.80 5.00
T-50	5/16" Staples-box of 5000	7.20 5.40
T-50	3/8" Staples-box of 5000	8.00 5.85
T-50	1/2" Staples-box of 5000	8.40 6.30
T-50	9/16" Staples-box of 5000	9.20 6.90

#### MILWAUKEE TOOLS List Sale

0224-1	3/8 drill 4.5A magnum	154	109
0234-1	1/2 drill 4.5A magnum	159	115
0244-1	1/2 drill 4.5A magnum	159	115
0222-1	3/8 drill 3.3A 0-100 rpm	139	99
0228-1	3/8 drill 3.3A 0-1000 rpm	129	95
0375-1	3/8 close quarter drill — NEW — 3.5 amp	168	118
0210-1	3/8 cordless drill — NEW — 2 speed	154	114
6539-1	cordless screwdriver — NEW — 190 RPM	84	64
1007-1	1/2" drill 4.5A D-Hdle	194	145
1107-1	1/2" drill 4.5A D-Hdle	199	145
3300-1	magnum rt angle drive kit	239	170
3102-1	Pimbrs rt angle drill kit	253	180
1676-1	HD Hole Hawg w/cse 2 sp	323	236
5395	3/8 sgle sp hammer drill kt	203	150
5397	3/8 var sp hammer drill kt	208	155
5371-1	HD mag. hammer drill 1/2"	207	151
5373	HD mag. hammer drill 3/8"	240	175
6507	TSC Sawzall w/case	184	125
6511	2 speed Sawzall w/case	172	123
6226	port band saw 2 sp w/case	382	280
6234	TSC band saw port w/case	382	280
6365	7 1/4" circ. saw 13 amp	159	109
6405	8 1/4" circ. saw 13 amp	179	127
6460	10 1/4" " 15 amp w/case	349	245
6377	7 1/4 HD worm saw 13 amp	235	155
6378	8 1/4 HD worm saw 13 amp	249	165
6165	12" Chop Saw 15 amp 4200 R.P.M.	267	189
6170	14" Chop Saw 15 amp 3600 R.P.M.	289	209
6255	v/sp Jig Saw 3.8 amp	199	140
6245	sgle sp Jig Saw 3.8 amp	175	125
6287	HD v/sp Jig Saw w/case 2.3	312	225
6012	1/2 sheet HD Orb. sander	149	110
6014	1/2 sheet HD Orb. sander	159	115
5935	4" by 24" belt sander w/bag 10 amp	299	215
5900	3" by 24" belt sander 9.5 amp	355	255
5660	1 1/2 HP router 10 amp	256	185
5680	2 HP router 12 amp	314	220
8950	Wet/Dry 8 gal vac 6 amp	336	110

#### BENCH GRINDERS

4901	1/4 HP 2.6 amp 24"	149	110
4921	1/2 HP 4 amp 26"	169	130
4891	1/2 HP 4 amp 41"	269	195
5041	3/4 HP 8.2 amp 58"	369	270

#### DRYWALL SHOOTERS

6753-1	3.5 amp 0-4000 rpm new	115	85
6747-1	4.5 amp 2500 rpm	144	100
6750-1	4.5 amp 0-4000 rpm	144	100
6751	4.5 amp 4000 rpm	144	100

#### FREUD SAW BLADES

Item No.	Description	Diem.	Teeth	List	Sale
PS203	Fin Cuttng	7 1/4"	24	27.24	17.50
PS203	fine cutting	7 1/4"	40	32.97	20.50

#### 5/8" Bore — Industrial Grade

Item No.	Description	Diem.	Teeth	List	Sale
LU72M010	Gen'l Purp.	10"	40	68.58	35
LU81M010	Gen'l Purp.	10"	40	69.30	36
LU73M010	Cut-Off	10"	80	79.65	39
LU82M010	Cut-Off	10"	80	86.40	45
LU84M010	Combination	10"	40	70.99	38
LU84M011	Combination	10"	50	74.51	40
LU85M010	Super Cut-Off	10"	80	110.88	68
LM72M010	Ripping	10"	24	64.85	37
DS 306	8" Dado			138.00	95
DS 308	8" Dado			170.00	115
TR 100	3 blades & Dado set			398.00	255

#### RECORD PLANES

Model	Type	Length	Width	List	Sale
03	Smooth	9 1/2"	1 1/2"	37	31
04	Smooth	9 1/2"	2"	38	32
04 1/2	Smooth	10 1/2"	2-3/8"	38	32
05	Jack	14"	2"	48	37
05					

# Readers' Information Exchange

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

I am in need of the manual and parts list for a Sears jointer, model no. 102.05600. I will pay for a copy, plus postage.

Gary W. Glaze  
P.O. Box 179  
Eddyville, KY 42038

Can any of your readers supply me with a manual for a Craftsman jig saw, model no. 103.23151? I am willing to pay any reasonable price.

Anthony A. Novak  
G3206 Stackweather  
Flint, MI 48506

I need a copy of the manual for a Belsaw 12 in. planer model no. 905.

Thomas R. Quinlan  
P.O. Box 130  
Haines, AK 99827

I recently purchased a 14 in. Sprunger band saw manufactured by Sprunger Bros. Inc., Ligonier, IN, model no. BSN P. I am in need of a manual.

Gary Peters  
2428 Wallace Lake rd.  
West Bend, WI 53095

I am in need of a manual and parts list for a Sears Craftsman band saw, model no. 103.24280.

Wilmer Oberholzer  
32 S. Locust St.  
Hagerstown, MD 21740

I would be grateful to any reader who might have a copy of the manual for a Sears table saw, model no. 113.22411. I will pay for copying and shipping costs.

C.R. Mason  
872 Holmdel Rd.  
Holmdel, NJ 07733

Can anyone tell me where to get transfers (decals) of flowers, birds, fretwork, etc. — the kind commonly used to decorate Oriental furniture? I used to be able to buy them from the company Pres-Solve Corp., 826 Suismon Street, Pittsburgh, PA, but they apparently have moved (or gone out of business) as even their forwarding address has expired. Perhaps another company can supply the same decals. Any help from your readers would be most appreciated.

Joseph L. Turner  
5520 Girard Ave.  
Philadelphia, PA 19131

Does any reader have an operating manual for a Sears 12 in. by 36 in. capacity wood/metal lathe, model no. 101.07403? I would pay for the cost of copies.

Les Naffziger  
603 West 12th St.  
Rock Falls, IL 61071

Can any readers supply me with copies of the owners manual and parts lists for two Sears jig saws — model numbers 103.0407 and 103.23151.

Keith F. Peters  
3353 Eden Way Place  
Carmel, IN 46032

I recently was given a Sears lathe (model no. 103.23071) for which I need an owner's manual and parts list. I will gladly pay for any reproduction costs.

William J. Balmelli  
8 Poplar Street  
Milford, MA 01757

I have a 10 in. Delta band saw, model no. TBS 10. In particular, I need to know the correct blade length, but would also like to obtain an owner's manual.

J.E. Wheeler  
215 Estevan Drive  
Bismark, ND 58501

I recently obtained an unassembled Rollin All-Purpose band saw, manufactured by the Rollin Saw Company of Parma, Michigan. Can any of your readers supply me with a manual or information?

R.P. MacFadyen  
Cornwall P.O. R.R. #2  
Prince Edward Island  
Canada C0A 1H0



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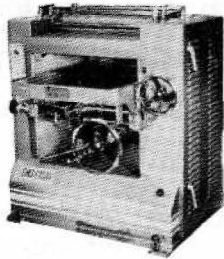
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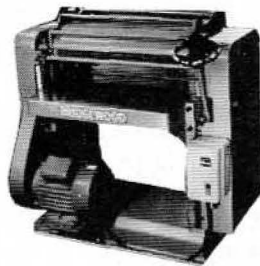
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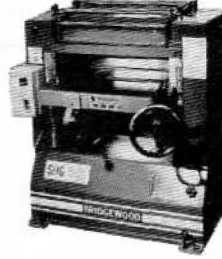
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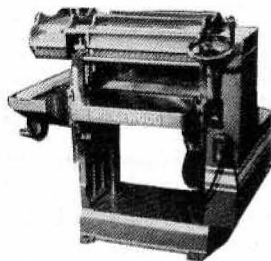
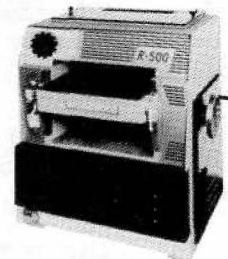
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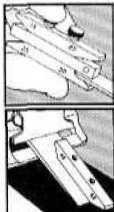
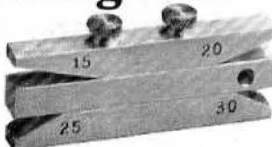
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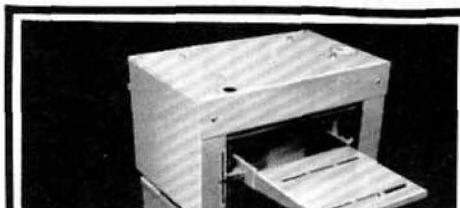
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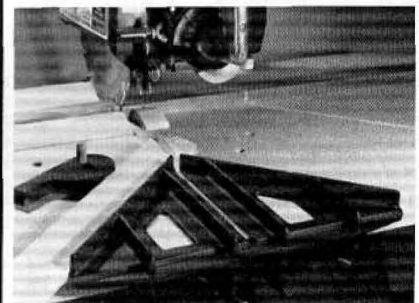
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# Workshop Income

## Starting a Business: Part II

In this, the second feature of our two-part Workshop Income column looking into the subject of starting up a woodworking business, we examine what tools to equip a shop with, where to locate the shop, and how to finance the shop. We expect that the information on tools will be of interest to all woodworkers, whether or not they have plans to start a business.

There is probably no more discussed subject among woodworkers than their tools. Most adhere to the old adage "you know a workman by his tools," and consequently take considerable pride in the tools they use. Not surprisingly, however, our survey revealed many differing opinions. If there were an area of at least general agreement, it was in what specific tools you will need.

In addition to a 10 in. table saw, our respondents recommended an 8 in. jointer, a 12 in. band saw, a drill press, a 12 in. lathe, a combination belt-disc sander, a 12 in. thickness planer, and a router table, along with the usual assortment of small power and hand tools. A saber saw, a 3 in. x 24 in. belt sander, a dual-action pad sander, and 1/2 in. and 3/8 in. drills were those small power tools that everyone agreed were a must. The woodworkers we surveyed also mentioned somewhat more specialized tools, that may or may not be necessary, depending on the items you will make in the shop. A shaper, a mortising machine, a horizontal boring machine, a radial-arm saw, a scroll or jig saw, and a power hand planer were the tools most often listed.

Although woodworkers in general agreed on *what* tools to purchase, there was no such harmony when it came to listing specific brands. Brand loyalty was high, with many of the most highly recommended small power tools being foreign-made, especially Japanese. For the larger shop tools, however, the traditional name-brand manufacturers remained dominant. Not surprisingly, nearly all woodworkers made a point of avoiding the low-priced so-called hobby tools typically offered at department and hardware stores.

Considering all the individual opinions together, we have compiled a list of those tools most woodworkers envision as the best choice for an "ideal" shop. By and large, the tools mentioned were neither the "top-of-the-line," most expensive tools available, nor were they the "bargain" variety. They were chosen as those tools best representing a balanced combination of both quality *and* value.

10 in. Table Saw	Powermatic, Delta	Unisaw
8 in. Jointer		Delta, Inca
Thickness Planer	Hitachi, Makita, Delta	
Band Saw		Hitachi, Delta
Lathe		General, Delta
Drill Press		Delta
Shaper		Invincible
Belt Sander	Porter-Cable, Sears, Black & Decker	
Stationary Disc-Belt Sander		Delta
Router		Hitachi, Makita
Drills		Hitachi, Makita
Saber Saw		Bosch
Jig Saw		Delta
Orbital Sander	Makita, Hitachi, Porter-Cable	
<i>Delta is formerly the Rockwell Power Tool Division</i>		

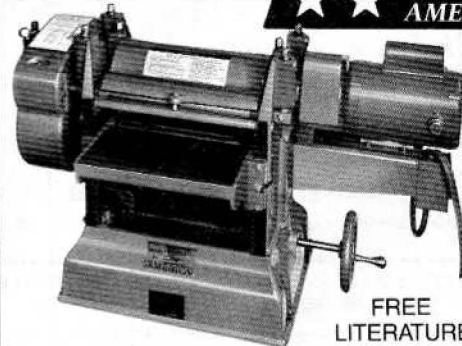
(continued on page 15)

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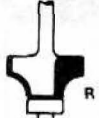

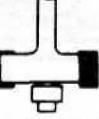

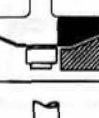



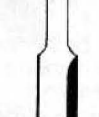
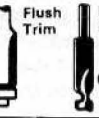
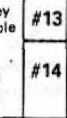
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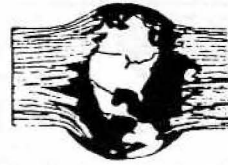
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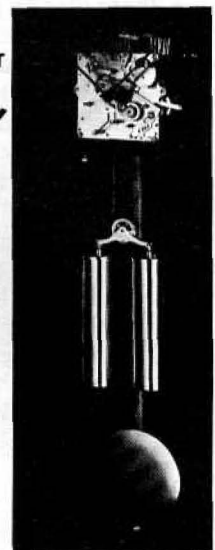
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## Workshop Income, (Cont'd)

Although nearly all the woodworkers we surveyed had moved on to commercial duty equipment, almost everyone started out with Sears tools. Indeed, many woodworkers reported that one or two of their original Sears tools had performed so well over the years that they were still in daily use. No one hesitated to recommend equipping a shop entirely with Sears when starting out, especially if price is a major consideration. Most woodworkers pointed out, however, that Sears tools are designed primarily for use by weekend or hobby woodworkers, and not for use in production shop situations.

An alternative to the purchase of new tools is the purchase of used equipment. The fact that so many of our readers have written in to us requesting information on operating manuals for older tools is an indication of the interest in them. As a rule, when they are well treated, woodworking tools can last indefinitely. If the tool is structurally sound, new bearings, cutters, and, if necessary, a motor are all that are required to make an old tool perform like new. Although much of this older equipment was cast heavier than contemporary tools, when properly reconditioned there should be no sacrifice in either speed or accuracy. In fact, for the price of new, medium-duty tools you may be able to set up your shop with reconditioned production-duty equipment.

Unless you have an unlimited supply of orders, location can be one of the keys to success. Contrary to the popular conception of the lone woodworker isolated deep in the woods, the contemporary woodworker may have to depend on his shop for exposure. Many of those surveyed indicated that they had succeeded by locating their shop in an urban setting where passers-by could actually look into the shop and see how things are made. In spite of the obvious disadvantage of such interruptions, woodworkers said that the exposure generated considerable interest, and therefore sales. In the words of one woodworker, "It matters not how good you may be; until people discover you, you will labor in obscurity."

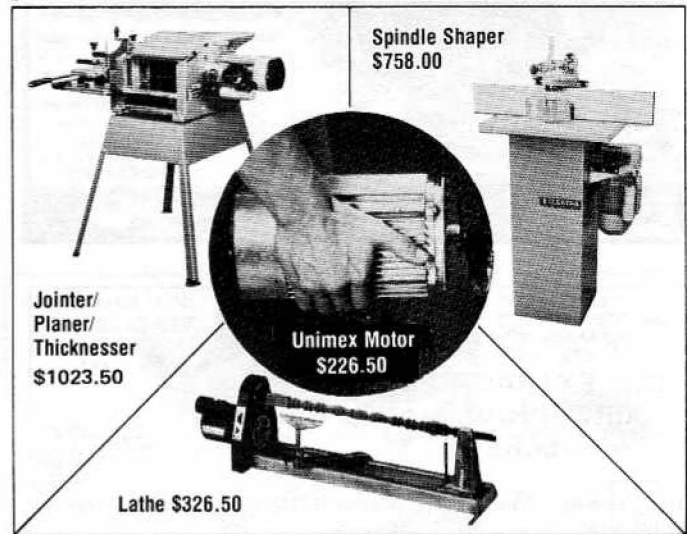
On the question of wholesale or retail, most of the full time production woodworkers admitted that the bulk of their sales was wholesale, not retail. Very simply, full time woodworkers said that they did not have the time to both make and market their own work. Most of those woodworkers selling at the retail level either owned their own store-workshops, or were part time, hobbyist woodworkers.

The woodworkers we surveyed were divided in their attitudes toward financing a business. Some borrowed from conventional sources — banks and lending institutions, while others counseled conservatism — "start small and add new machinery as you grow." By and large, though, the consensus of opinion was that if you believe in yourself and have a product that will sell, do it right. If necessary, borrow enough money to both buy the right equipment and locate in a shop with adequate space. Other viable alternatives mentioned were taking in a partner, and borrowing from family.

On the subject of what to make, most woodworkers reported that they made either furniture or specialty items. Many of the woodworkers acknowledged, however, that the real "money" is in architectural woodworking, primarily kitchen cabinets. Summing up the thoughts of our respondents, one particularly astute woodworker counseled, "To succeed in this business, you make what people need." Ww

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# Restoring Antiques

## Preparing For The Final Finish

by John W. Olson

I'm sure that all woodcrafters, at one time or another, have been disappointed with a final finish that they applied to a painstakingly restored piece. It can be discouraging, to say the least, especially when you've spent hours stripping an old finish, regluing loose joints, and patching unsightly gouges. All that work goes down the drain when the final finish is a poor one.

In order to get an attractive final finish, the wood must be properly prepared before the finish is applied — a fact that many woodcrafters overlook. Surface preparation is very important, so be sure to sand the piece thoroughly.

To sand properly, the wood surface must be smoothed in steps, with each step using progressively finer grits of sandpaper. Most planed surfaces are fairly smooth, so the sanding process can usually begin with 100 grit aluminum oxide paper. Once the surface has been sanded with the 100 grit, you can progress through the finer grits: 120, 150, 180, etc.

With soft woods, such as pine, final sanding can be with a 180 or 220 grit paper. Of course, finer grits can be used, but it is a wasted effort to work beyond the limits of the material at hand. Just about all wood species are too soft to be smoothed to the same degree as metal or plastic. However, some hardwoods can be smoothed to 300 or finer grit.

It is most important that you remove any scratches left by sanding with the previous grit. Any scratch that remains will become immediately apparent when the first coat of clear finish is applied. There is no easy way to correct such a problem, except to remove the finish and start all over with sandpaper.

Check repeatedly to make sure all surface defects have been corrected. Examine the surface in reflected light from several angles. Stand on the side opposite the light source. Rotate the piece so that the light will hit it from different sides and different angles. At the same time, run the tips of your fingers over the surface. The marvelously sensitive instruments will often detect small imperfections that you missed before. Don't make preparations to apply the final coat until you are satisfied that the surface is as near perfect as you can make it.

I prefer to apply final finishes with a spray gun, however, a perfectly satisfactory job can be done without one if the woodcrafter uses a lot of concentration, patience and has a good brush. If you plan to use a brush, make sure that it is a really good one. The hallmark of the first class brush is long, soft, split bristles. Good brushes will have bristles that are one third to one half longer than the width of the brush. This rule does not apply to extremes. A very wide brush may have comparatively shorter bristles but should be long enough to be soft and very flexible. Narrow brushes should also have long, soft flexible bristles, but not so long as to become floppy when wet. The bristles themselves

should each taper to an almost invisible point. When they are examined closely, it can be seen that each individual bristle is split into two or more ends.

Natural hog bristles that, at one time, were considered the best bristles, are naturally fibrous. Modern technology has made possible fibrillated nylon and other synthetic bristles that are so close in appearance and performance to natural hog bristles that it can be difficult to tell them apart in a good brush. Nylon makes a perfectly acceptable brush for most finishes, however, some of the new two-part finishes contain powerful solvents that are capable of turning nylon (and many other plastic brushes) into an unrecognizable glob of wet plastic. If you use one of these finishes, be sure to read the label and carefully follow the manufacturer's instructions.

Good bristles are not only fibrous, but each bristle also tapers to a point and is long, flexible, and soft. When buying a brush, grasp it at the ferrule and run your fingers downward off the ferrule into the bristles and to the end of the brush. The bristles should feel fairly thick just below the ferrule. A good brush also tapers from the ferrule to the end. The lower part of the brush, called the chisel, is formed by shortening the outside bristles progressively and equally on both sides to form the chisel. A good brush is expensive but it behooves you to buy the best you can possibly afford.

A good brush will last many years if properly cared for, and an important part of proper care is the manner in which you use the brush. Never dip your brush more than halfway into the finish. Try not to have excess material in the brush when working on vertical surfaces. The whole point of these two precautions is to keep the heel of the brush as clean as possible. This pays off by making the brush easier to clean and by preventing contamination of new finishes with old. The solvents in the new finish may be capable of taking dried material in the heel into solution and changing the characteristic of the new material.

Brushes are easy to clean if done before the finish begins to set up. Read the manufacturer's label and follow the instructions for cleaning. Generally speaking, hydrocarbon based finishing materials can be cleaned out of brushes with gasoline, paint thinner, kerosene, or commercial brush cleaners. Rinse the brush at least three or four times, or until the last rinse shows no sign of the finish and the brush feels clean and soft. It is good practice to wash the brush in hot soapy water and rinse well before hanging up to dry. Never leave a brush in a can of solvent or finish with the bristles resting on bottom for any length of time. The bristles will bend and take a set which will make the brush less useful in the future. Brushes used for applying lacquer should be cleaned in lacquer thinner. Those used to apply shellac should be rinsed in alcohol and then washed in a strong solution of ammonia in hot water. Lacquer brushes should also be given a final cleaning in hot soapy water.

After the brushes are dry and ready for storage, the bristles (from the ferrule down) should be wrapped in heavy grocery bag type paper. Store in an area that's free of dust and dirt. A drawer or a cabinet would be ideal. Lay the brush flat or hang it by the handle. Most paint brushes have a hole in the handle for hanging and if yours doesn't you can drill one. Between coats, the brush can be hung in a covered can of solvent so that the bristles do not touch bottom. You can also put the brush in a plastic bag and lay it flat on a horizontal surface.

Next issue, I'll talk about the proper way to apply finish with a brush and then get into using the spray gun. WwJ

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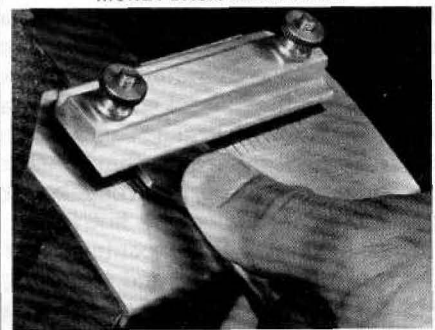
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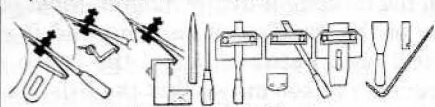
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# The Beginning Woodworker

## The Fundamentals of Wood

by Roger Schroeder

In an age of particle board furniture and simulated wood grain formica, it is no wonder that many of us lose sight of the fact that furniture was once made from solid boards of real wood. After the lumber had been cut and milled, the typical cabinetmaker of the past carefully selected his stock and began the real work of planing and joining. Today, traditional values are being revived, as many of us rediscover the value and beauty in real wood.

### The Living Tree

Trees are usually classified as either hardwoods or softwoods. The hardwoods have leaves that die in the fall and the softwoods have needles that are constantly replenished, leaving the tree green throughout the year. The hardwood/softwood distinction is not always accurate, however, since yellow pine can be extremely hard, while soft modelmaker's balsa wood is technically classified as a hardwood.

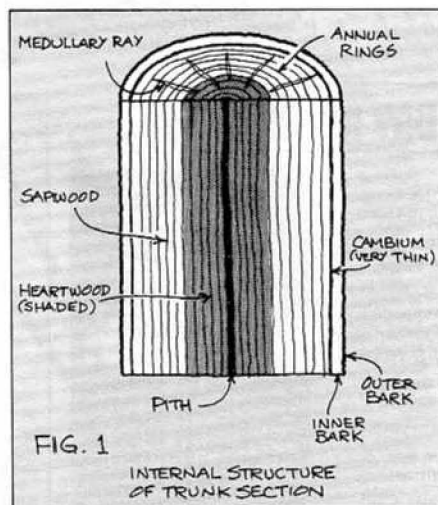
Perhaps the best distinction is that most softwoods feature exposed seed pods and are usually characterized by a single, straight trunk. Softwoods include conifers such as pines, spruces, hemlocks, and cedars. Hardwoods are characterized by seeds that grow in fruits or shells with trunks that often branch and then re-branch. Hardwoods include oaks, fruitwoods, maples, birches, dogwoods, poplars, willows and numerous others.

These are examples of the trees that most of us are familiar with. However, many people, myself included at times, fail to make the connection between a fine piece of furniture and the forest tree from which it originally came.

If you were to take a section of tree, slice off the top so its rings are clearly visible, then cut the tree down its middle, you would have a clear picture of the tree's internal structure (see fig. 1). In the very center is the pith, a soft material that often appears as a dark tube. Around the pith is a dead area called the heartwood.

To understand how heartwood forms we must examine the way in which trees live and grow. The tree, like oth-

er living organisms, has a circulatory system that brings water and nutrients, called sap, from the roots to the leaves. This system is called sapwood, which is the lighter part of the tree section compared to the darker heartwood. As layers of sapwood gradually die, they become the heartwood. Useless to the tree? Hardly, for heartwood provides the vital support to trees that sometimes grow hundreds of feet. When this core rots away, the tree is left with a virtually hollow interior, and little resistance therefore to storms and winds.



Moving outward, the area next to the sapwood is called the cambium layer, a section which produces both new wood and bark. After the cambium is the inner bark, a narrow layer that transports food from the leaves to the cambium. The last, or outer layer, is the bark, consisting mostly of dead cells. The bark insulates and protects inner tissues from disease and drying. It should not be forgotten that American Indians well understood the virtues of this waterproofing characteristic of bark and utilized bark from certain trees to make their canoes.

Looking at a cross section of tree, you will see the rings which represent the yearly growth. These are sometimes compared to wooden cones placed one over another. Interestingly, the rings also reflect climatic and growing conditions. Wood samples with as many as seventy rings per inch, for instance, indicate slow growth. This is sometimes the result of

a combination of bad soil, little sun and inadequate rainfall. Woods with only two or three rings per inch might be characteristic of a tree growing in an open pasture, with good soil and plenty of moisture.

Also visible in many woods, are vessels or open-ended cells. Looking at the end grain of the tree or a board, these appear as pores. In some woods, especially oak, they are highly visible.

Often noticeable on an end section of wood are medullary rays. These store food and act as a conduit for water in a radial or outward direction. These rays may have a pronounced effect on the appearance of the wood, depending on how the wood is cut. They are most prominent on quartersawn oak. A great many pieces of oak furniture, highlighting these rays, were made at the end of the last century and the beginning of the 20th. Gustav Stickley, whose chair we feature in this issue, was one of those early 20th Century craftsmen who preferred quartersawn oak for some of his work.

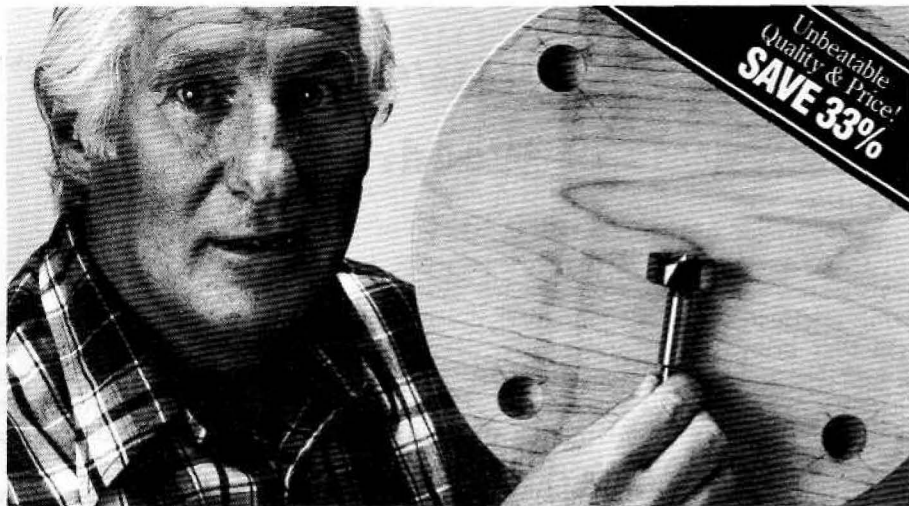
### Water Removal

After the wood has been milled into boards, it must be dried so that the majority of its moisture is removed. Removing moisture from the wood acts to stabilize it so that it may be worked.

The expression commonly used when talking about water in wood is moisture content or MC. This is measured as the percentage of the water weight in a given piece of wood in relation to the weight of the wood when completely dry, or 0% MC. The MC of some woods may be as much as 200%, while others might only be 20%. An 8 foot length of hemlock 2 x 4 may hold four quarts of water. The cabinet lumber you usually buy, be it a length of pine or oak, should have a MC of about 6% to 8%.

Traditionally, lumber was air-dried. This meant stacking the lumber outside with wood strips (called stickers) in between to allow the air to circulate. The pile was then covered with a canopy or shed roof to protect the top

(continued on next page)



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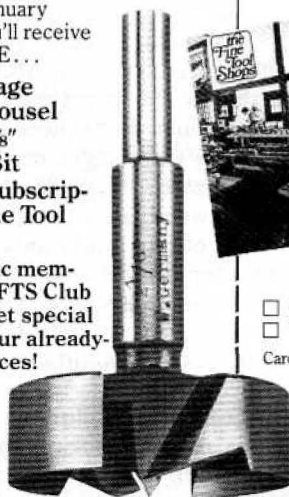
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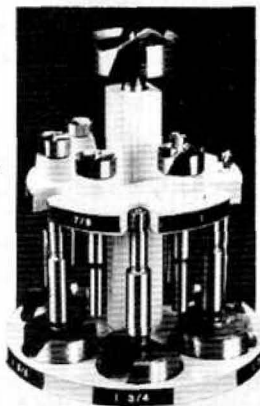
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### Beginning Woodworker (cont'd)

boards from repeated wetting. This method was known as "Ricking." Ends were coated with a paint or other non-porous material to prevent the ends from drying faster, a condition that created splits, commonly called checks. Air-drying may require anywhere from 15 to 200 days of warm, not too humid weather in order to reach a 15% MC for 1 inch thick material, such as pine. Later, wood must still be dried for a time indoors before the lumber can actually be used for cabinetwork. This whole process may take a year or more.

Today, most lumber is kiln-dried. This is a thermostatically controlled process of water removal in specially constructed kilns. Temperatures range anywhere from 110 to 210 degrees Fahrenheit. The advantage of the commercial kiln is that wood can be dried in a very short time.

Many a woodworker is tempted to take a local tree, most likely walnut, have it brought home, cut into boards, and stacked outside, with the intention that it will be made into fine pieces of furniture. If he can get the tree's sections moved and if he can find a sawmill that will accommodate the logs, air-drying is still a process that takes knowledge, care, and patience. A useful government booklet on the subject is *Air Drying of Lumber: A Guide to Industry Practices*, U.S.D.A. Agricultural Handbook no. 402, U.S. Government Printing Office, Washington, D.C. 20402.

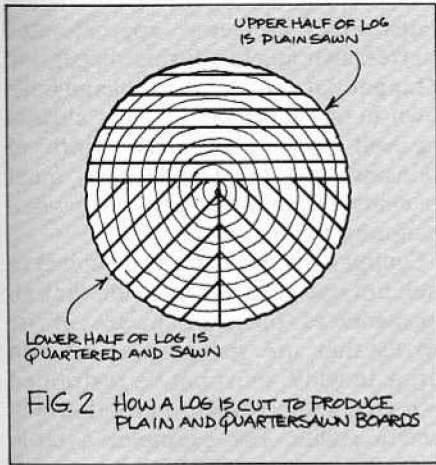
### Cutting the Lumber

Rarely is a tree section dried in its entirety. It would probably not dry evenly, whether air or kiln-dried, and the process would take too long, especially with air-drying. The rule for air-drying is: one year for every inch of thickness. Because of these problems, then, logs must be sawn into boards before the wood is actually dried.

The typical commercially available board is either plainsawn or flatsawn. With this method, four slabs are first cut from a log to remove most of the bark and some perimeter sapwood. The squared log is then sliced into boards. With plain or flatsawn boards, when looking at the end grain, you will note that the curvature of the annual growth rings often runs roughly parallel to the surface (see Fig. 2).

Another type of board cut is known as quartersawn. It is called this because the log is sawn into quarters and the boards are then cut so that the rings are nearly perpendicular to the

board surface. This method is not as economical as plainsawing, since it results in more waste. As mentioned earlier, however, with some species of wood, especially oak, the pronounced medullary rays that quartersawing brings out, make for unusually attrac-



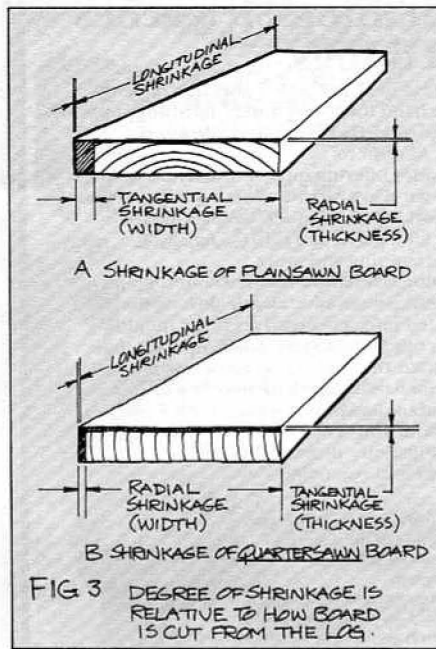
tive figuring on the board surface. If there is an advantage to quartersawing lumber, it is that there is less shrinkage across the face of the board and therefore less of a tendency toward cupping.

### Wood Shrinkage and Warping

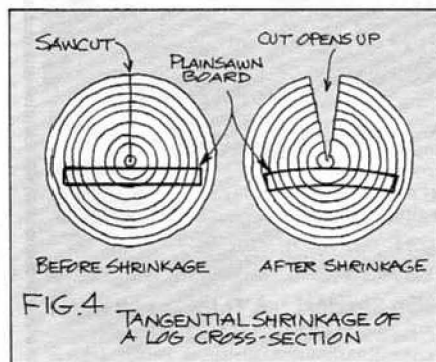
Though wood has its advantages over steel and other materials such as plastics, it is not nearly as stable in terms of dimension. Immediately after a tree is cut, the wood will begin to lose moisture into the atmosphere. Consequently, the wood shrinks. Conversely, even kiln-dried boards will expand slightly when they are subjected to an atmosphere of increased humidity. This is why in summer, when there is higher humidity, drawers stick and doors won't open. In winter, especially in homes using hot air or wood heat, boards can shrink and occasionally even crack. Chairs may get wobbly, panels may rattle in their frames, and pegs may loosen in their holes. There are three basic types of shrinkage, *radial*, *tangential* and *longitudinal*.

Radial shrinkage reduces the thickness of the annual rings. With plainsawn lumber radial shrinkage will affect the board thickness, as seen in Fig. 3A. With quartersawn wood radial shrinkage affects the width of the board (3B).

How great can radial shrinkage be? For a freshly cut piece of white oak, if it is dried to 0% MC, the percentage of shrinkage will be about 4½%. For a piece of white pine, shrinkage will be about one half of that, or 2%.



The type of shrinkage that a woodworker must be most aware of, however, is tangential shrinkage. This affects the length of the circumference of the rings. The classic illustration of this is a thin disc cut as a cross section of a log. A saw cut is then made from the outside to the center of the disc, and the disc is left standing upright in the sun to dry. As the moisture begins to evaporate into the atmosphere, the saw cut begins to open up (Fig. 4).



Tangential shrinkage also answers a question asked by many woodworkers: Why do boards cup opposite to the curvature of the rings? Tangential shrinkage is the most common problem with plainsawn lumber. It is of particular concern to woodworkers because it affects board width to a significant degree.

How great is tangential shrinkage? For the same woods, oak and pine, reduced to zero MC, the percentages are 8.8% and 6.1% respectively.

The third type of shrinkage is longitudinal, or along the length of the board. The percentage of longitudinal shrinkage is usually between .1% and

(continued on next page)

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.2%. When boards of less than 10 feet are used, this type of shrinkage can be considered as negligible.

From a practical point of view, most of us work with lumber that is mainly plainsawn but, depending on where from the log the board is cut, some plainsawn lumber approximates quartersawn stock. All this discussion of tangential and radial shrinkage boils down to one main point: most shrinkage will occur across the width of plainsawn stock and allowances must be made for this "movement" when designing a piece.

Coping with shrinkage is a subject in itself but one hard and fast rule that all woodworkers must be aware of is: boards that are going to swell and shrink in width must not be restrained with glue and screws to parts that will remain stable. For example: a table top can be fastened to a base with screws through slotted holes in the base. This is one of several good methods which will allow the top to expand and contract in width.

Other characteristics and qualities of wood, particularly the grain direction, also directly affect the design of a piece including the manner of construction and the joinery used. The end grain of any board is porous and cannot be permanently glued to any other wood surface. To join a horizontal member to a vertical member (end grain to long grain respectively), a joint such as a mortise and tenon or mechanical fasteners must be used.

Glue by itself can only be used when joining long grain to long grain. Examples of long grain glue joints include face to face and edge to edge joints. The most effective and widely used joints in woodworking are designed to maximize glue surface where long grain contacts long grain.

When edge-gluing boards for tabletops or other wide surfaces, some craftsmen suggest arranging each board so the growth rings, as seen at the ends alternate up and down. Others contend that it's best to face all boards so that the heartwood faces up, while still others recommend aligning heartwood edges to heartwood edges. Naturally, much will depend on the character of the wood used as well as the design of the piece. When in doubt, your best bet is to simply arrange the boards with the most attractive grain figures face up, regardless of grain direction, but remember to reverse direction as necessary when planing to prevent tearing the wood.

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# Cabinetmakers' Supplies

## Hardware 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 specialize in mail order sales of furniture hardware. While we don't have the room to mention all the products each company carries, we have tried to list at least some of them.

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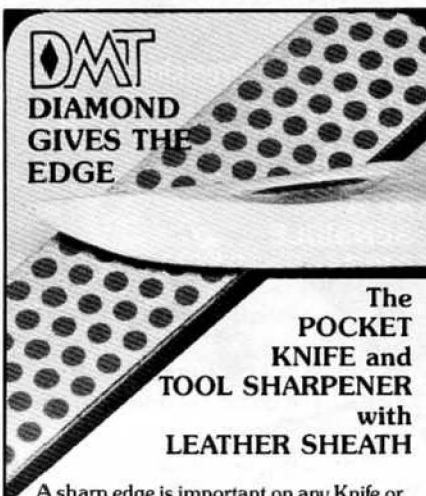
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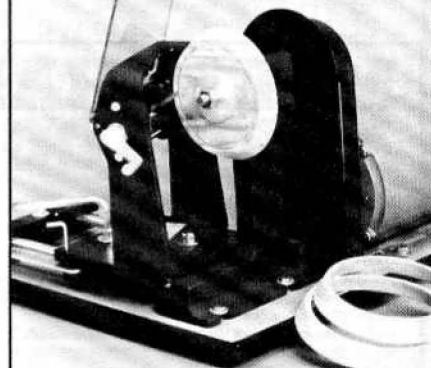
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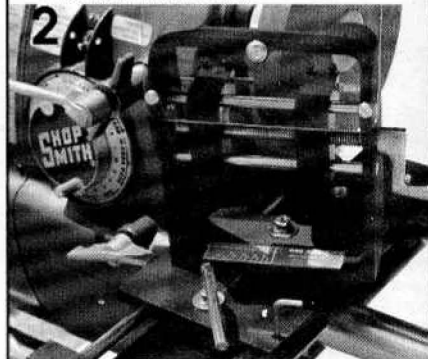
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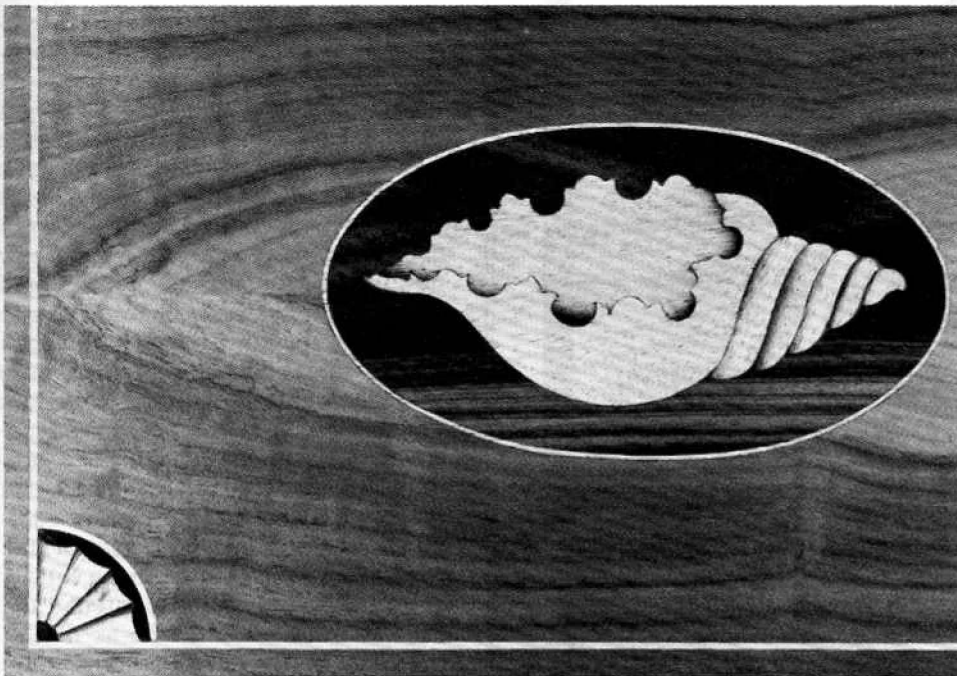
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# Special Techniques

## Inlays and Inserts



When archaeologists opened the tomb of Tutankhamen, in addition to the mummy and sarcophagus, they discovered a wealth of furniture, much of it featuring delicate inlay work. In the times of the ancient Egyptians, veneer inlays were laboriously cut by pit-sawing, a practice that continued well into the middle ages.

Inlaying is one of the oldest methods of decorating and highlighting furniture and small wooden objects. Although with modern tools the art of inlay is somewhat less labor intensive than it was during ancient times, the skills and artistry required are certainly no less demanding. Nevertheless, inlaying is a skill that appears to be far more complicated than it actually is.

At this point it is important to distinguish between inlay work and marquetry. Although some marquetry is inlaid, for the purposes of this feature we shall consider only decorative inlays and small pictorial inserts (rosette, clamshell, etc.) The great complexity and highly technical character of true pictorial marquetry mandate it as a subject that must be examined independently, in a future Special Techniques column.

Inlaid banding and inserts are used in a number of ways — some practical, but most decorative. Historically, dec-

orative inlays were largely a form of artistic expression by the cabinet-maker; an embellishment used to distinguish or dress-up a particular piece. In a more practical vein, inlays of contrasting color were used along a border or parallel to an edge to accentuate or define the line and form of a piece.

Commercially produced inlaid banding and decorative inserts are available in many different patterns. Some of the more common applications of inlaying are to form borders on cabinet doors, drawer fronts and tabletops, to highlight straight-tapered legs, and to decorate serving trays and jewelry boxes.

Basically, an inlay is a strip or section of contrasting wood that is "let-in" or "inlaid" into a larger section of base wood, commonly called the primary wood or "ground." Most experts agree that the three best primary woods for inlaying are mahogany, walnut and cherry. The relatively uniform grain pattern and dark color of mahogany and walnut make them ideal grounds for the inlaying of lighter colored woods.

There are three methods of inlaying: using the router, the scratch stock, and by hand. The special technique of inlaying is not so much a single special technique as it is a combination of

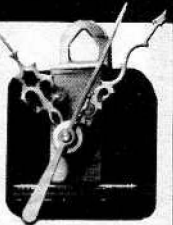
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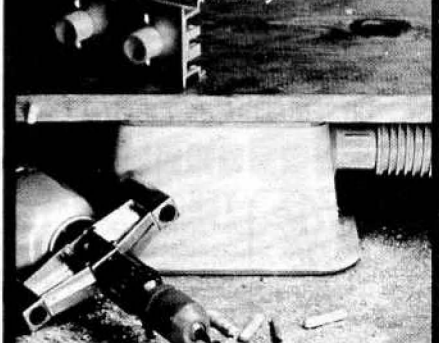
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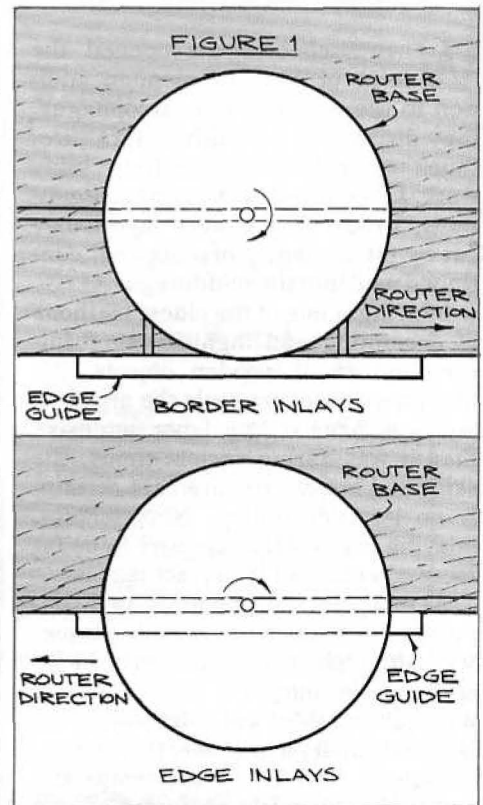
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## Special Techniques, (Cont'd)

many separate skills that when mastered will together result in a professional looking inlay job.

### THE ROUTER

The router can either be used free-hand, or with a fence or guide bushing. The simplest way to cut straight grooves for inlays is to use a straight bit equal to the inlay's width, and then set the router depth so that it will cut a recess slightly less than the thickness of the inlay. For clean, precise router cuts, hold the router fence squarely and firmly against the workpiece and guide the router with a constant steady forward motion, never pausing. When cutting border inlays, it is important to move the router around the workpiece in a counterclockwise direction, *opposite* to the rotation of the bit. The pulling action of the bit as it cuts through the wood will help insure that the router's fence is kept tight against the workpiece. When cutting edge inlays, move the router clockwise, around the work in the *same* direction as the bit (Fig. 1). Keep in mind that depending



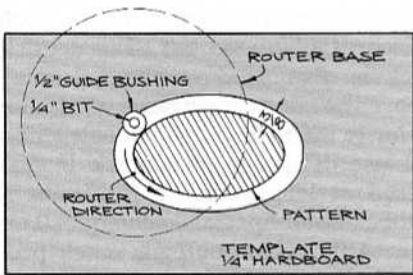
on the grain character of the ground, it may be necessary to disregard these general guidelines and work solely with respect to grain direction.

The router may also be used to cut the recesses for decorative (sometimes called artistic or marquetry) inserts.

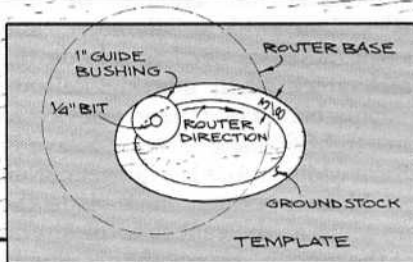
The easiest way to recess for an insert is to first trace the outline of the insert on the "ground," and then rout free-hand to within about 1/16 in. of the line. Use the appropriate carving gouge (#3 gouges are ideal) and/or X-acto® knives to trim the remaining wood away.

Routing for inserts may also be accomplished using templates and guide bushings. This procedure involves three basic steps. First, make an exact pattern of the insert on a piece of 1/4 in. plywood or hardboard. Fix this pattern to a second section of 1/4 in. template stock with wire brads. Now, using a 1/4 in. straight bit and a 1/2 in. guide bushing, cut out the actual template.

Next, locate the template on the "ground," exactly where you want the insert, and clamp the template in place. (It is a good idea to make the template from a large section of template stock to allow room for clamping.) Change to a 1 in. guide bushing and cut the outline of the insert. Finally, clean out the remaining waste (see Fig. 2).



CUTTING THE TEMPLATE



ROUTING THE RECESS  
FIGURE 2

By using this same template guide in conjunction with the 1/4 in. straight bit and 1/2 in. guide bushing you may cut your own veneer inserts. As an aid in positioning inserts, most experts suggest drawing centerlines across both the veneer and the ground, and marking one edge with an "x".

### SCRATCH STOCK

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(continued on next page)

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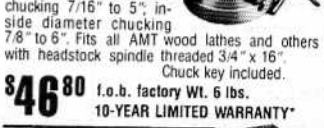


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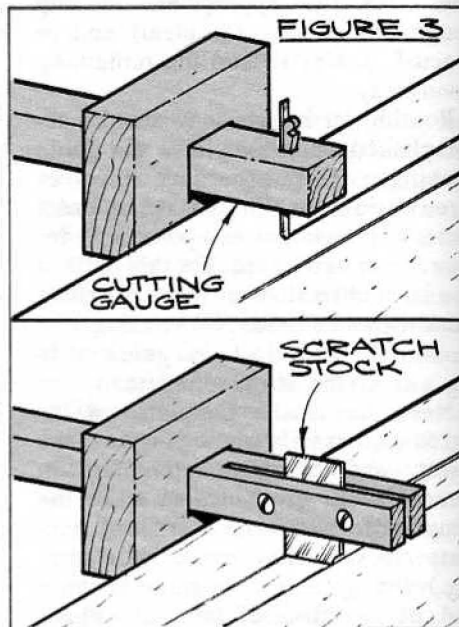
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## Special Techniques, (Cont'd)

complished using a scratch stock, and/or a cutting gauge (Fig. 3). The



cutting gauge would be used to score the two sides of the groove, while a scratch stock, with the blade equal to the desired groove width, is then used to clean the groove out. The scratch stock is also used to channel inlay grooves on concave surfaces where the router is ineffective. The construction and use of the scratch stock is discussed at length in the September/October issue Special Techniques column. Although a router is much preferred to the scratch stock, as a rule router bits are not available in sizes smaller than 1/16 in. diameter, and you will therefore need to rely on the scratch stock when inlaying delicate pin-stripe borders. A handy device to assure tight-fitting pin-stripe inlays of uniform width is to inlay the veneer on edge. Make a scratch stock blade the same width as the veneer is thick, and after the grooves are cut simply glue in strips of the veneer on edge. The veneer inlays are later sanded flush with the ground surface.

### HAND INLAYING

In modern times, hand inlaying is limited largely to either decorative or artistic inlays. Even when insert recesses are cut freehand with the router, the edges must still be cleaned out with hand tools. Elaborate free-style inlays naturally require extensive handwork. The key to hand inlaying is patience, sharp tools, and steady hands. The best fitting inlays are slightly undercut or beveled, so that

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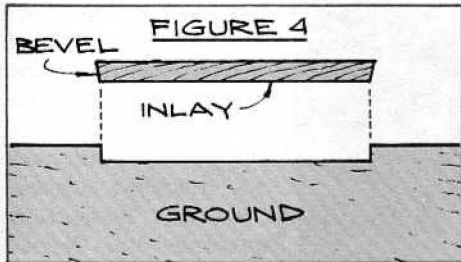
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when they are fitted into the recess the edges will create the tightest possible union.

After the inlay edge has had the bevel applied, the outline for the recess is then taken from the narrowest point of the bevel (Fig. 4). When the



inlay is actually applied, this slight bevel acts to force the inlay edges into conforming with any imperfections or irregularities in the recess.

Commercially produced artistic inlays commonly come with a protective paper over the inlay, and a veneer background around the inlay. Leave the paper intact, and first cut away the veneer background close to the inlay border. Then carefully trim the remaining excess with hand tools.

The inlay is applied with the paper side up. After the inlay has been glued into the recess, several strips of masking tape can be used to hold it in position. Because inlays typically never seem to lie perfectly flat of their own accord, a block and weight is recommended over the inlay until the glue has set. Place a section of waxpaper over the inlay first, so excess glue will not adhere to any unwanted surfaces.

When applying inlaid banding to boxes, or any square or rectangular surface, the banding corners should be mitered for a good fit. Butted corners do not look nearly as neat or professional as mitered corners. If a series of miters must be cut, it is a good idea to build a miniature miter box especially for this purpose. You will need a very fine tooth saw (available at hobby stores) to make the cuts.

Inlaid banding is usually pressed in to place with the face of a hammer. Use the waxpaper and weight technique to hold it in position while the glue sets.

Inlays can be used in many different applications, from the purely whimsical to the practical. They may be used in traditional ways — to decorative period style furniture, or perhaps as an escutcheon around a key hole, or they may be used creatively — as an artistic tool of the designer-craftsman. Once you have discovered the ease with which inlaying is accomplished, we are certain it is a skill you will use frequently with confidence. W&J

## PUT THE WAX IN THE WOOD NOT JUST ON IT!



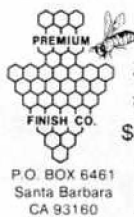
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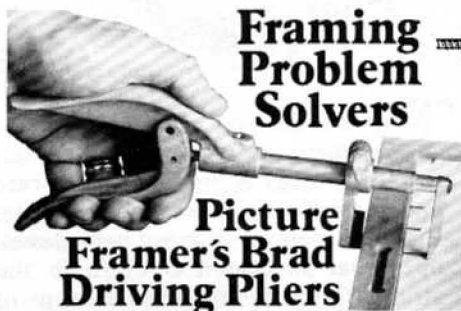
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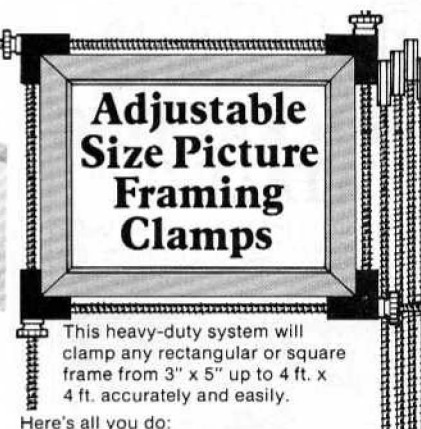


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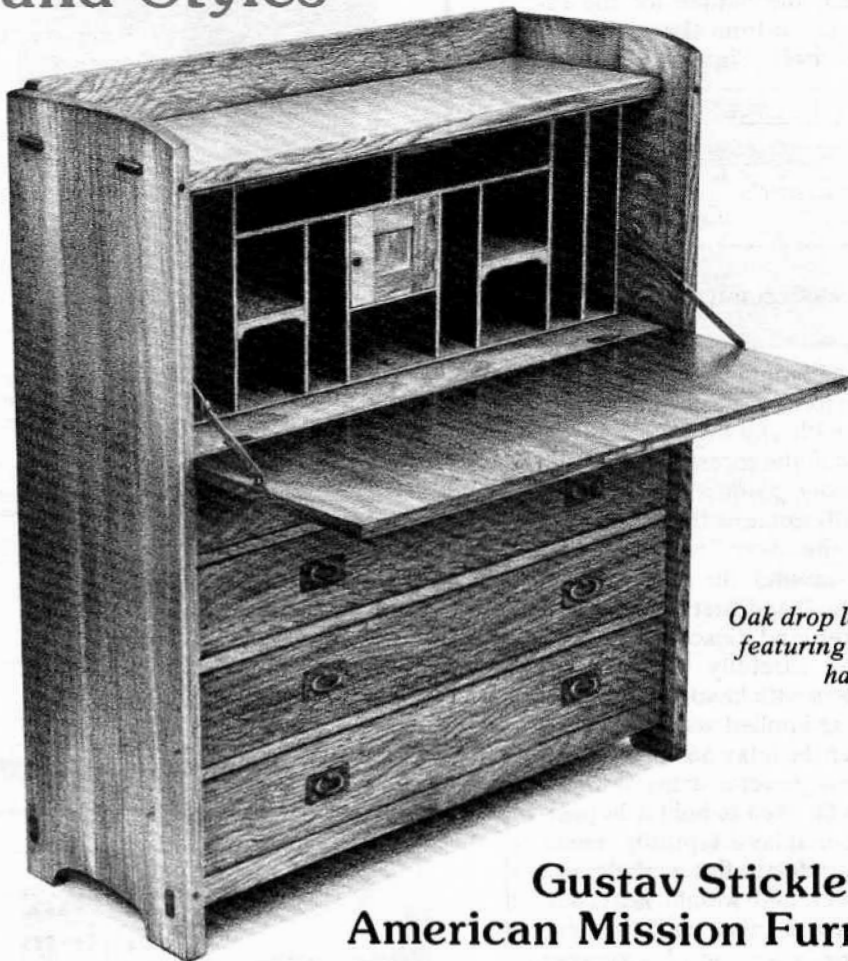
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## Furniture Periods and Styles



*Oak drop leaf desk featuring Stickley hardware.*

## Gustav Stickley and American Mission Furniture

**T**oward the end of the nineteenth century, designers and craftsmen began to rebel against the elaborate and pretentious extravagances of the Victorian period. A movement developed that advocated a return to the straightforward, utilitarian concept of design where form followed function.

The movement, known as the American Mission style, lasted for approximately 25 years — from 1895 to 1920. Its most successful and best known proponent was Gustav Stickley.

Stickley rose to prominence in a few short years — between 1900 and 1905. In response to the overbearing European influence on design, Stickley determined that Americans needed a style of their own. It was a style that, in keeping with Stickley's ideology, was not so much a separate style as it was a reflection of those qualities that he believed made America great. Stickley saw Americans "who desire in their homes a certain sturdy elegance, good construction, good craftsmanship, beautiful lines, rich and durable furniture." Toward this end, he developed a line of furniture that employed the through mortise-and-tenon joint, a

feature that proudly displayed (rather than concealed) the manner of construction. It was a theme that carried throughout Stickley's work, echoing his contention that "the constructive feature must be plainly visible, and declare the purpose and use of the work." He called his line of furniture *Craftsman*, in an effort to emphasize both the ideology behind his designs, and the fact that they were made largely by hand.

The American public, fed up with ornate Victorian reproductions that were often only poorly constructed imitations of the European originals, eagerly accepted Stickley's work. Indeed, his meteoric rise was so sudden that by 1901 he had begun publishing *The Craftsman*, a magazine devoted to his concept of design as it applied not only to furniture, but to interior decor and even architecture.

In 1905, Stickley moved to New York City, and in 1908 he opened the 600 acre *Craftsman Farms* in Morris Plains, New Jersey. It was a place where the Stickley ideal that "design must grow out of necessity" was put into practice in a sort of experimental

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cooperative community. In a few short years he had become something of a celebrity; an ideological hero with thousands of devout followers, and many more who imitated his style.

Although he sometimes used elm, mahogany, chestnut and ash, Stickley chose oak as the primary material for his furniture. He saw oak as the quintessential American wood — inexpensive and abundant — yet with superior structural strength and possessing a raw material beauty. His rectilinear designs reflected the Stickley belief that wood was not intended to be forced into unnatural shapes and forms. Oak was the wood that best fulfilled his commitment “to make pieces that are practical and comfortable, that would last a man’s lifetime without being much the worse for wear, the kind of things one could take pride in handing down to one’s grandchildren.”

As articles in *The Craftsman* magazine pointed out, Gustav Stickley’s concepts of design and order went far beyond furniture. He applied them to every aspect of life — even education — and his *Craftsman Farms* became something of a utopian experiment in his ideology. Although his furniture designs did change (becoming less severe and incorporating copper and pewter inlays under the influence of designer Harvey Ellis), Stickley steadfastly held to his belief in the ideal of the craftsman as a sort of “renaissance man.”

*The Craftsman* magazine featured everything from guest essays to house plans, and over the years he boldly experimented with various ways to apply his ideology to 20th century life. One such aborted plan was to reorganize his factories under the medieval “guild” system. It proved to be a plan that, like many of his ideas, looked great in theory but simply did not work in practice.

Stickley’s crowning achievement came in 1913 with the completion of the *Craftsman* building on 39th Street in New York City. The building was a center for displaying Stickley’s designs and publishing his magazine. It included a lecture hall, library, business offices, *Craftsman* clubhouses, and even a *Craftsman* restaurant. Everything was made-to-order Stickley, right down to the food served in the restaurant, which was all grown on the *Craftsman Farm*.

Gustav Stickley was on top of the world in 1913, and he arrogantly refused to see the cracks developing in his empire. His stubbornness, and uncompromising commitment to the

*Craftsman* ideal were blinding him to the realities of competing in the business world. Indeed, in 1913 Stickley paid himself the ultimate compliment when he wrote, “most of my furniture was so carefully designed and well proportioned in the first place, that even with my vast experience I cannot improve upon it.” With these fateful words Stickley signaled his professional demise.

The simple qualities that were the keys to the mass appeal of Stickley designs now worked against him. His furniture was easily copied and particularly suited to assembly line machine production. It was a supreme irony that the very *Craftsman* features that Stickley championed now made his designs the perfect subject for inexpensive reproductions. Stickley refused to alter his hands-on techniques, and a scant two years after his *Craftsman* building opened, he was forced to declare bankruptcy. As perhaps the final humiliation, in 1916 the bankrupt Stickley hired on as a consultant with the Simmons Mattress Company in his native Wisconsin. Not surprisingly, it was a short-lived arrangement.

Although Gustav Stickley died in relative obscurity in 1942, his *Craftsman* style had proved to be the cornerstone of the immensely popular American Mission style. Today, pieces imprinted with the traditional Stickley logo — a medieval joiner’s compass and the Dutch expression “Als ik kan” (roughly translated: All I can) — command prices that often range into the tens of thousands of dollars. His furniture is considered one of the hottest items in the antique market.



Oak lunch table showing pinned tenon construction.

It is in response to the intense interest in Stickley’s work that we offer plans for one of his classic chair designs (see page 34). It features a leather cushion, perhaps with an eye toward comfort, while retaining Stickley’s bold use of the mortise-and-tenon joint.

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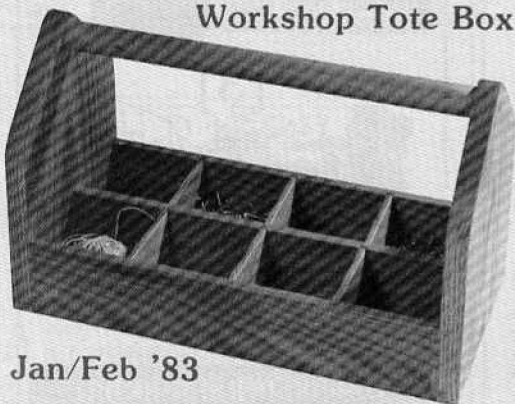
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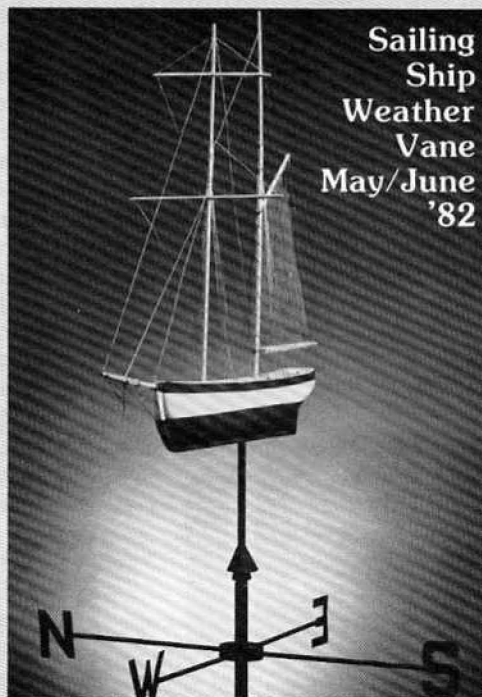
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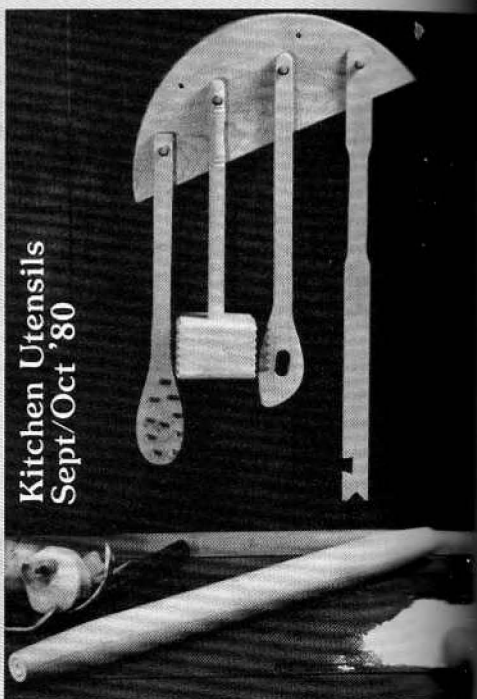
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Kitchen Utensils  
Sept/Oct '80

**Vol. 6 No. 6 Nov-Dec '82:** Lyre Clock, Geodesic Lighting Fixture, Sawhorse Dining Table, Oak Desk Clock, Shaker Wall Shelves, Old-Time Radio Case, Cider Press Lamp, Contemporary Hanging Light Fixture, Firewood Rack, Toy Tool Box, Christmas Tree Ornaments, Willie and Tuna Push Toy, Woodpile Trivet, Circle Cutting Router Jig, Articles: All About Box Joints, Don't Sell for Less than Cost, Finishing Tips.

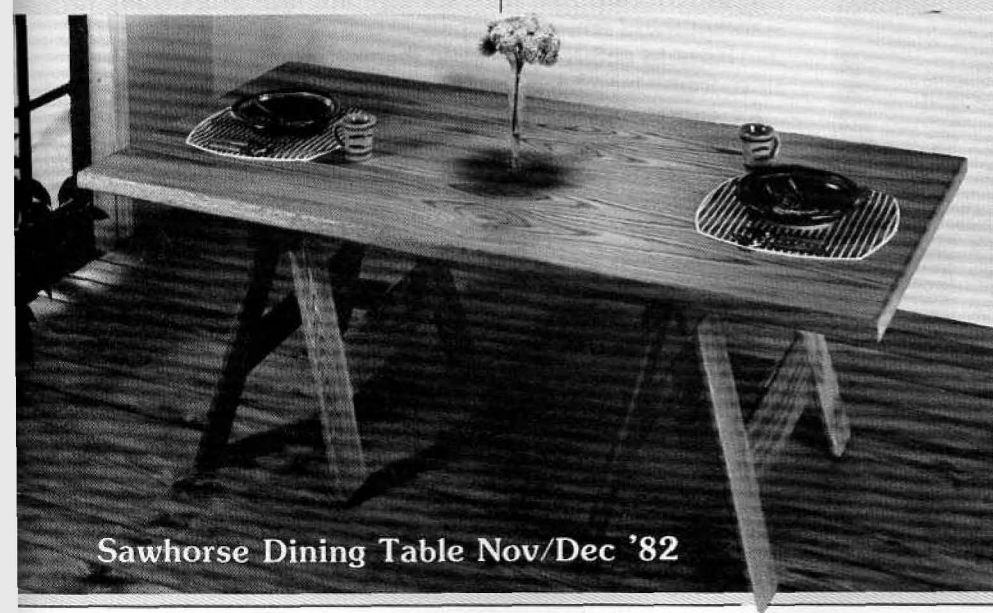
**Vol. 7 No. 1 Jan-Feb '83:** Workshop Tote Box, Tinsel-Art Mirror, European Spinning Wheel, Key Holder, Dump Truck Toy, Bang-a-Peg Toy, Puzzle, Wall Cabinet with Reverse Glass Stencil, End Grain Table Lamp, Butler's Tray Table, Contemporary Clock, Pine Cabinet, Articles: Miter and Spline Joints, The Added Costs of Being in Business, Selecting Clear Finishes.

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

**Vol. 7 No. 3 May-June '83:** Oak Pedestal Table, Drafting Table, Early American Wall Unit, Folding Snack Table, Pine Corner Cupboard, Toy Car with Boat & Trailer, Letter Opener, Contemporary Serving Tray, Hanging Mirror with Shelf, Carved Eagle, Early American Portable Bookcase, Hardwood Suppliers, Articles: Handtools and Table Saw Methods, Record Keeping: The Key to Profitable Costing, A Cure for Loose Legs.



**Empire Footstool  
Jan/Feb '82**



**Sawhorse Dining Table Nov/Dec '82**

**Vol. 7 No. 4 July-Aug '83:** Turned Lamp, Decoy Carving, Antique Sugar Chest, Record Album & Tape Cabinet, Chinese Tea Table, Old-World Weather Forecaster, Toy Tractor & Cart, Display Pedestal, Two Planter Projects, Collector's Plate Stand, Hardware Suppliers, Articles: Dovetail Joints: Part I, Keep Track of Costs or You'll Be Overtaxed, Some Spraying Techniques, Inlaid Edging.

**Vol. 7 No. 5 Sept-Oct '83:** Shaker Writing Desk, Modelmaker's Bench, Canning Jar Storage Shelves, Turned Bowl, Oriental Table, Router Table, Band Saw Box, Toy Pumper Firetruck, Toy Airplane, Spoon Rack, Magazine Rack, Bootjack, Furniture Kit Suppliers, Articles: Dovetail Joints: Part II, Some Thoughts on Low-Cost, No-Cost, Advertising, Correcting Flaws in the Finish, Routed Drawer Pulls, Work Wood Co-operatively.

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

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



**Oak Desk Clock  
Nov/Dec '82**

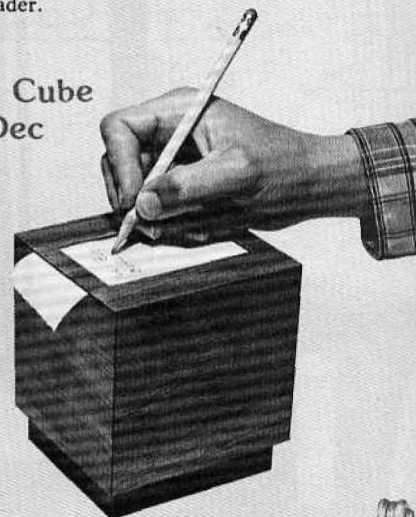
**Vol. 8 No. 2 Mar-Apr '84:** Shaker Wall Clock, Compact Dry Bar, High Chair, Kitchen Canister Set, Colonial Water Bench, Stacking Desk Trays, Wooden Brooches, Toy Bulldozer, Rocking Horse, Contemporary Table, Wall Hung Telephone Cabinet, Pipe Smoker's Organizer, Clock Parts Suppliers, Articles: Edge-Joining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

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

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

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

**Memo Cube  
Nov/Dec  
'81**



**Swinging Cradle  
May/June '82**

# Stickley Chair

The Gustav Stickley chair represented here is an original. It features Stickley's favorite type of joint, the pinned through mortise-and-tenon, and was fashioned entirely from mahogany. Although it looks somewhat angular and spare, the chair is surprisingly comfortable to sit in because the slatted back conforms to the body when pressed against.

## Period Project



Despite its linear appearance, the chair is not easy to build. As you will note in the front and side elevations, the front of the chair angles slightly back (2 degrees) and the back of the chair is  $1\frac{1}{4}$  in. narrower in width than the front (also a 2 degree offset). Because of these considerations, both the tenons and the tenon shoulders on the rails (E and F) must be angled, with respect to this 2 degree deviation. Indeed, where the lower rails (E) contact the back legs, it will be necessary to cut compound angles on both the tenons and shoulders in order to achieve a proper fit. Because it is far easier to cut angled tenons than angled mortises, all through mortises are cut at a straight 90 degrees. The blind tenon mortises are also all 90 degrees, except for the mortise where the upper rails (F) join with the back legs. This mortise is made by using the tenon as a guide, scribing and then cutting the mortise to fit.

There was much deliberation here concerning exactly how to present the project. Stickley cut his tenons by hand, with a backsaw, utilizing jigs to hold the stock in place and guide the saw. Power equipment will help simplify the tenoning process.

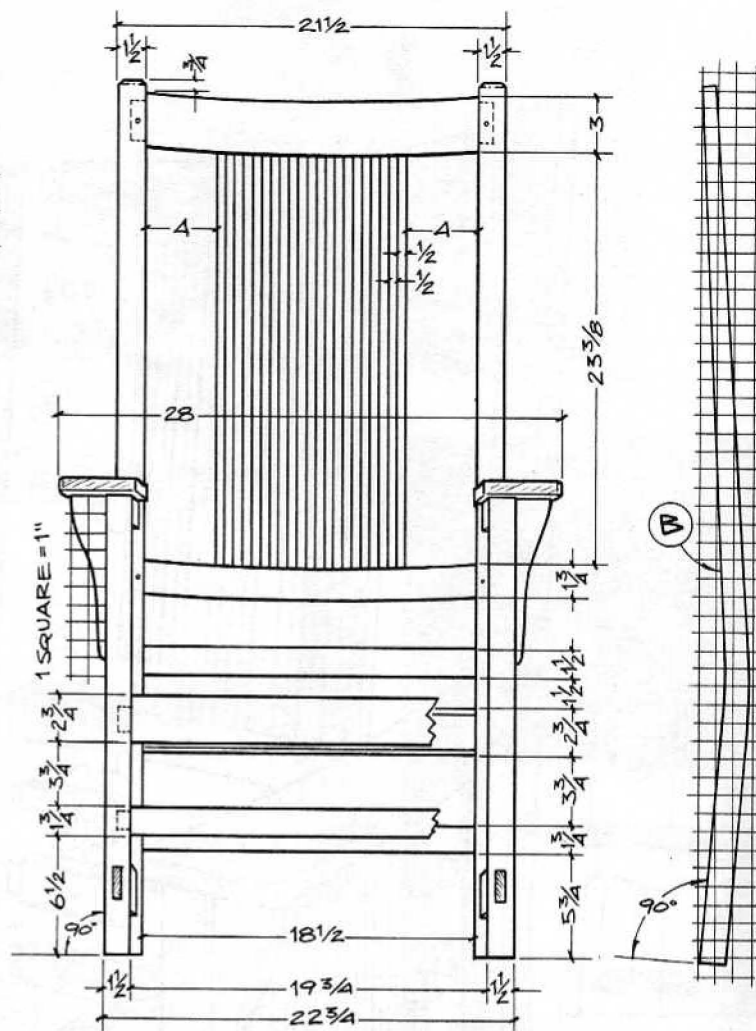
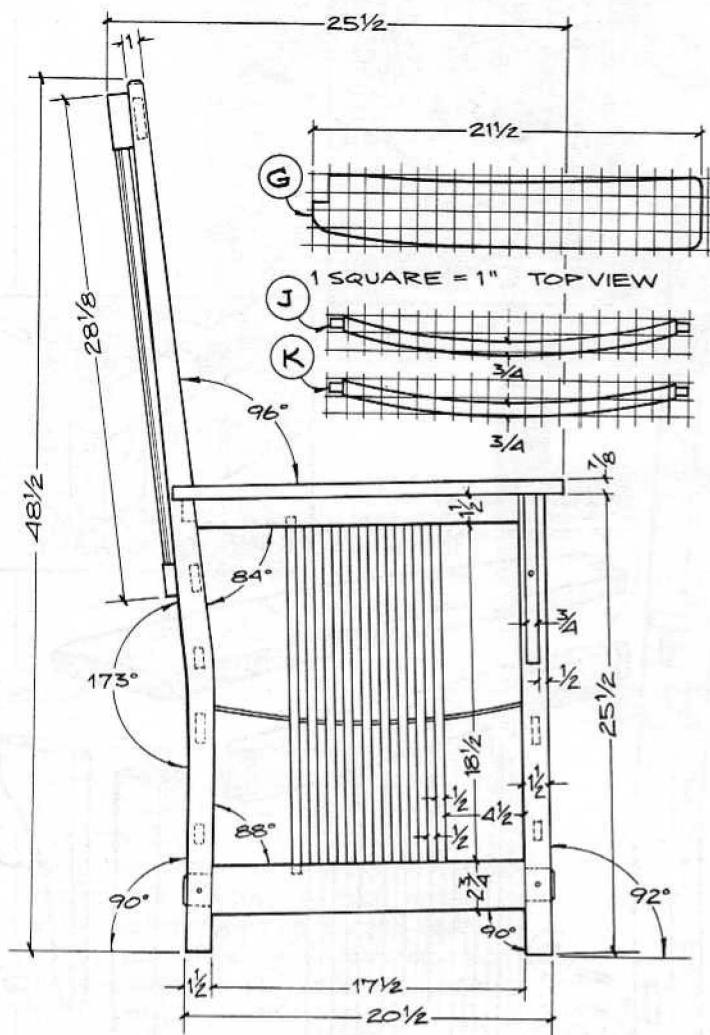
Begin by rough cutting stock to approximate length and width for all pieces. Cut the front legs (A), and the back legs (B) as shown in the grid pattern. Next cut the rails and stretchers. Because of the angled tenons it is best to allow a little extra on the overall length of these pieces. The tenons may be cut with the table saw. Position the stock upright, clamped to an auxiliary fence, and with the saw set at 88 degrees, rough out the tenon angles. Be careful to set the blade height so it will not cut deeper than the point where the shoulder begins. The shoulders should then be cut by hand with the backsaw.

Although the curved upper and lower stretchers (J and K) may be steam-bent, as Stickley's were, we suggest bandsawing them from solid stock. Refer to the grid patterns to make these pieces, the arm braces (Q), and the two arms (G). Note that the back legs are mortised slightly to accept these arms (see detail).

Parts M and N, and O and P serve a dual purpose. They are frame members, but they are also an ingenious system for supporting the seat cushion. After eighty years, our chair seems as strong as ever, indicating the system works. Note that these pieces are sized to allow for the thickness of the burlap webbing (S) and canvas (T), a total of about  $1/16$  in. As shown, the webbing and canvas are wrapped around the stretcher, and tacked in place.

The stretcher covers are then screwed to the stretchers, securely locking the webbing and canvas in place. These stretcher covers are cut from solid stock, using the dado head to chew out the center waste.

Assembling the chair is a process that will involve considerable dry fitting. Shoulders are final trimmed for the closest possible fit, and tenon length on the through tenons is cut to allow about  $1/8$  in. protrusion. The back and side ribs (H and I) should be cut about  $1/16$  in. shorter than their indicated length to ease the fitting process and allow for nominal longitudinal expansion during times of high humidity.



The rib mortises must be cut carefully. Unless you own a mortising device, this will require first drilling out and then squaring these mortises with a 1/2 in. chisel. Note that the mortises must be perfectly centered in the curved stretchers, since only 1/8 in. material is allowed on either side across the stretcher thickness. The ribs are *not* glued in place.

After assembly is complete, drill for and insert the pins (R) where indicated. The tenon pins serve to lock the frame together, insuring strength even if the glue should fail. Chamfer the through tenon ends, and the back leg tops as shown.

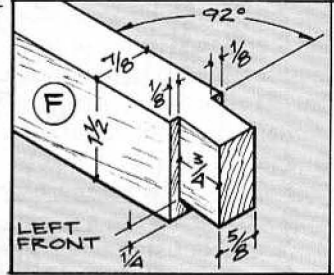
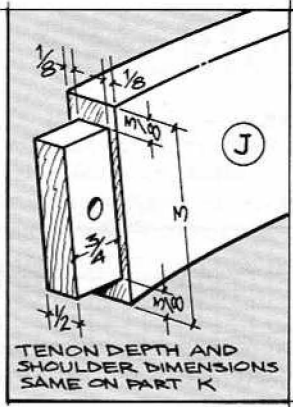
The seat cushion is leather covering a furniture grade 4 in. thick foam center. A cloth backing covers the bottom side of the cushion, and waste from the leather is sewn along the side edges of the cushion support. This is necessary because the canvas support shows up as a white line when the chair is viewed from the side, unless the leather edging is added to conceal it.

The leather should be available at craft shops, and the canvas, foam, webbing, and backing cloth are all available from an upholsterer, or an upholsterer's supply.

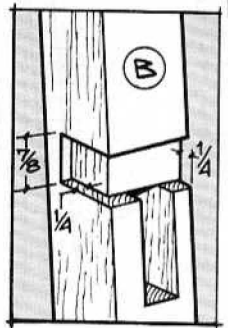
Stickley's favorite method of finishing involved a complicated chemical fuming process to darken the wood. This method applied only to oak and chestnut, however, and is not required for our chair since mahogany has its own deep, natural color. After a final sanding, simply hand-rub several coats of penetrating oil into the wood. Wwj

Bill of Materials  
(All Dimensions Actual)

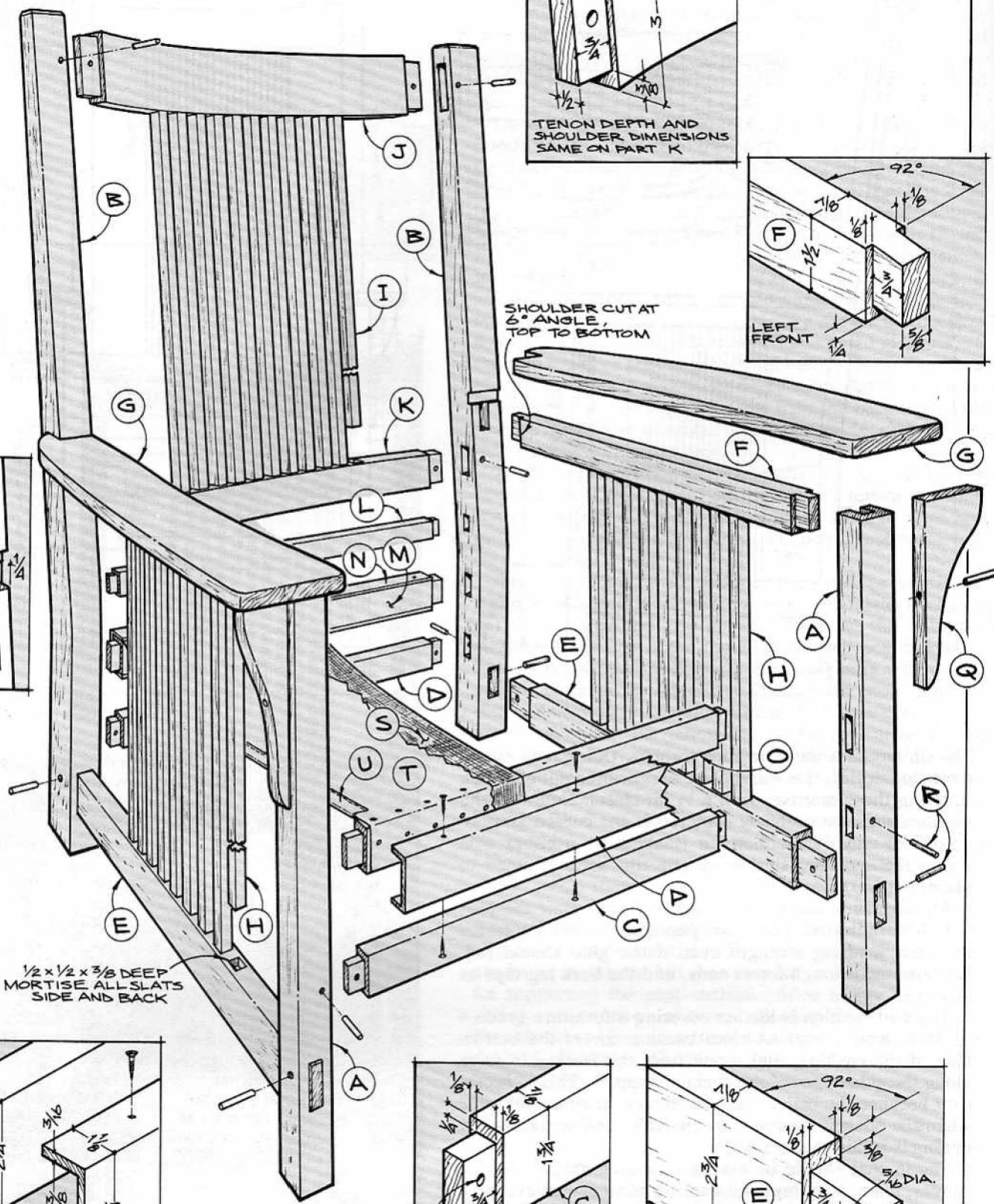
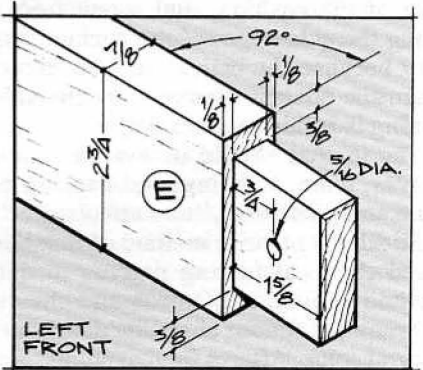
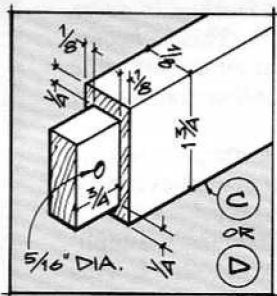
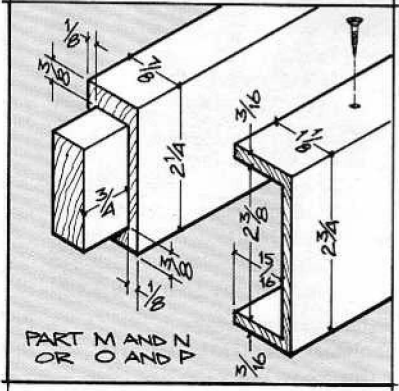
Part	Description	Size	No. Req'd.
A	Front Leg	1 1/2 x 1 1/2 x 25 1/2	2
B	Back Leg	See Grid Detail	2
C	Front Stretcher	3/4 x 1 3/4 x 21 1/4	1
D	Back Bottom Stretcher	3/4 x 1 3/4 x 20	1
E	Lower Rail	7/8 x 2 3/4 x 20 7/8	2
F	Upper Rail	7/8 x 1 1/2 x 19 1/2	2
G	Arm	See Grid Detail	2
H	Side Ribs	1/2 x 1/2 x 19 1/4	18
I	Back Ribs	1/2 x 1/2 x 24 1/8	11
J	Curved Upper Stretcher	3 in. wide/ See Grid	1
K	Curved Lower Stretcher	1 3/4 in. wide/ See Grid	1
L	Narrow Stretcher	5/8 x 1 1/2 x 20	1
M	Back Inner Stretcher	7/8 x 2 1/4 x 20	1
N	Stretcher Cover for M	1 1/8 x 2 3/4 x 18 1/2	1
O	Front Inner Stretcher	7/8 x 2 1/4 x 21 1/4	1
P	Stretcher Cover for O	1 1/8 x 2 3/4 x 19 3/4	1
Q	Arm Brace	See Grid	2
R	Pins	5/16 in. Diam.	As Req'd.
S	Burlap Furniture Webbing	3 1/2 in. wide	5 yds.
T	Canvas	1 sq. yard	
U	Leather Edging	2 in. wide by 18 in. long	2
		2 sq. yards brown upholstery grade leather	
		1 sq. yard 4 in. thick upholstery grade foam (firm)	
		1 sq. yard cloth backing (brown or black)	



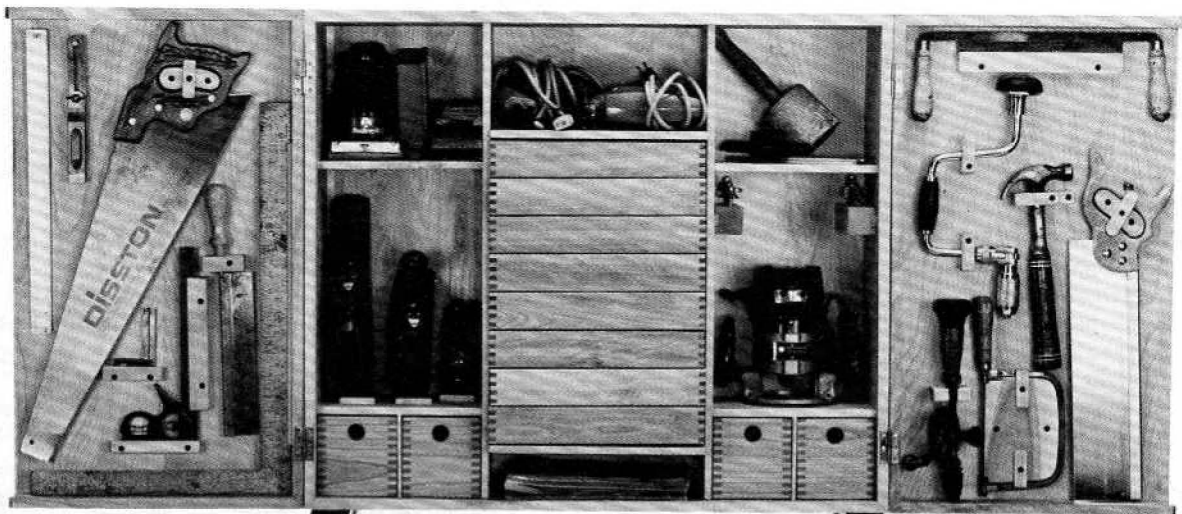
SHOULDER CUT AT 6° ANGLE, TOP TO BOTTOM



1/2 x 1/2 x 3/8 DEEP MORTISE ALL SLATS SIDE AND BACK



# Tool Cabinet



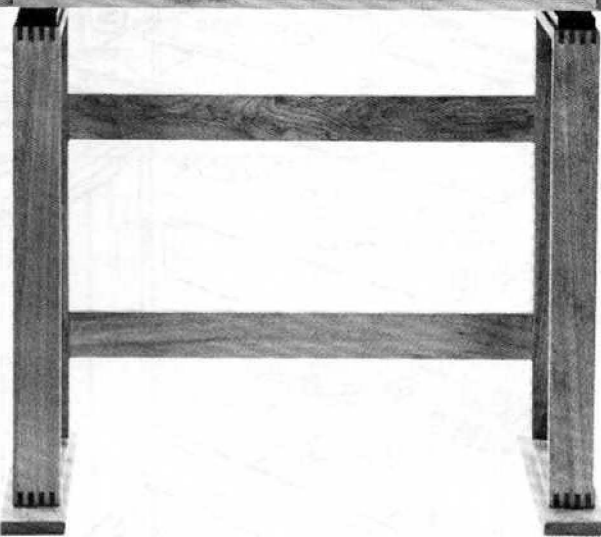
Woodworkers typically take great pride in their tools. Not surprisingly, over the years tool cabinet plans have always proven to be popular projects. We are confident that this cabinet, with its attractive book-matched panels, will be a centerpiece of any shop.

The primary purpose of a tool cabinet is to safely store and protect tools. It should also hold a sampling of the most common woodworking tools. The turnbutton system is an effective way of anchoring the tools so they do not move when the doors are opened. Naturally, the blocks and turnbuttons must be custom-made to fit your particular tools.

The cabinet is designed so the case and doors may all be cut from a single sheet of  $\frac{3}{4}$  in. thick 4 x 8 birch plywood (see cutting diagram). To achieve the book-matched effect that our cabinet features, you will need a sheet of birch plywood that displays repetitive figuring. Because birch plywood veneers are usually rotary cut, repetitive figuring is fairly common. Locate the doors on the plywood sheet to best take advantage of this figuring.

Should you decide to wall-mount the cabinet, the base can be eliminated. To build the base, first cut out the legs (A), rails (B), braces (C), stretchers (D), and feet (CC) all of which are cut from  $\frac{3}{4}$  in. thick solid birch stock. The legs and rails should be rough cut  $3\frac{3}{4}$  in. wide at this point. They are trimmed to their final 3 in. width after the box joints are cut. This is necessary in order to achieve the balanced look of the box joint, with the narrow pins on either end. (For an in-depth explanation of how to make box joints, refer to *The Beginning Woodworker*, in the November/December 1982 issue, Volume 6/Number 6.)

Mortise the inside edge of the back



legs to accept the stretcher tenon (see tenon detail) and glue up and clamp the base assembly. The braces are added to lend increased rigidity, and the feet are designed to prevent the cabinet from tipping forward when the doors are opened. The feet are glued and screwed to the base.

Cut the two blocks (E) from a dark wood such as ebony, rosewood, or black walnut. The contrast provided by these dark blocks is an attractive visual highlight of the cabinet.

The cabinet itself is built by first assembling the plywood sections as a box, and then cutting off the box front to form the cabinet doors. On the cutting diagram, the dotted lines through the sides, top and bottom represent the cuts that will separate the doors from the carcass. The double dotted lines down the center of the door section indicate the  $\frac{1}{2}$  in. wide strip that must be removed to allow for the  $\frac{1}{4}$  in. thick trim on the inside edge of each door.

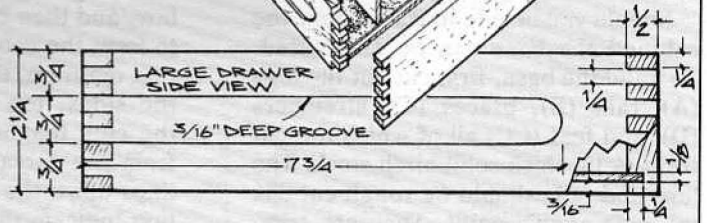
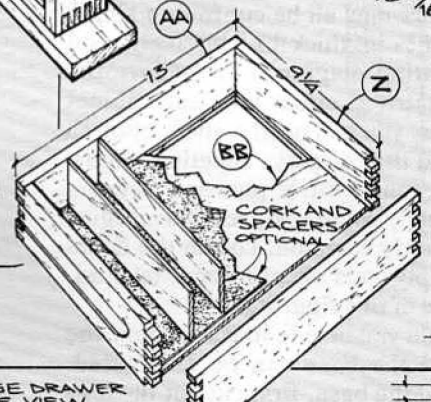
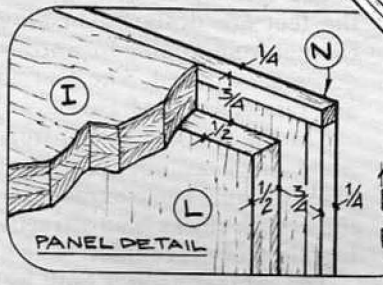
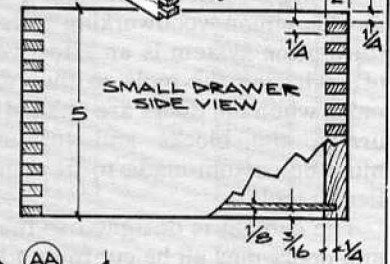
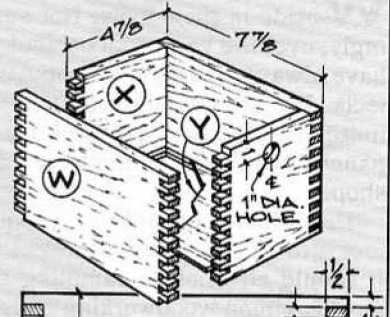
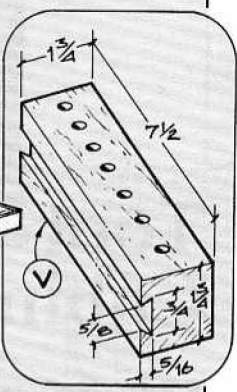
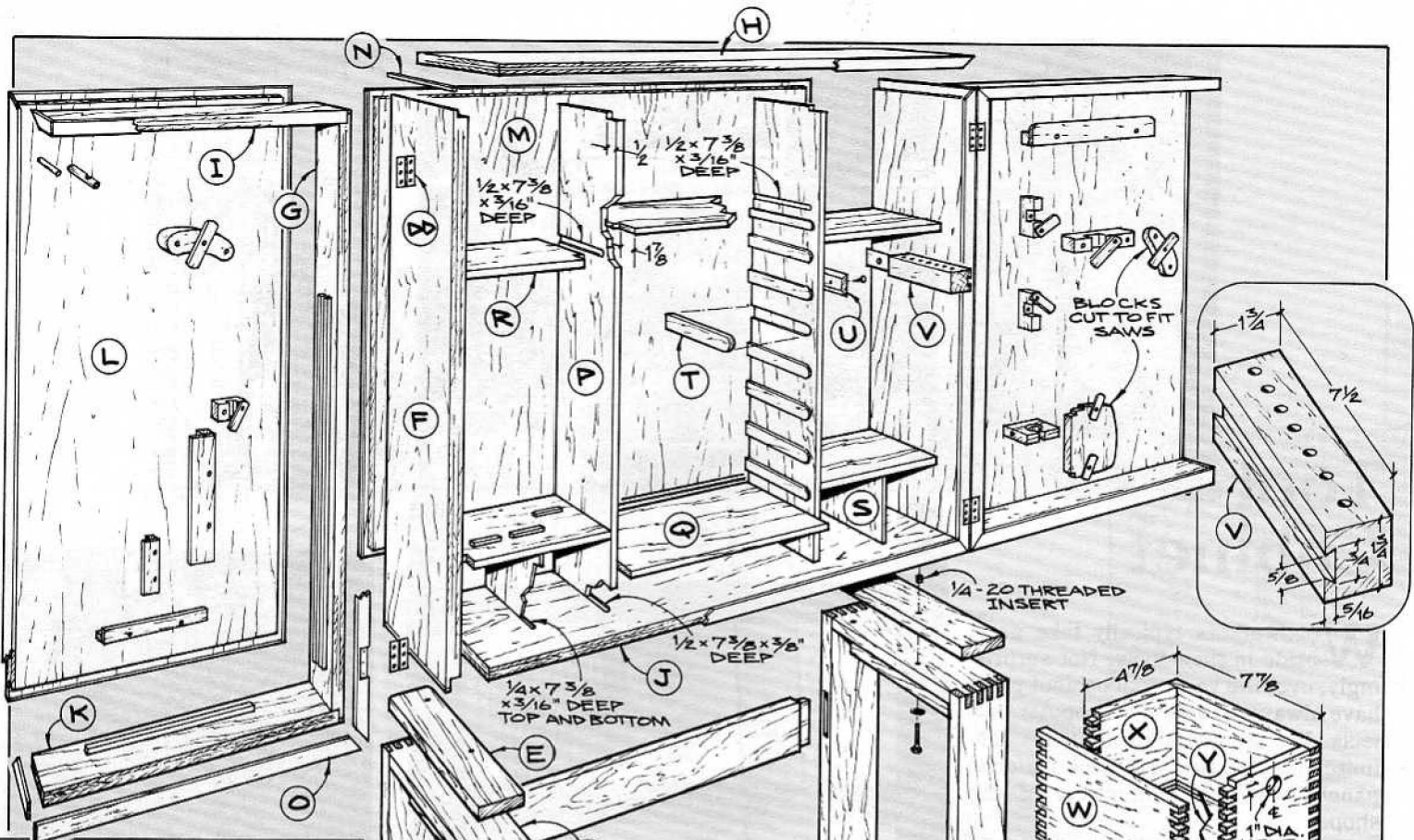
To begin, cut the two side sections (F plus G), the top section (H plus I) and the bottom section (J plus K). The width of each of these four pieces should be  $11\frac{1}{2}$  in., with the extra  $\frac{1}{8}$  in. allowed for the saw kerf when the doors are cut off later. As shown in the



joinery detail, the sides are rabbeted to accept the top and bottom sections. This is a full  $\frac{1}{2}$  in. by  $\frac{3}{4}$  in. rabbet, and the  $\frac{1}{4}$  in. square routed edge detail is cut later. Mortise the sides to accept the side shelves (R), and mortise both the top and bottom to accept the partitions (P) and dividers (S). Note that these blind mortises are cut through *from the back* so the partitions and shelves may be slid into place from the back after the carcass has been assembled. The shelves and partitions are made from  $\frac{1}{2}$  in. solid birch, and the dividers are  $\frac{1}{4}$  in. birch. The drawer cleat mortises in the partitions (see detail) must be cut before assembly.

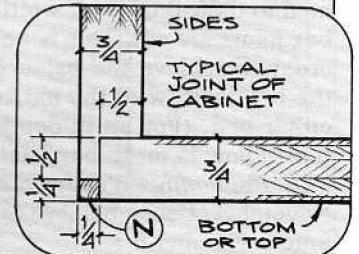
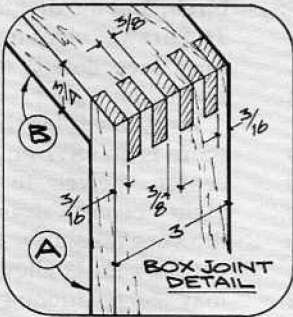
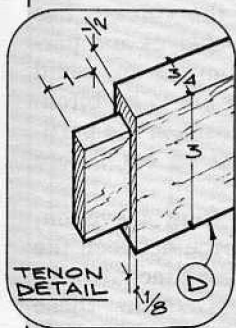
As shown in the front elevation, there is an  $18\frac{1}{2}$  in. space between the center shelves to accommodate the eight center drawers. Note these drawers take up a total of 18 in. This extra  $\frac{1}{2}$  in. is allowed so the drawers may be positioned with slight clear-

(continued on next page)



**Bill of Materials**  
(All Dimensions Actual)

Part	Description	Size	No. Req'd.
A	Leg	3/4 x 3 x 29 1/4	4
B	Rail	3/4 x 3 x 12	4
C	Brace	3/4 x 2 x 10 1/2	4
D	Stretcher	3/4 x 3 x 31 1/4	2
E	Block	3/4 x 2 1/2 x 11 1/2	2
F	Case Side	3/4 x 9 x 30 3/4	2
G	Door Side	3/4 x 2 x 30 3/4	2
H	Case Top	3/4 x 9 x 35	1
I	Door Top	3/4 x 2 x 17 1/4	2
J	Case Bottom	3/4 x 9 x 35	1
K	Door Bottom	3/4 x 2 x 17 1/4	2
L	Door Front	3/4 x 17 1/2 x 30 3/4	2
M	Back	3/4 x 30 3/4 x 35 1/2	1
N	Edging	1/4 x 1/4	As Req'd.
O	Trim	1/4 x 3/4	As Req'd.
P	Partition	1/2 x 7 7/8 x 29 3/4	2
Q	Center Shelf	1/2 x 9 3/4 x 13 3/4	2
R	Side Shelf	1/2 x 7 7/8 x 10 3/4	4
S	Divider	1/4 x 5 3/4 x 7 7/8	2
T	Drawer Cleat	3/8 x 3/4 x 7 1/2	16
U	Dovetail	5/16 x 3/4 x 7 1/2	2
V	Router Bit Block	1 1/4 x 1 1/4 x 7 1/2	2
W	Small Drawer Side	1/2 x 5 x 7 7/8	8
X	Small Drawer End	1/2 x 5 x 4 7/8	8
Y	Small Drawer Bottom	1/4 x 4 7/8 x 7 7/8	4
Z	Large Drawer Side	1/2 x 2 1/4 x 9 3/4	16
AA	Large Drawer End	1/2 x 2 1/4 x 13	16
BB	Large Drawer Bottom	1/4 x 8 3/4 x 12 1/2	8
CC	Foot	3/4 x 4 x 15	2
DD	Hinge	2 Inch	2 Pair



ance between them, eliminating any tendency they might have to bind on each other.

With the partitions and shelves in place you may now add the front and back panels. Referring to the cutting diagram, you will note that both panels are the same size. The front and back panels are rabbeted around their perimeter to fit the carcass, as shown in the panel detail. Again, this is a full  $\frac{1}{2}$  in. by  $\frac{3}{4}$  in. rabbet.

After the front and back have been glued in place you will have a six-sided box. Using a router equipped with an edge guide and a  $\frac{3}{8}$  in. rabbeting bit, cut the  $\frac{1}{4}$  in. square rabbet along all of the "box" edges. To avoid any tearing or splintering, work the router with respect to the face grain direction of the plywood. Next, cut the front door

section away from the cabinet. At this point the door section will be 2 in. wide, and the cabinet section will be 11 in. wide. Saw the door section in half to form the individual front doors. As noted earlier, a  $\frac{1}{2}$  in. strip must be removed to allow for the trim on the door inside edges.

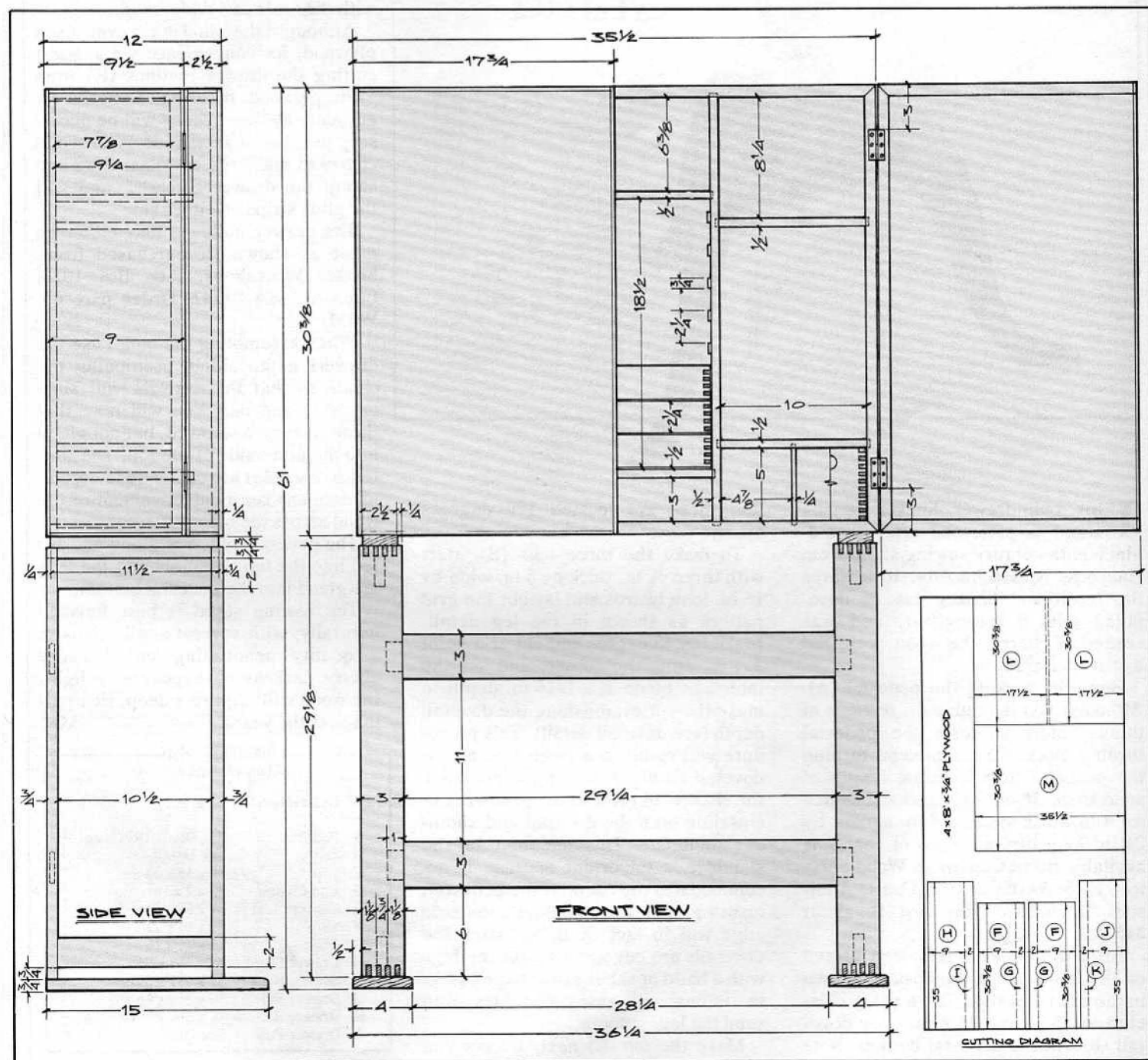
Add the birch edging (N) to the previously routed rabbets and the birch trim (O) along all exposed plywood edges. The  $\frac{1}{4}$  in. square edging should be cut slightly oversize to allow for final sanding, and the  $\frac{1}{4}$  in. thick by  $\frac{3}{4}$  in. wide trim should be cut slightly wider than  $\frac{3}{4}$  in. so it may later be sanded perfectly flush. Both the edging and trim are mitered at corners.

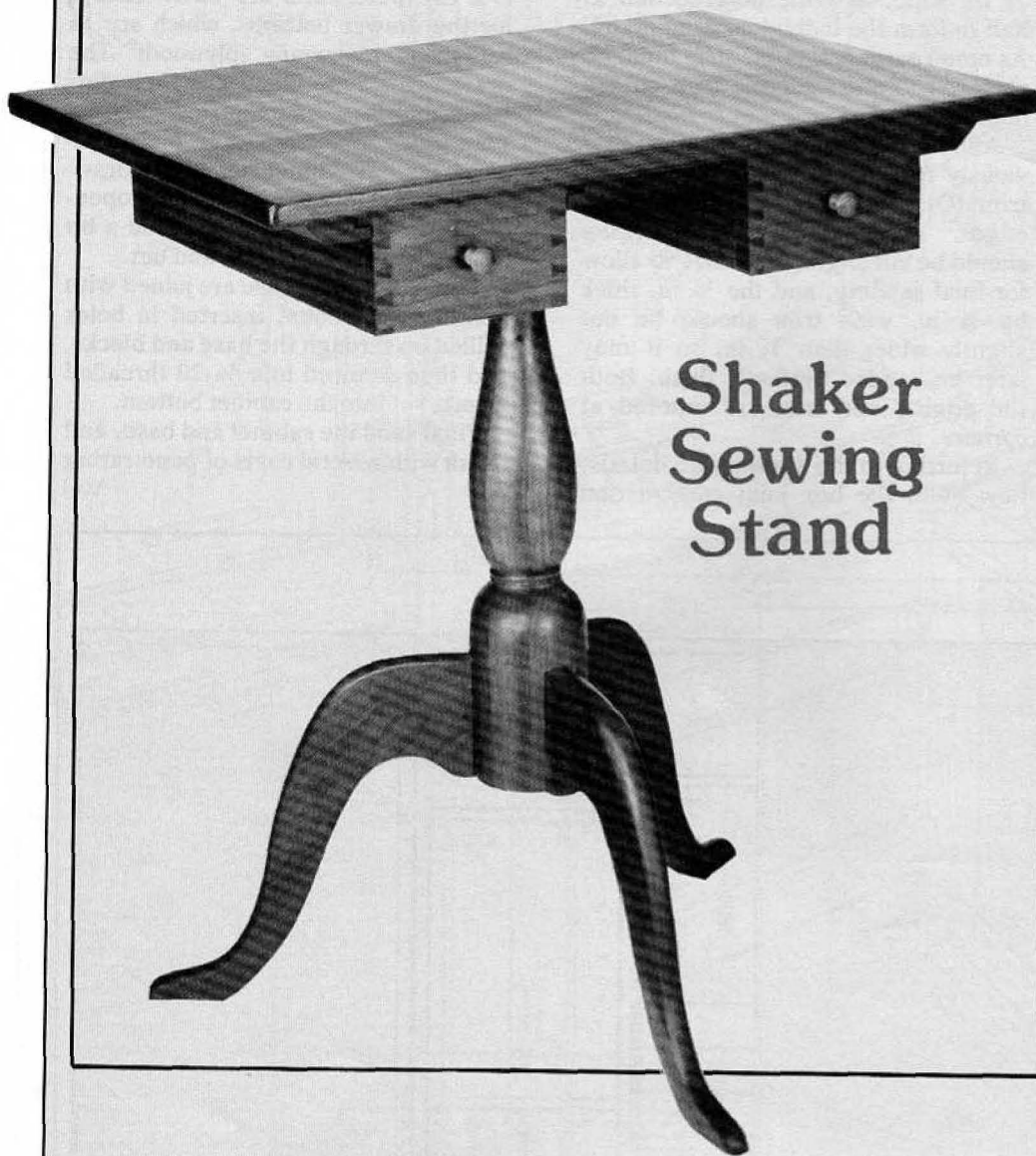
Referring to the appropriate details, now build the box joint construction

large and small drawers, and cut the drawer cleats (T), the dovetails (U) and their corresponding router bit blocks (V). All these parts are birch, except for the drawer bottoms, which are  $\frac{1}{8}$  in. thick mahogany plywood. The drawer cleats are glued into their partition mortises, and the dovetails are both glued and screwed in place. Because we have dimensioned the drawers exactly to their individual openings, it will be necessary to sand a bit so they will slide easily in and out.

The cabinet and base are joined with four machine bolts, inserted in holes drilled up through the base and blocks, and then screwed into  $\frac{1}{4}$ -20 threaded inserts set into the cabinet bottom.

Final sand the cabinet and base, and finish with several coats of penetrating oil. Wvj





## Shaker Sewing Stand

**T**his twin-drawer Shaker sewing stand is patterned after a mid-nineteenth century sewing stand from Hancock, Massachusetts. It features the traditional Shaker use of dovetailed joinery throughout, and was crafted of cherry, the wood preferred by the Shakers.

Begin by making the pedestal (A). Although you may glue up sections of thinner stock to form the pedestal turning block, we recommend turning the pedestal from a single length of solid stock. If you have no local source for 4 in. thick stock, a 4 in. square by 24 in. long turning block of cherry is available from: Craftsman Wood Service, 1735 West Cortland Court, Addison, IL 60101. The cost is about \$15.00.

After the pedestal has been turned on the lathe to the dimensions shown in the front elevation, use a sharp chisel to cut the three 9/16 in. deep dovetail slots in the pedestal bottom. Note

that these are located 120 degrees apart.

To make the three legs (B), start with three 3/4 in. thick by 6 in. wide by 16 in. long boards and lay out the grid pattern as shown in the leg detail. Make the 45 degree end cut at a point 3 1/2 in. from the corner, and set the table saw blade at a 1/16 in. depth to make the cut establishing the dovetail depth (see dovetail detail). This procedure will result in a clean line at the dovetail shoulder, helping to minimize the chance for error in the handwork of chiseling both the dovetail and shoulder undercut. This undercut in the shoulder is important because it accommodates the curve of the pedestal, insuring that the shoulder's outside edge will in fact fit tight. After the dovetails are cut you may cut the legs with a band or saber saw. Shape the 1/2 in. radius with rasps and files, and sand the legs smooth.

Make the top (C) next. Unless you

have access to 18 in. wide cherry boards, it will be necessary to glue up several smaller boards to achieve the total width. The end and center cleats (D and E) may be cut to size, and the cleat rabbets can be cut with the dado-head. Use a hole saw to cut the 2 in. hole in the center cleat that will accommodate the pedestal tenon. Both the top, pedestal and legs should be final sanded before assembly.

Next rip 1/2 in. square stock and cut to length the stop (F) and the four glides (G).

To make the two drawers, first cut the drawer fronts (H), backs (I) and sides (J) to length and width. The dovetails may either be cut by hand or, if you have the proper bits and jigs, with the router. The 1/4 in. square drawer bottom grooves are best cut with the table saw dado-head.

Although the Shakers never used plywood, for convenience we suggest cutting the drawer bottoms (K) from 1/4 in. plywood. If you are a stickler for authenticity, however, it will be necessary to resaw a section of 3/4 in. solid cherry to make the bottoms. Glue and clamp the drawer carcasses, and add the glide strips on either side.

The drawer pulls (L) may either be made as shown, or purchased from: Shaker Workshops, P.O. Box 1028, Concord, MA 01742. Order part no. W331.

When assembling the table, use the drawers as an aid in positioning the cleats so that the drawers will slide easily in and out. You will note that these cleats are screwed, but not glued into the underside of the top. The slotted screw holes are designed to accommodate any seasonal movement of the wood across the top.

The pedestal tenon is glued and fitted into the top assembly and the legs are glued into the pedestal bottom.

The sewing stand is best finished naturally, with several applications of a quality penetrating oil. Because cherry darkens on exposure to light, the wood will acquire a deep, rich patina over the years. WwJ

### Bill Of Materials (All Dimensions Actual)

Part	Description	Size	No. Req'd.
A	Pedestal	3 1/2 Dia. x 19 1/2 long	1
B	Leg	See Detail	3
C	Top	3/4 x 18 x 24	1
D	End Cleat	7/8 x 2 x 16	2
E	Center Cleat	7/8 x 5 1/2 x 16	1
F	Stop	1/2 x 1/2 x 21	1
G	Glide	1/2 x 1/2 x 16	4
H	Drawer Front	3/4 x 3 1/2 x 5 3/4	2
I	Drawer Back	1/2 x 3 1/2 x 5 3/4	2
J	Drawer Side	1/2 x 3 1/2 x 16	4
K	Drawer Bottom	1/4 x 5 1/4 x 15 1/4	2
L	Drawer Pull	See Detail	2



# Lighted Display Pedestal

Contemporary style display pedestals are showing up frequently in furniture showrooms. Perhaps in response to the American fascination with collecting art and antiques, we are seeking better ways to display our most prized possessions.

This lighted display pedestal is ideal for vases, pottery, statuary, or even plants. It's gentle light highlights whatever is on display, and gives the pedestal an added dimension of use as a night light.

The pedestal is easy to build, using  $\frac{3}{4}$  in. particle board, standard veneers, and  $\frac{3}{4}$  in. solid stock. To begin, cut a section of  $\frac{3}{4}$  in. particle board, 26 in. long by 38 in. wide, and veneer both sides. Any inexpensive birch or luan mahogany veneer will do for the interior veneer (B). For the exterior veneer (C), however, select a distinctive burl, or crotch veneer in one of the more colorful exotic woods. A broad selection of veneers is available from: Constantine, 2050 Eastchester Road, Bronx, NY 10461.

When the four sides (A) are cut from a single section of veneered particle board, the veneer faces will, of course, not match. Should you choose to purchase matching veneers (cut from the same flitch and sold in consecutive order) it will be necessary to cut out and veneer each pedestal side separately. Our pedestal, featuring book-matched olive ash burl, was fashioned in this manner.

After the four veneered sides have been cut to size, miter them lengthwise, then use the table saw dado-head to cut the  $\frac{3}{4}$  in. wide by  $\frac{1}{4}$  in. deep dados to accept the particle board bottom piece (D). The cutouts in each side of part D provide ventilation for any heat that builds inside the pedestal when the light is on. Next, drill a  $\frac{3}{8}$  in. hole through the bottom to accept an electrical cord and mount the porcelain fixture (I) in place.

After the four sides and bottom have been glued up, cut the  $\frac{1}{4}$  in. by  $\frac{1}{4}$  in. rabbets for the edging (G). These rabbets may be cut on the router table, or with the table saw dado-head. The  $\frac{5}{16}$  in. square edging is purposely oversize, so that it may later be sanded flush.

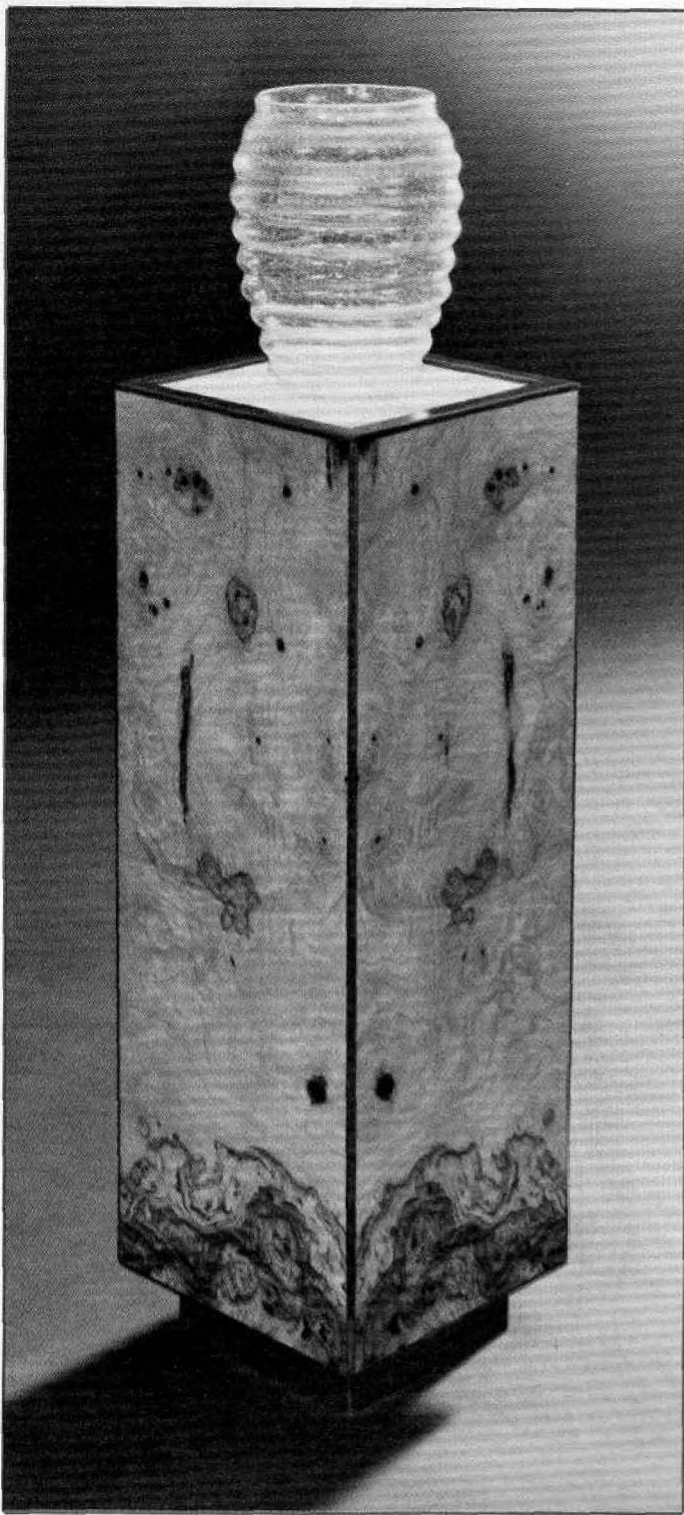
The pedestal base (E) is  $\frac{3}{4}$  in. solid stock, mitered and glued up into a simple four-sided box. Resaw  $\frac{3}{4}$  in. stock to form the trim (H), both top and bottom, and cut the four cleats (F) to fit snugly inside the pedestal, forming a rest for the glass top (J). Note that both the trim and cleats feature mitered corners, and that one side of the base must be notched to accommodate the electrical cord.

The solid stock for parts E, F, G, and H can be almost any hardwood, although the pedestal will look best if you select a wood that contrasts distinctively with the face veneer.

Finally, assemble the various pedestal parts as shown in the illustration, gluing and clamping all mating surfaces. You will note that the cleats are inset  $\frac{1}{2}$  in. below the pedestal top, enabling the trim to serve as a border around the glass. This will help prevent objects that are displayed from sliding off the pedestal. The frosted glass top, which rests on four felt dots positioned in the cleat corners, should be cut slightly undersize.

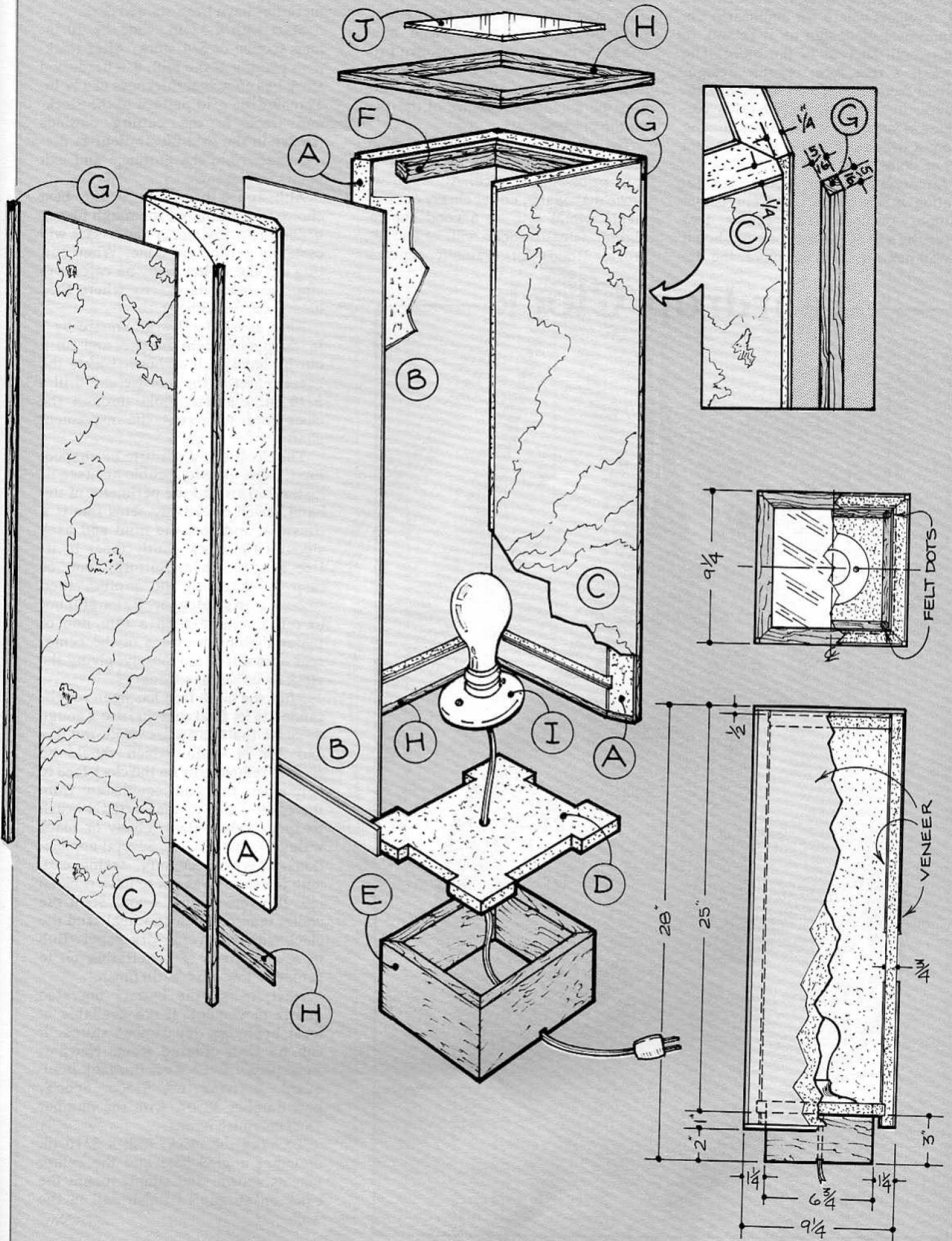
The lighted feature of the pedestal is an option, and can be eliminated if it is not desired. Should you include the light, however, it is a good idea to install a line switch in the cord. For safety's sake, it's best to use a bulb no bigger than 25 watt.

The pedestal may either be finished with penetrating oil or, if you desire a gloss finish, with lacquer.



Bill Of Materials  
(All Dimensions Actual)

Part	Description	Size	Quantity
A	Side	$\frac{3}{4}$ x $9\frac{1}{4}$ x $25\frac{1}{2}$	4
B	Interior Veneer	$1/28$ Thick	As Req'd.
C	Exterior Veneer	$1/28$ Thick	As Req'd.
D	Bottom	$\frac{3}{4}$ x $8\frac{1}{4}$ x $8\frac{1}{4}$	1
E	Base	$\frac{3}{4}$ x $3$ x $6\frac{3}{4}$	4
F	Cleat	$\frac{1}{2}$ x $\frac{3}{4}$ x $7\frac{3}{4}$	4
G	Edging	$5/16$ x $5/16$ x $25\frac{1}{2}$	4
H	Trim	$\frac{1}{4}$ x $7\frac{1}{4}$ x $9\frac{1}{4}$	8
I	Porcelain Fixture	Standard $4\frac{1}{2}$ in.	1
J	Glass	$\frac{1}{4}$ x $7\frac{5}{8}$ x $7\frac{5}{8}$	1



This teardrop clock is one of those projects where we emphasize the importance of design as it relates to the overall success of the piece. The clock is a free form organic design, carved from a single block of 8/4 in. mahogany stock. It incorporates elements of various natural forms, among them a droplet of water and a manta ray or skate.

Although form was a prime consideration in the piece, its form is not without purpose. The center tear serves as a hanger for the clock when it is wall mounted. Furthermore, the de-

sign is consistent; note how the teardrop motif is repeated throughout, right down to the tiny incised hour marks. When designing your own projects it is important to remember that form and function are integral. There must be a sensible balance of the two for the piece to work.

The selection of an attractively grained section of stock for this piece is of prime importance. Although we chose mahogany, either cherry or curly maple would also be a good choice. Lighter colored woods will, of course, provide the most dramatic contrast

after the center teardrop and hour markings have been stained dark.

Start with a 12 in. wide by 20 in. long section of 8/4 stock. After thickness planing at the mill, 8/4 hardwood stock has an actual thickness of 1 3/4 in. Transfer the grid pattern to the stock, and trace in the cutting outlines (shown in the grid illustration) as dotted lines. Note the entrance and exit points for the saw.

Although a band saw is the best choice for cutting out the rough forms, if none is available, a saber saw will certainly get the job done. When cutting out the center tear, be careful to stop the saw cuts exactly where they meet (see illustration).

Next, mark the 2 1/4 in. square by 1 in. deep movement mortise, and cut it out by hand with a chisel. Locate the exact center of the mortise and drill a 5/16 in. diameter hole through the clock face to accept the movement shaft.

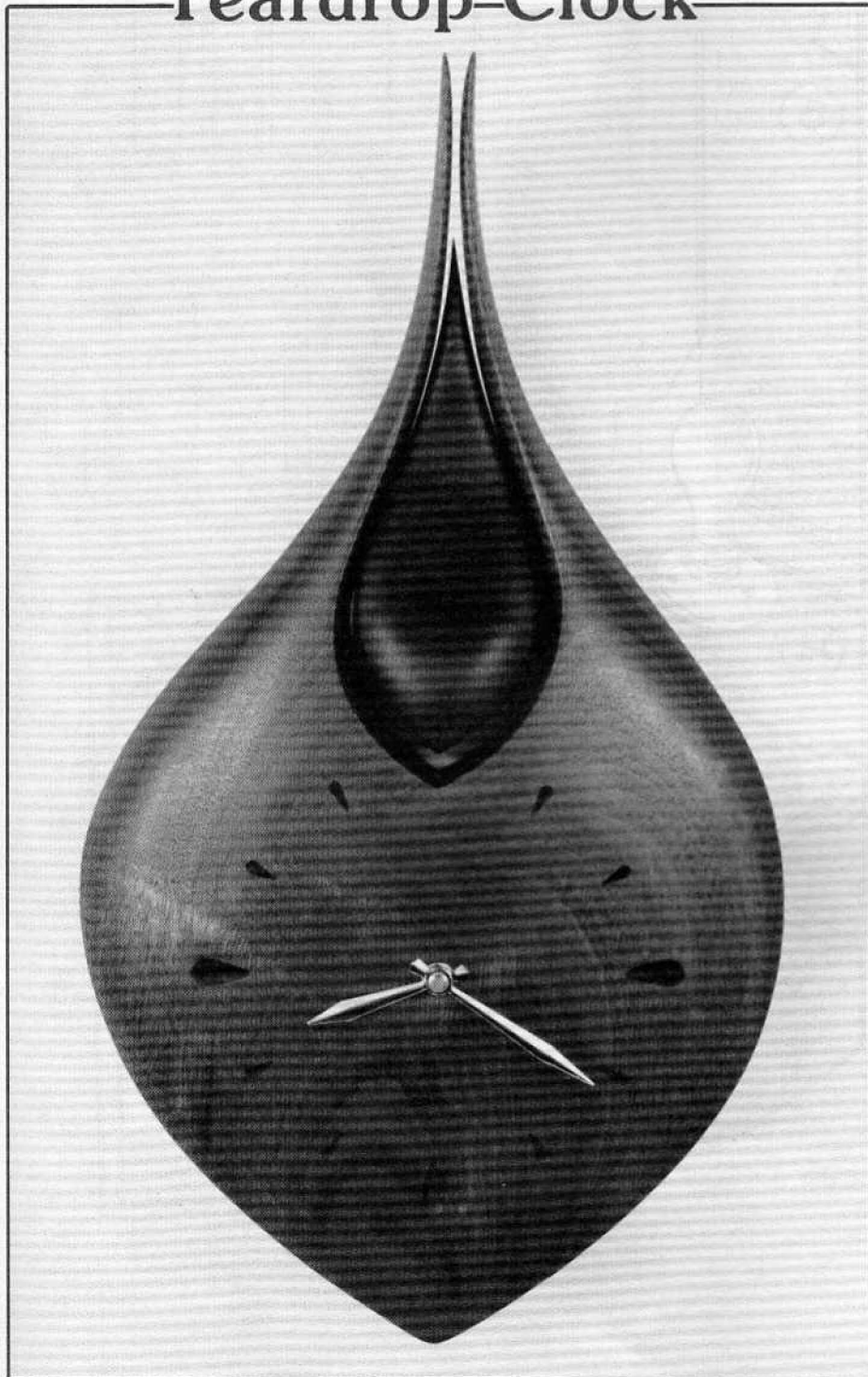
The clock is now ready to be shaped. First, draw the edge profile line (see illustration) around the perimeter of the band sawed clock body. This line is a constant, and both the front and back sides of the clock gently taper to it. Use a spokeshave, Surform tool, or rasp to shape to the profile, then smooth with sandpaper. Be careful not to remove more than a thin line of material from the sides of the center tear or it will fit too loosely, giving the clock an unbalanced look.

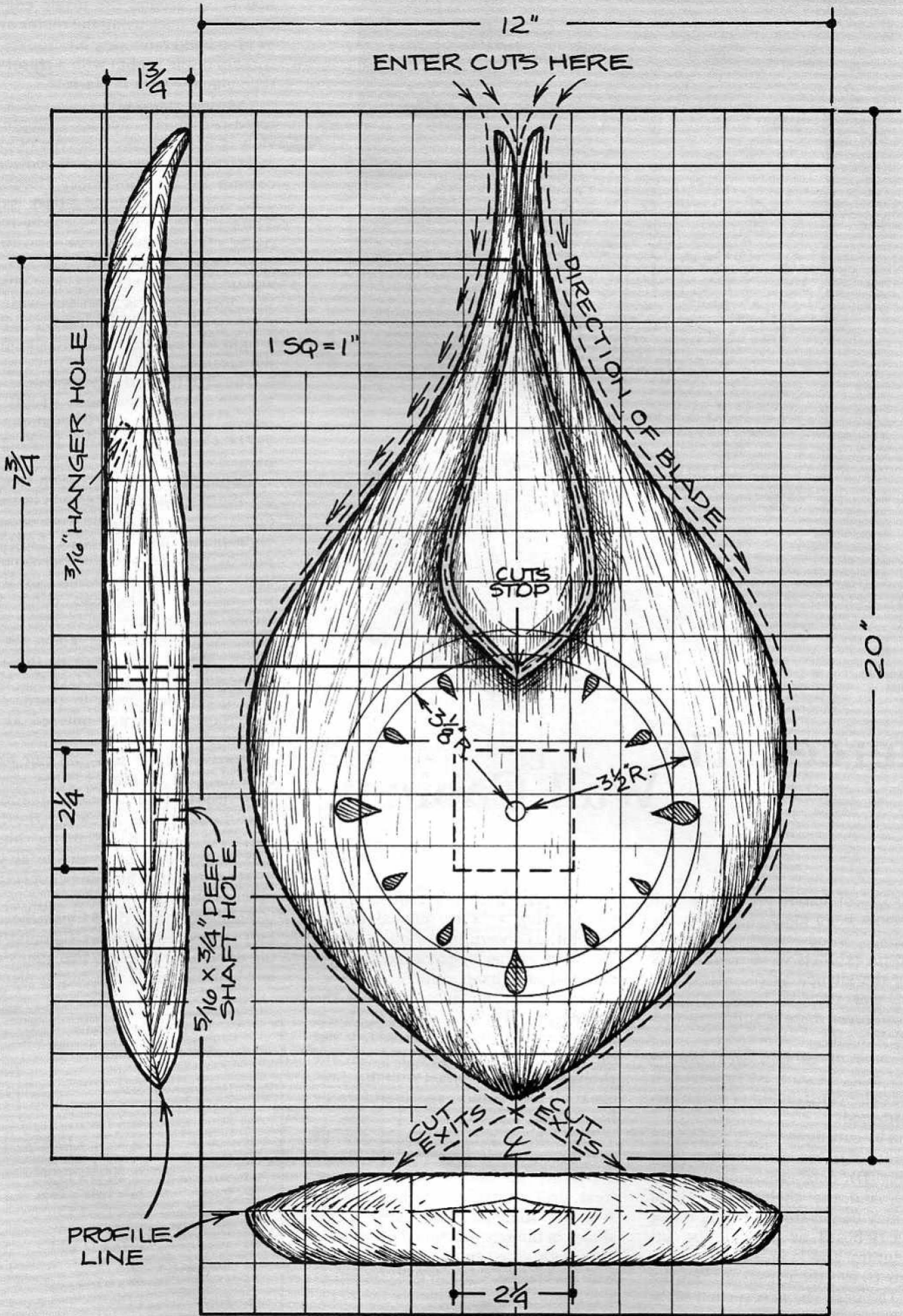
After the clock face has been rough-sanded to its final contour, use a gouge to incise the hour tears. Note the 3 1/4 and 3 1/2 in. radii, which should be scribed temporarily on the clock face to help locate the tears equidistant from the center. Use a small artist's brush to apply a dark stain (ebony or black walnut) to these tears. Several applications may be necessary, taking care with the stain so as not to have it bleed into the surrounding wood. Stain the center tear to match and final sand the clock with 360 wet-or-dry paper. Rub in several coats of penetrating oil to achieve a low-gloss satin finish.

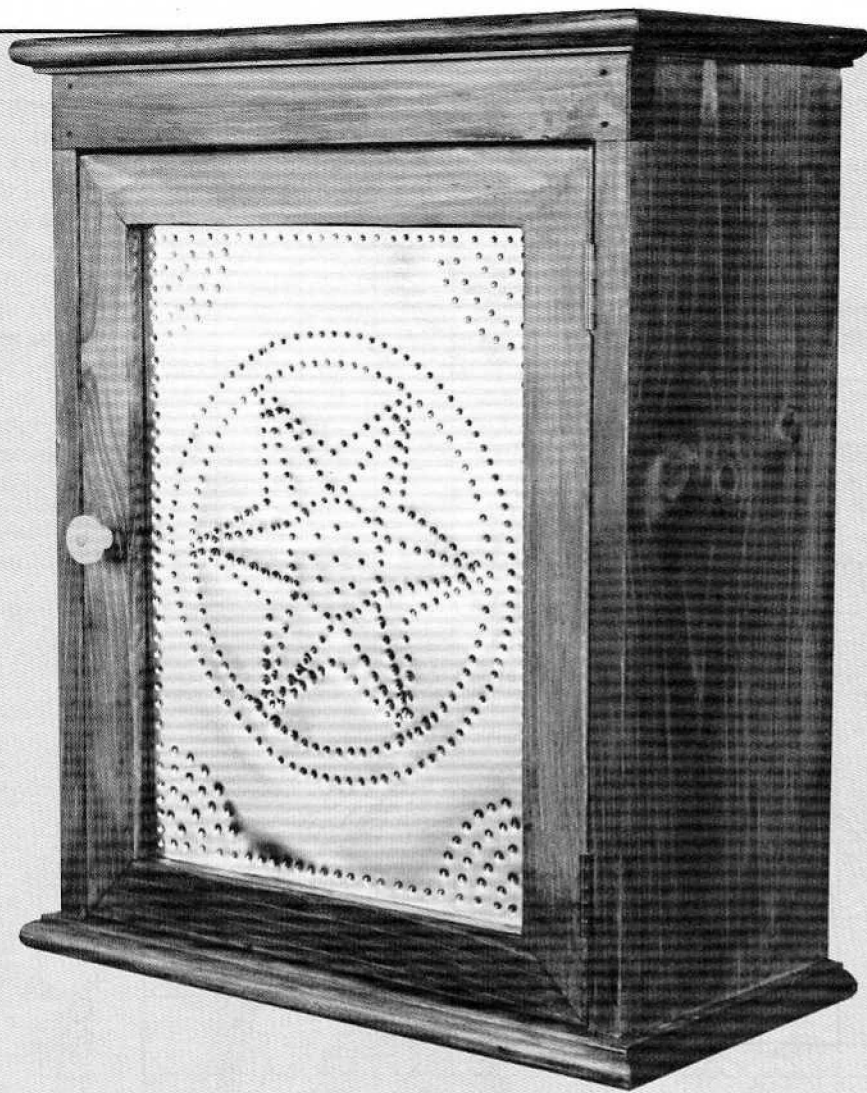
Next, install the battery operated quartz movement. If not available at local hobby or department stores, it can be mail ordered from: Newport Enterprises, 2313 West Burbank Boulevard, Burbank, CA 91506. Specify part number 28507, with the number 18 brass finish hands.

To hang the clock, drill a 3/16 in. diameter angled hole into the center tear as shown, and simply mount the clock on an angled finish nail in the wall.

## Teardrop Clock







## Pierced Tin Wall Cabinet

**T**his Colonial style pierced tin wall cabinet is an ideal project for the beginning woodworker. Although pierced tin cabinets were traditionally used in the kitchen as pie safes, this cabinet will provide handy storage space wherever there is sufficient wall space to hang it.

This type of cabinet was usually made of pine, as ours is. However, it could also be constructed of an attractive hardwood.

Begin by cutting to length and width the sides (A), top (B), bottom (C), stretcher (D), door rails and stiles (F and G), and the shelves (J), all of which may be cut from a single 8 foot long 1 x 10 board, as shown in the cutting diagram. The  $\frac{3}{8}$  in. square retainer strips (I) are then resawn from the scrap. The back (E) is a section of  $\frac{1}{4}$  in. thick plywood.

The decorative edge around the cab-

inet top and bottom is cut with the router using a  $\frac{3}{8}$  in. piloted round-over bit, as shown in the edge detail. The  $\frac{1}{4}$  in. radius is then added using a rasp and some hand sanding.

Next, notch the sides to accept the stretchers and drill out the  $\frac{1}{2}$  in. dowel holes for the shelf supports. Lay out these dowel holes carefully so the shelves will be in contact with the dowels at all four points, and therefore lie flat.

The cabinet carcass should now be assembled. First glue up and clamp the sides, top, bottom, and stretcher. Next, drill out and counterbore for the 1- $\frac{1}{4}$  in. flathead wood screws, as shown in the screw detail. The stretcher is both glued in place and secured with several no. 4 finish nails on either side.

The  $\frac{1}{4}$  in. thick plywood back is set in a  $\frac{1}{4}$  in. deep by  $\frac{3}{8}$  in. wide rabbet

that is cut around the inside edge of the cabinet back using the router and a  $\frac{3}{8}$  in. piloted rabbeting bit. Square the corners of the rabbet with a chisel and then glue the back in place.

The door joinery is known as a mitered corner lap. For an in-depth review of how to make this type of joint, refer to *The Beginning Woodworker* column in the November/December 1980 issue (available as a back issue). The joints may either be cut by hand, using a fine-tooth backsaw, or with the table saw dado-head. The  $\frac{3}{8}$  in. square rabbet around the inner edge of the door frame is also cut with the dado-head. Dry fit the joints to insure a tight fit and then glue and clamp the door frame.

The door is sized to accept an 11 x 14 in. tin panel, available from The Sobys, P.O. Box 68, Claremont, CA 91711. Cost of the panel is \$6.00, post-paid.

To punch out the tin panel, first lay out the star pattern as shown in the illustration. A prick-punch or even an eight-penny nail will work fine as a punch. With an old piece of plywood under the tin as a backing, punch out the pattern, using one quick firm stroke of the hammer to make each hole. Space the holes about  $\frac{1}{4}$  in. apart. Mount the panel in the door frame and either glue or tack the  $\frac{3}{8}$  in. square retainer strips in place. Note that these strips are mitered at the corners.

Mortise out the door and side to accept the 1- $\frac{1}{2}$  in. hinges (L) as shown, then drill through the door stile to accept the mounting screw for the 1 in. porcelain knob (K). Both the hinges and knob should be available at your local hardware or building supply dealer.

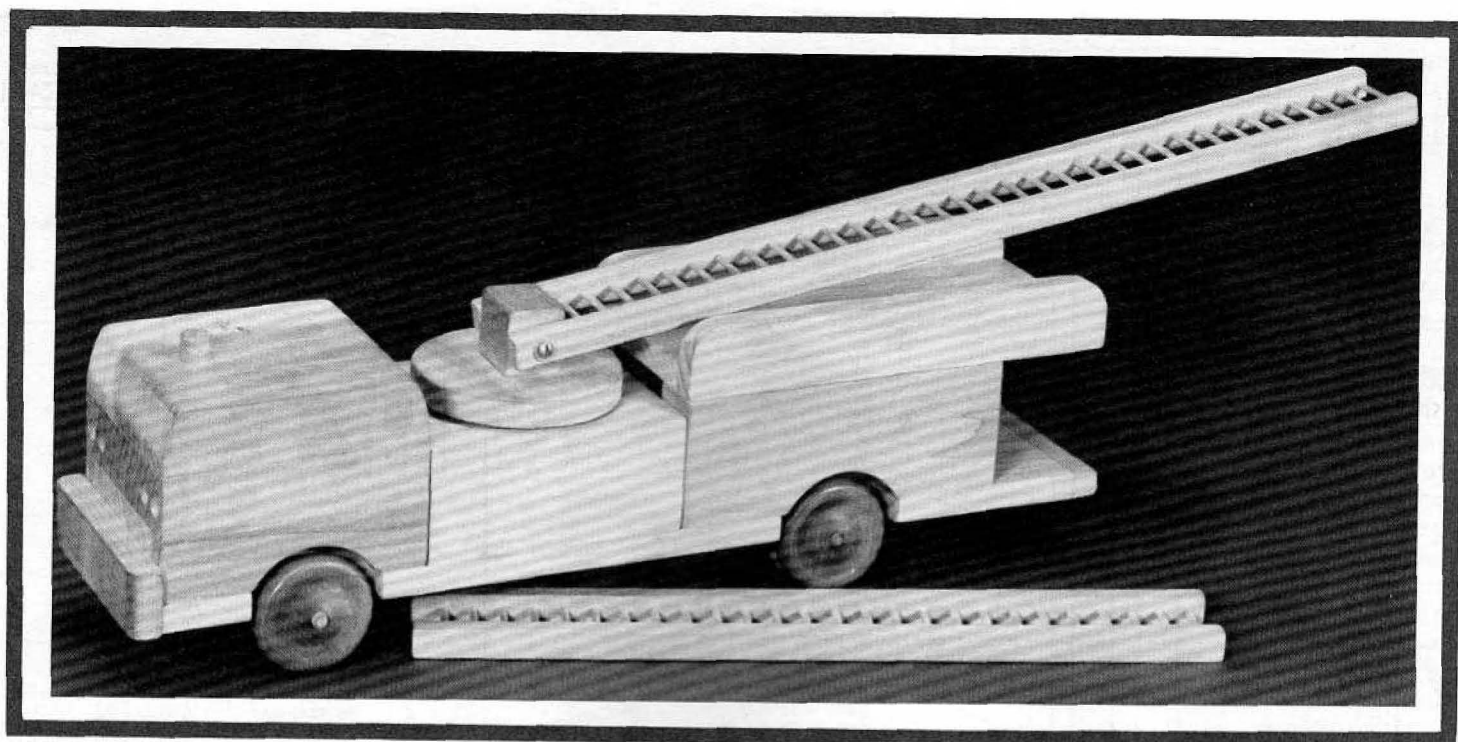
Final sand and then finish the cabinet as desired. Minwax Colonial Maple or Natural Pine are two stains that will look especially fine on this piece.

WJW

### Bill Of Materials (All Dimensions Actual)

Part	Description	Size	No. Req'd.
A	Side	$\frac{3}{4}$ x 7 $\frac{1}{4}$ x 17 $\frac{1}{2}$	2
B	Top	$\frac{3}{4}$ x 7 $\frac{7}{8}$ x 15 $\frac{3}{4}$	1
C	Bottom	$\frac{3}{4}$ x 7 $\frac{7}{8}$ x 15 $\frac{3}{4}$	1
D	Stretcher	$\frac{3}{4}$ x 1 $\frac{1}{2}$ x 14 $\frac{1}{2}$	1
E	Back	$\frac{1}{4}$ x 13 $\frac{3}{4}$ x 18 $\frac{1}{4}$	1
F	Door Rail	$\frac{3}{4}$ x 1 $\frac{3}{8}$ x 13	2
G	Door Stile	$\frac{3}{4}$ x 1 $\frac{3}{8}$ x 16	2
H	Tin	1/16 x 11 x 14	1
I	Retainer	$\frac{3}{8}$ x $\frac{3}{8}$	As Req'd.
J	Shelf	$\frac{3}{4}$ x 6 $\frac{1}{4}$ x 12 $\frac{3}{8}$	2
K	Knob	1 Dia.	1
L	Hinge	1 $\frac{1}{2}$ in.	2





## Toy Hook & Ladder Fire Truck

by C.J. Maginley

The  
Gift  
Shop

Following in our tradition of well-designed, durable toys is this hook and ladder fire truck. The swivel-mount ladder adds a touch of authenticity that children seem to enjoy.

Our fire truck was crafted from birch, although maple, cherry, or even pine would be a fine choice for this piece. The entire project may be built from five-quarter stock, which typically measures 1-1/16 in. thick for hardwood, 1-1/8 in. thick for pine.

You may begin by cutting to length and width parts C, D, E, H, and Q all of which are the same thickness. Chamfer the edges of part E with the disc or belt sander and drill out the top to accept the warning light (V). Drill four shallow holes into the front of part

D to serve as headlights.

The wheel wells in parts C and H are best cut with a hole saw. You will need to temporarily clamp a piece of scrap stock to each of the parts in order to provide a cutting surface for the hole saw pilot drill. Using a 2½ in. diameter hole saw, locate the center point so the cutaway portion of the parts will be ½ in. high by 2¼ in. across. Saw to a depth of ½ in. on part C, and completely through the stock on part H. Use a chisel to clean out the waste on part C and sand the back of the wheel wells to remove any splinters.

Next, resaw sufficient stock for parts A, B, F, G, I, J, K, L and R — all of which are ½ in. thick. Cut out the round ladder swivel (R) with the saber saw, and cut the remaining ½ in. thick parts to their indicated length and width. Round over the front bumper (L) and bed rails (J) as shown, and use the saber saw to cut the wheel recesses in part A. Drill ¾ in. diameter matching holes into parts G and R to accept the ¾ in. pivot hinge (S). The pivot hinge is available from: Constantine, 2050 Eastchester Road, Bronx, NY 10461. Order part number ROT34.

For the front and rear axle mounts (parts M and N) resaw five-quarter stock to ¾ in. thick (or purchase ¾ in. thick stock), and then cut both parts to length and width. Chamfer the bottom edges of the axle mounts as shown and, using the table saw dado-head, cut the 5/16 in. by 5/16 in. axle grooves.

The ladders (T and U) are made by resawing five-quarter stock into lengths ¾ in. square. Cut sufficient sections of ½ in. diameter by 1¼ in.

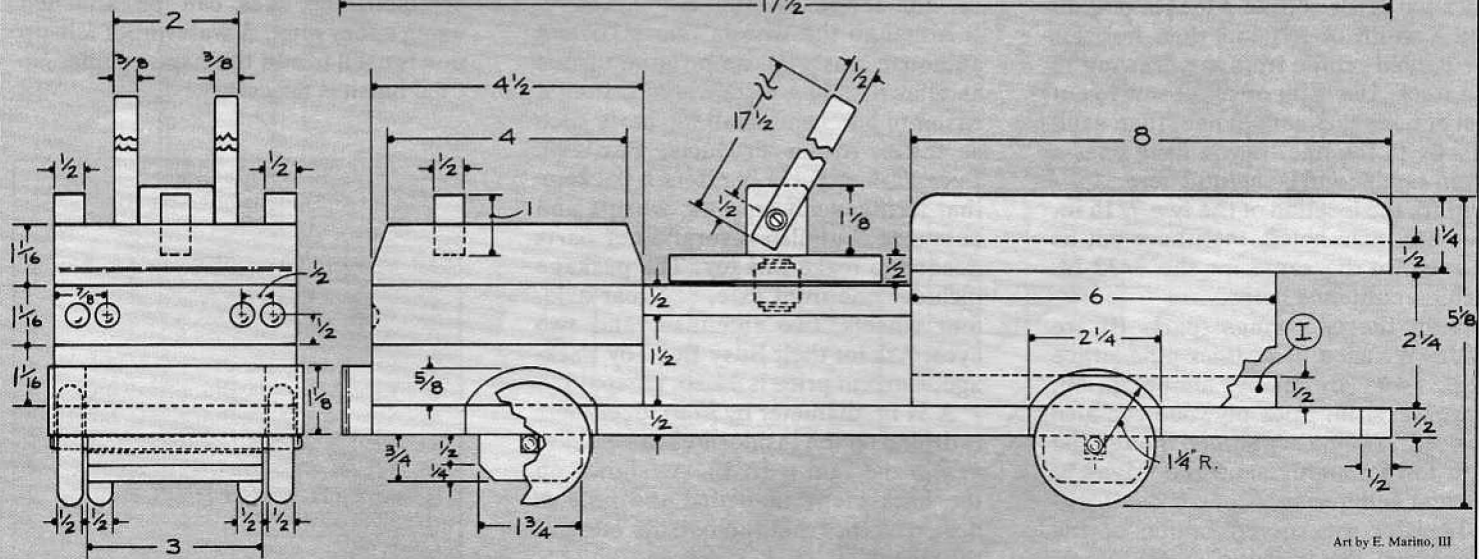
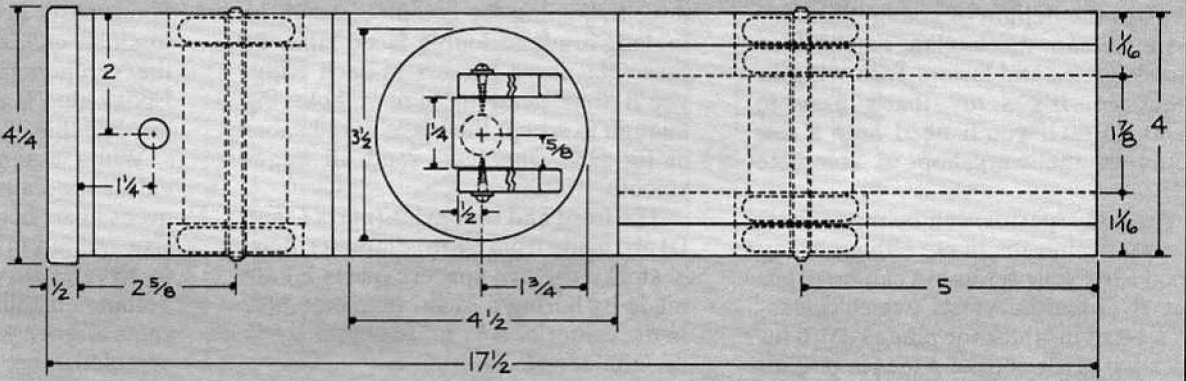
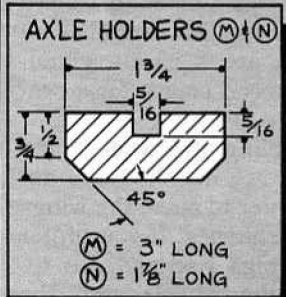
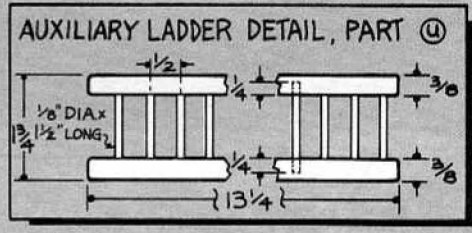
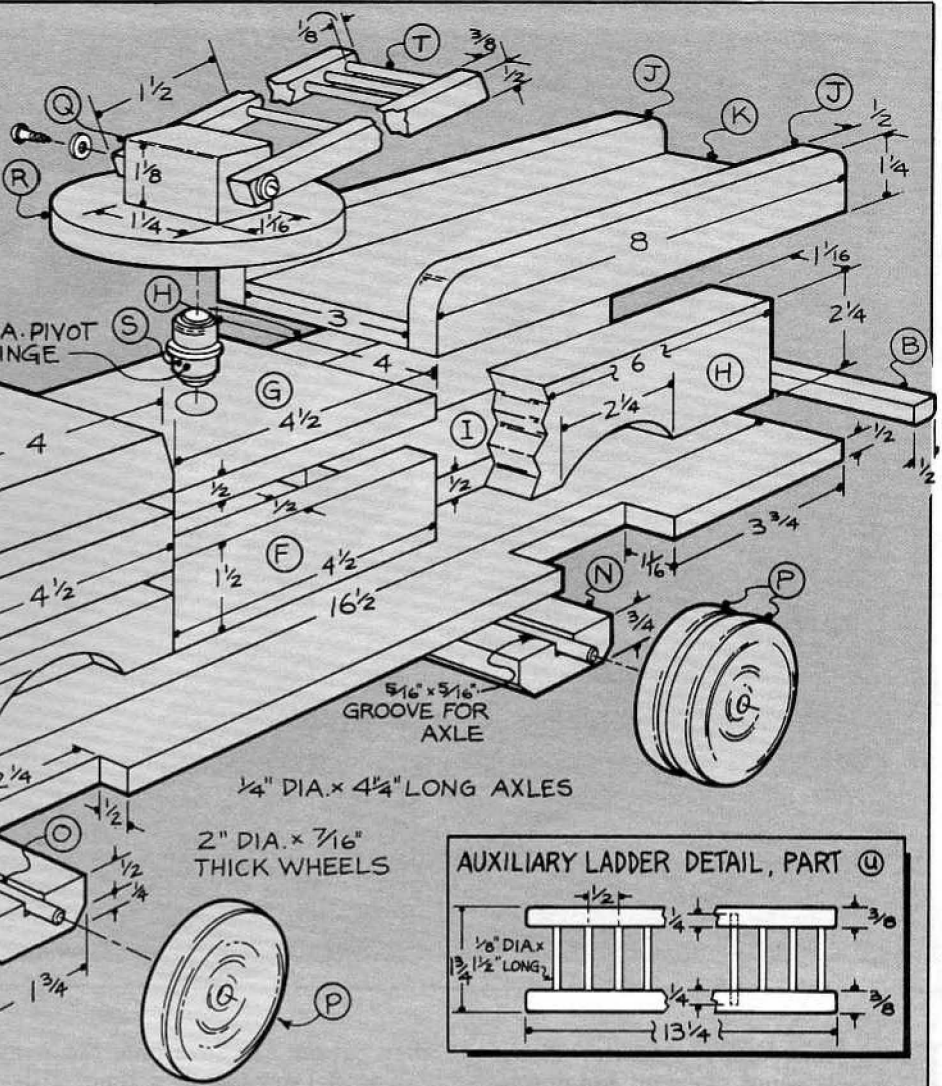
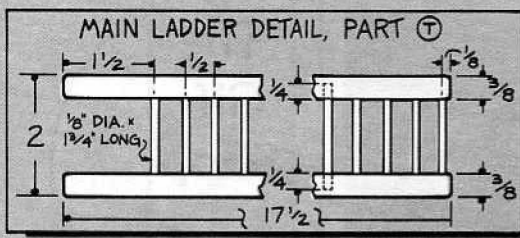
long dowel stock, then drill out the ladder rails to accept these rungs. Use glue to join the rungs and rails as shown.

Assemble the fire truck by carefully gluing and clamping all parts. The pivot hinge is glued in place and the ladder is screwed to the ladder mount with two round-head wood screws as shown. Drill out the ladder ends to accommodate the screw shank diameter so the ladder can be easily raised and lowered. The wheels may be turned on a lathe or, if you prefer, purchased from: The Toymaker Supply Company, 2907 Lake Forest Road, P.O. Box 5459, Tahoe City, CA 95730.

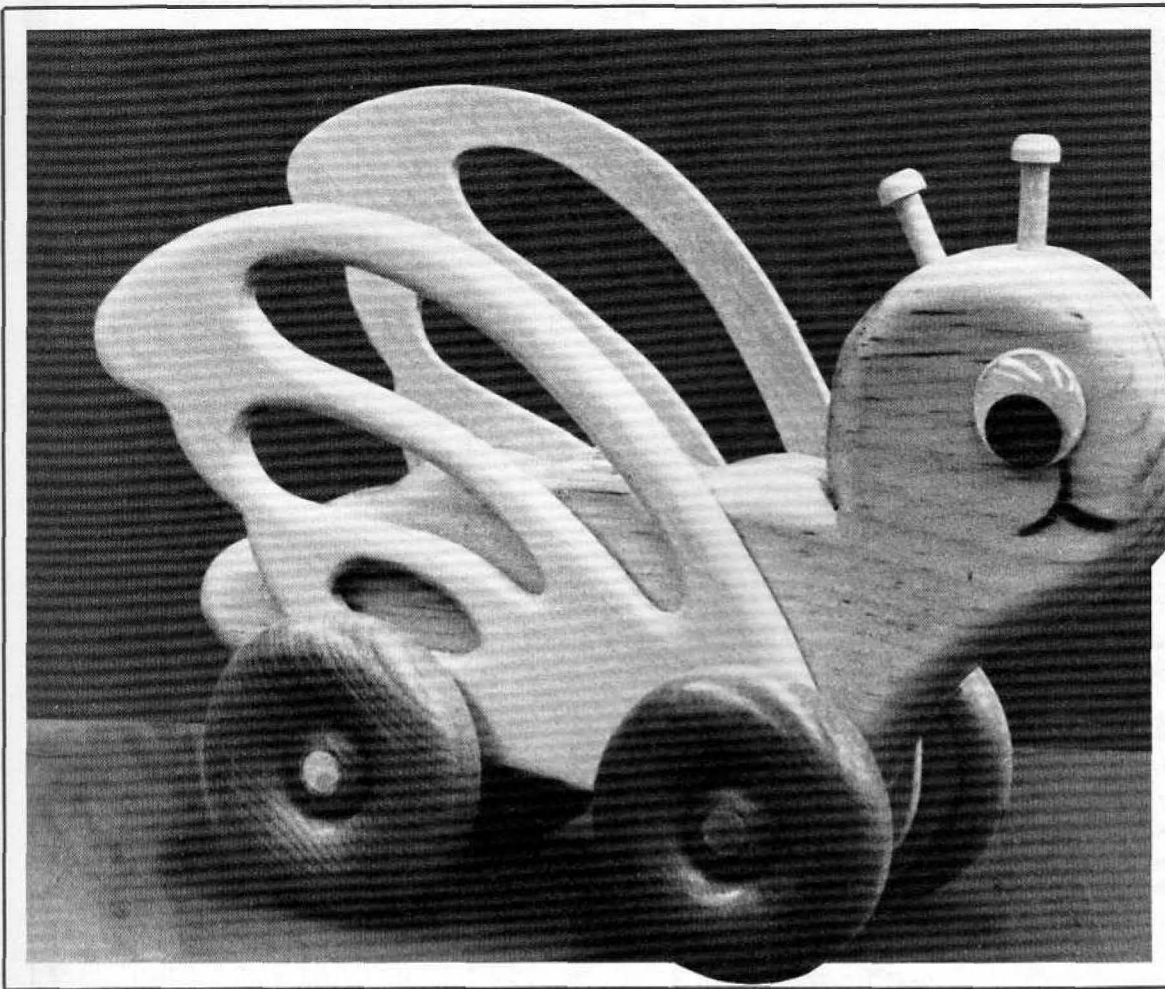
Because this is a toy for toddlers or pre-school age children, we recommend only a fine sanding, with no additional finish. Wwj

Bill Of Materials  
(All Dimensions Actual)

Part	Description	Size	No. Req'd.
A	Undercarriage	½ x 4 x 16½	1
B	Back Bumper	½ x ½ x 4	1
C	Lower Cab	1-1/16 x 4 x 4½	1
D	Center Cab	1-1/16 x 4 x 4½	1
E	Upper Cab	1-1/16 x 4 x 4½	1
F	Center Panel	½ x 1½ x 4½	2
G	Ladder Base	½ x 4 x 4½	1
H	Back Panel	1-1/16 x 2¼ x 6	2
I	Inner Block	½ x 1½ x 6	1
J	Bed Rails	½ x 1¼ x 8	2
K	Bed	½ x 3 x 8	1
L	Front Bumper	½ x 1½ x 4¼	1
M	Front Axle Mount	¾ x 1¼ x 3	1
N	Rear Axle Mount	¾ x 1¼ x 1½	1
O	Axle	¼ Dia. x 4¼ Long	2
P	Wheel	2 Dia. x 7/16 Thick	6
Q	Ladder Mount	1-1/16 x 1-1/16 x 1¼	1
R	Ladder Swivel	3½ Dia. x ½ Thick	1
S	Pivot-Hinge	¾	1
T	Main Ladder	See Detail	1
U	Auxiliary Ladder	See Detail	1
V	Warning Light	½ Dia. x 1 Long	1



## The Gift Shop



## Busy Bee Toy

**P**ush this happy character along and its wings move up and down, much to the delight of young children. A simple cam mechanism on the rear wheels raises and lowers each wing in sequence. It's a toy that's easy to build; in fact, you'll need only a few hours in the workshop to complete one.

The body (part A) can be made first. We used pine for ours, although any wood from your scrap bin can be used. Cut five-quarter stock (which measures 1-1/8 in. thick for pine, 1-1/16 in. thick for hardwood) to a length of 9 in. and a width of 5 1/2 in., then transfer the curved profile from the drawing to the stock. Use a jig or saber saw to cut just outside the marked line, then sand exactly to the line. If you have one, a drum sander will be helpful here.

Mark the location of the two 7/16 in. diameter axle holes, then bore out as shown. Do the same for the 7/32 in. diameter antenna holes.

Next, the two wings (parts B) are made. We used 1/4 in. thick pine lattice stock (sold by many lumberyards), however 1/4 in. thick plywood can also be used. If you use plywood though, be sure to thoroughly sand the edges to prevent splintering.

Transfer the curved profile of the wing from the drawing to the stock

then cut out. To save time the wings can be cut out two at a time. This is done by joining the two pieces with 1/2 in. long brads or double-faced tape. To make the three cutouts in each wing, you'll first need to bore a hole big enough to accept the blade of the saber or jig saw. Once cut, sand all edges smooth.

The front and rear axles (parts C and D) are made from 3/8 in. diameter dowel stock. The two spacers (parts E) are made by boring a 3/8 in. diameter hole in the center of a 1/2 in. diameter by 3/8 in. long dowel.

Although the wheels (parts G) and antennae (parts H) can be lathe turned as shown, many woodworkers find it easier to purchase small toy parts such as these. Armor Products, Box 290, Deer Park, NY 11729 offers a package that includes not only the wheels and antennae, but also several other parts needed to make this toy. The package includes one front axle, one rear axle, four wheels, two antennae, and two eyes. Ask for their Busy Bee Toy Package. Current price is \$4.50, postpaid.

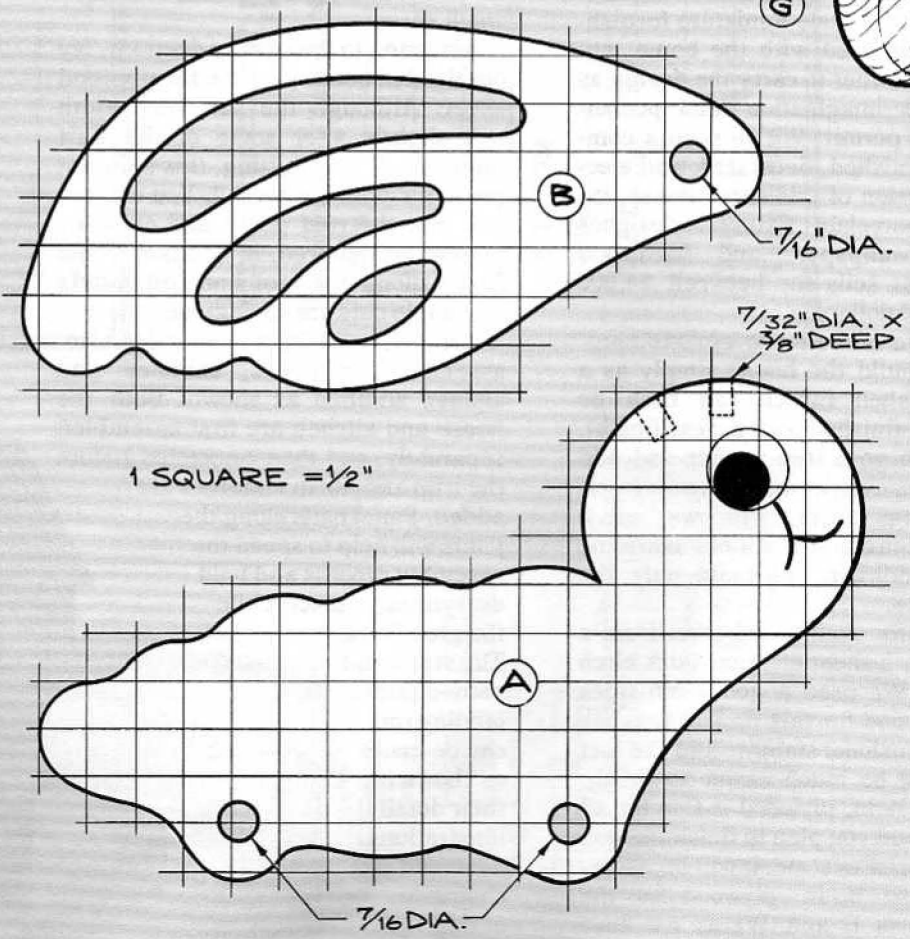
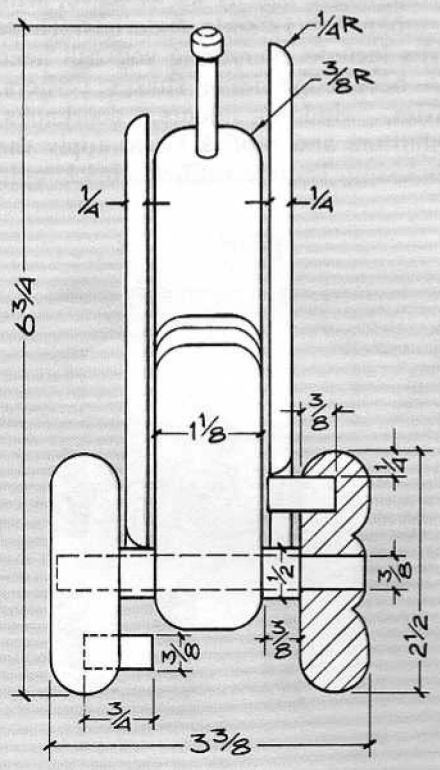
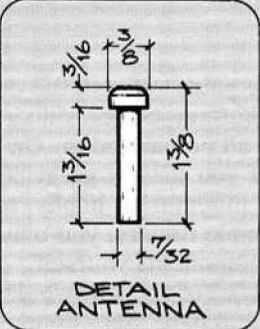
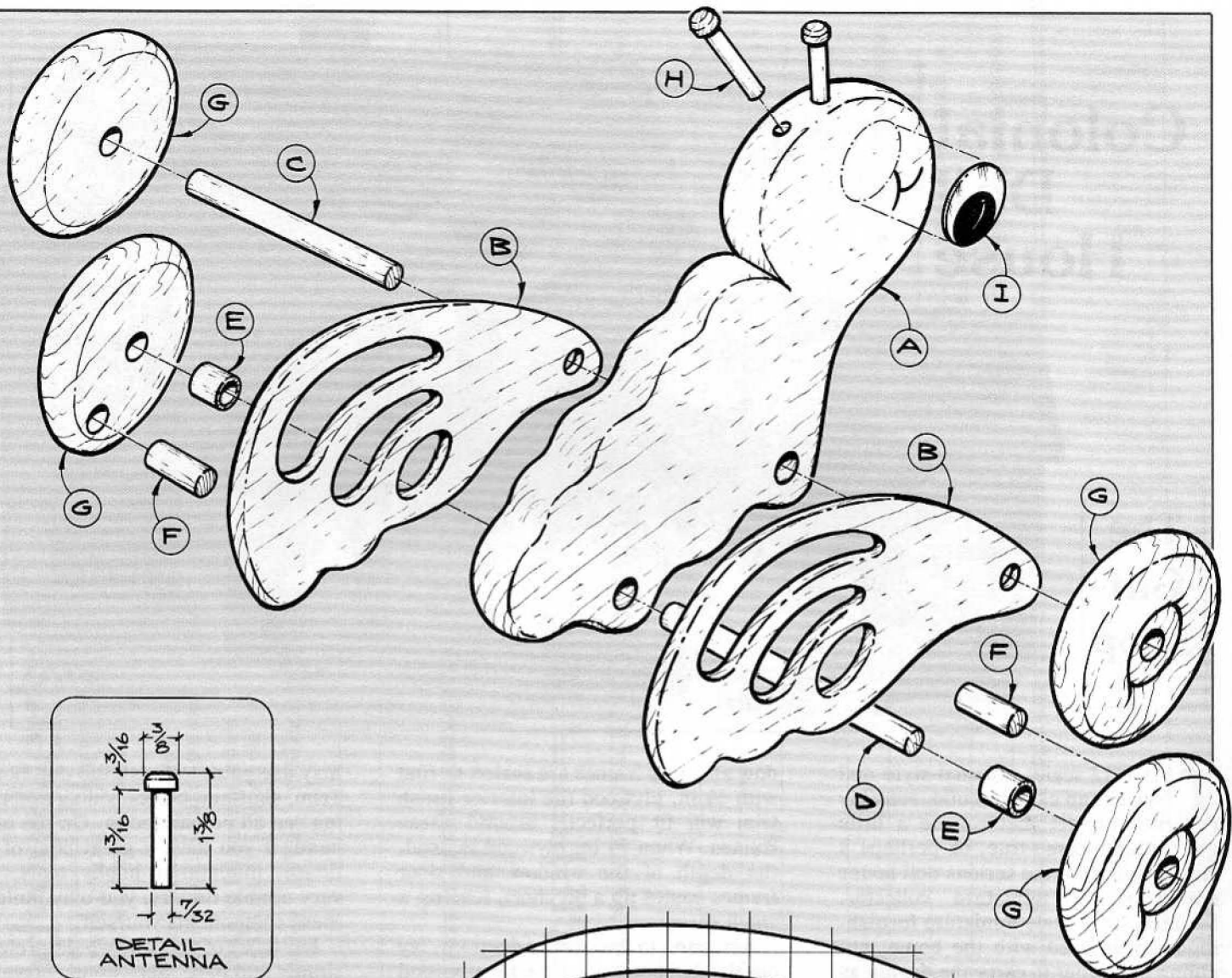
A 3/8 in. diameter by 3/8 in. deep hole is drilled on the inside of each wheel to accept the cam (part F). As shown on the back view, note that the hole is drilled 1/4 in. from the outside edge of the wheel

Give the body, wings, and wheels a good sanding before final assembly. Small parts present a choking hazard to small children, so be sure that all the components are securely glued. Epoxy glue is a good choice for a project like this.

When assembling the wheels and axles, the cams are installed 180 degrees apart in order to make the wings rise and fall in sequence. If you prefer to have both wings rise and fall together, install the wheels with the cams aligned with each other. Once assembled, the eyes can be attached using epoxy glue. A waterproof felt-tip pen is used to add the happy smile. No final finish is necessary. WJ

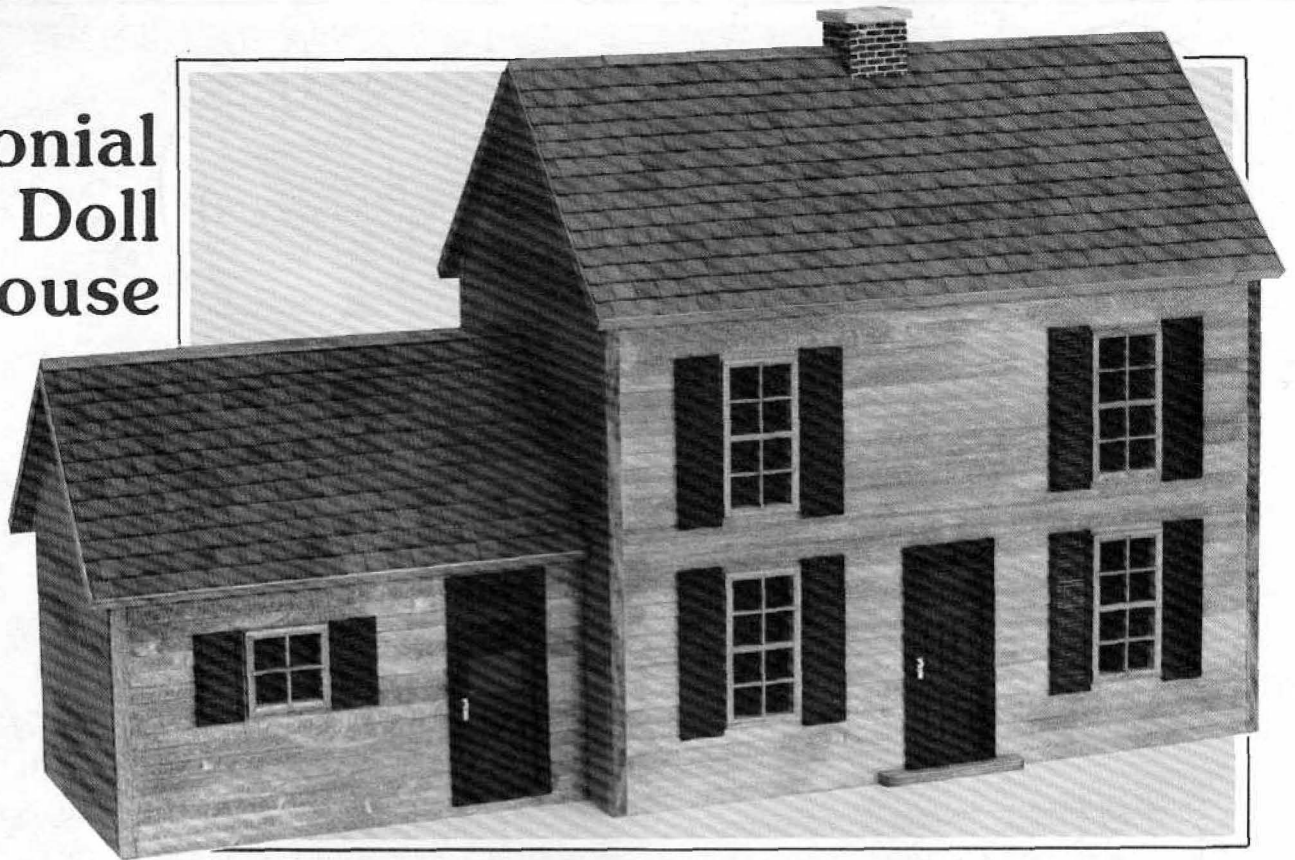
### Bill Of Materials (All Dimensions Actual)

Part	Description	Size	No. Req'd.
A	Body	1 1/8 x 5 1/2 x 9	1
B	Wing	1/4 x 4 x 8	2
C	Front Axle	3/8 Dia. x 3-3/16 Long	1
D	Rear Axle	3/8 Dia. x 3 3/8 Long	1
E	Spacer	1/2 Dia. x 3/8 Long	2
F	Cam	3/8 Dia. x 3/4 Long	2
G	Wheel	2 1/2 Dia. x 3/4 Thick	4
H	Antenna	(see detail)	2
I	Eye		2



# Colonial Doll House

The  
Gift  
Shop



This 1/12 scale, Colonial-style doll house is an easy-to-build, sensibly designed project that can be a little girl's dream-come-true, or perhaps a starter house for the serious doll house enthusiast or miniature collector. Standard 1/12 scale miniature furnishings can be used with the home, enabling the owner to carry the design as far as his imagination (and pocket-book) will permit. We've seen a completely furnished, decorated, and electrified version of this same house, including porcelain fixtures, designer fabrics, wallpaper, and hardwood floors, that sells for between \$4,000 and \$5,000 dollars.

We have offered two options here. You can build the house simply as a plywood shell (which can then be painted or finished with a clear finish), or you can go a step further and add the various exterior components (roofing, siding, doors, windows, etc.). Also, if desired, you can eliminate the kitchen addition and build only the main house.

The entire shell may be cut from a single 4 by 8 sheet of  $\frac{3}{8}$  in. thick birch plywood. We used a good-both-sides birch plywood for this project because of its dimensional stability and the fact that it will be much easier to finish. Although  $\frac{3}{8}$  in. plywood is fine for all parts, should you plan to finish the doll house interior to scale, it will be necessary to use  $\frac{1}{4}$  in. plywood for the fronts (parts E and W) as we have done. This is because the pre-cut win-

dow and door frames are scaled so that with  $\frac{1}{4}$  in. plywood the interior finish trim will fit perfectly around these frames. When  $\frac{3}{8}$  in. plywood is used, the depth of the window and door frames comes up a bit short, leaving a small space.

Referring to the cutting diagram, lay out the doll house parts on the plywood sheet. Although the saw kerf width will slightly alter some of the part dimensions after cutting, this does not present a problem overall. You will notice that the roof peaks and chimney bottom are mitered, in addition to the fronts along the roof line. All miters and angle cuts are 45 degrees.

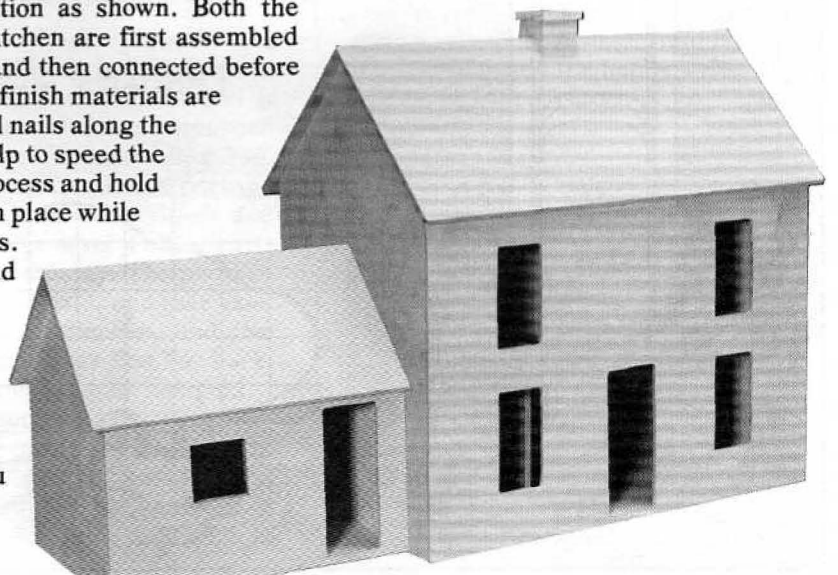
After all parts have been cut to size, assemble the house, chimney and kitchen addition as shown. Both the house and kitchen are first assembled separately, and then connected before the trim and finish materials are added. Panel nails along the joints will help to speed the assembly process and hold everything in place while the glue dries.

The stairs and second floor landing rail can be made as shown in their detail illustrations.

Should you choose to, at this point you

may use paint to finish the doll house. Trim, shutters, bricks, siding and roofing can all be painted in. On the other hand, if you have a great deal of patience, miniaturist hobby tools, and very nimble fingers, you may build all these components yourself.

For those of you who would prefer to simply purchase these items, however, we have arranged with a supplier to offer complete kits so you may finish your house exactly as we have, with authentic 1/12 scale materials. These kits include everything you will need — bevel-edge siding, shakes, corners, trim, windows, doors, doorknobs, shutters and a brick kit to apply the bricking. There is sufficient bricking in



the kit to also brick over a 1 by 2 foundation around the doll house perimeter, should you decide to add this feature.

The kits are available from: The Wooden Toy, 166 Rt. 44, P.O. Box 71, Canton, CT 06019. The complete doll house kit (part number KIT-82) is priced at \$100. The house without the kitchen addition (part number KIT-81) is priced at \$80. The kits do *not* include the plywood, hinges, stairs and railing.

Finishing the doll house with the kit materials should take between 14 and 18 hours. Starting with the roof, brick over and install the chimney first. A length of siding, wide edge down, serves as a starter strip under the first course of shingles. As shown in the illustration the shingles are laid  $\frac{3}{4}$  in. to-the-weather, and the roof cap is in-

stalled *over* the last course. Both the shingles and cap butt to the chimney. Add the fascia around the roof perimeter. Tacky glue (available at most hobby stores) or a hot glue gun is recommended for all siding and trim materials.

Install the corners next. Note that there is a square inside corner on the front where the house and kitchen meet. The siding is *not* overlapped — it is simply stacked edge-to-edge. Install the siding with the wide edge down, and butt it up to (not under) the corners. The windows, doors, and shutters are then fitted *over* the siding.

Stain and paint the doll house to taste and use your imagination to decorate the interior. Scraps of wallpaper and fabrics are especially useful, and they cost nothing. Wwf

Bill Of Materials  
(All Dimensions Actual)

Main House			No.
Part	Description	Size	Req'd.
A	First Floor	$\frac{3}{4}$ x 14 x 24	1
B	Side	$\frac{3}{4}$ x 14 x 24	2
C	Second Floor	$\frac{3}{4}$ x 14 x 24	1
D	Third Floor	$\frac{3}{4}$ x 14 x 24	1
E	Front	$\frac{3}{4}$ x 17 x 24 $\frac{1}{4}$	1
F	First Floor Wall	$\frac{3}{4}$ x 8 x 14	1
G	Second Floor Wall	$\frac{3}{4}$ x 7 $\frac{1}{4}$ x 14	1
H	Third Floor Wall	$\frac{3}{4}$ x 7 x 10	1
I	Front Roof	$\frac{3}{4}$ x 11 $\frac{1}{4}$ x 25 $\frac{3}{4}$	1
J	Lower Back Roof	$\frac{3}{4}$ x 7 $\frac{1}{4}$ x 25 $\frac{3}{4}$	1
K	Upper Back Roof	$\frac{3}{4}$ x 3 $\frac{3}{4}$ x 25 $\frac{3}{4}$	1
L	Hinge	1 in.	4*
M	Staircase	(See Detail)	1
N	Treadboard	$\frac{3}{4}$ x $\frac{3}{4}$ x 2 $\frac{1}{8}$	12
O	Railing	(See Detail)	1
P	Chimney End	$\frac{3}{4}$ x 2 $\frac{1}{4}$ x 1 $\frac{1}{2}$	2
Q	Chimney Side	$\frac{3}{4}$ x 2 $\frac{1}{4}$ x 2 $\frac{1}{4}$	2
R	Chimney Cap	$\frac{3}{4}$ x $\frac{1}{2}$	As Req'd.
S	Front Step	$\frac{3}{4}$ x $\frac{3}{4}$ x 5 $\frac{1}{2}$	1

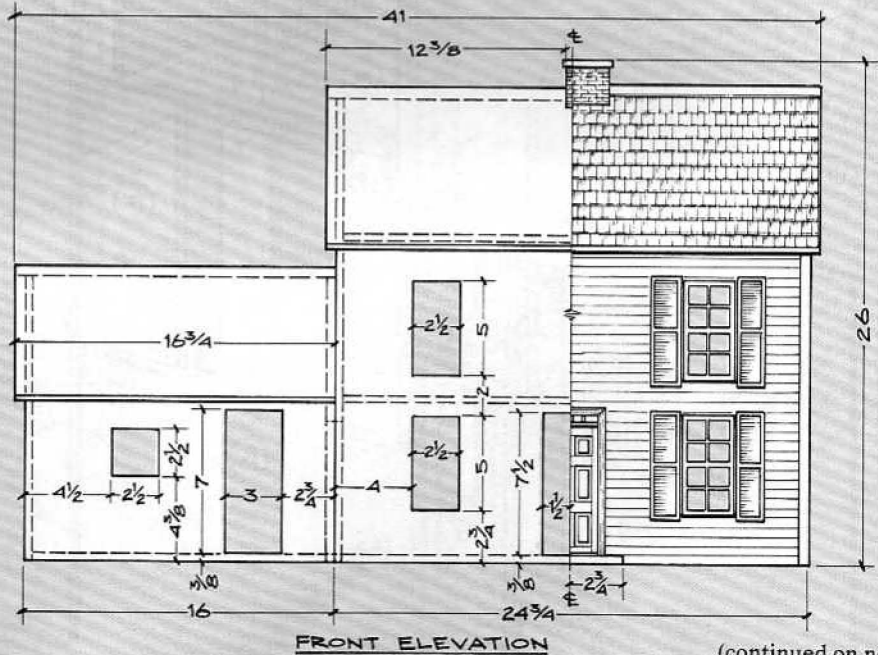
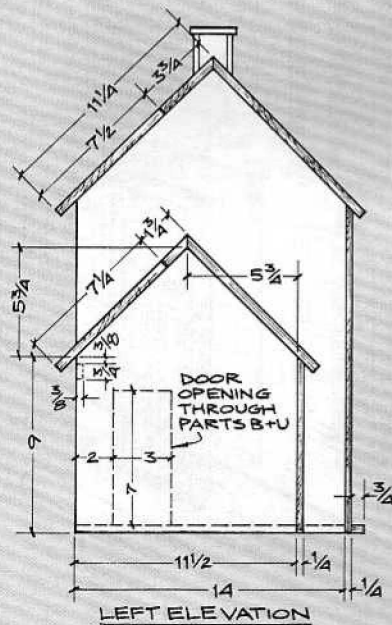
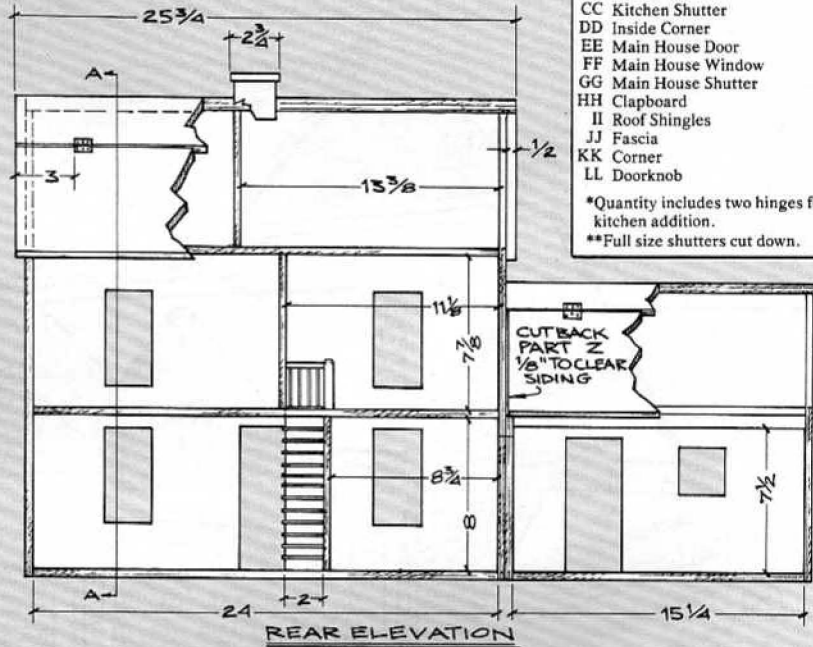
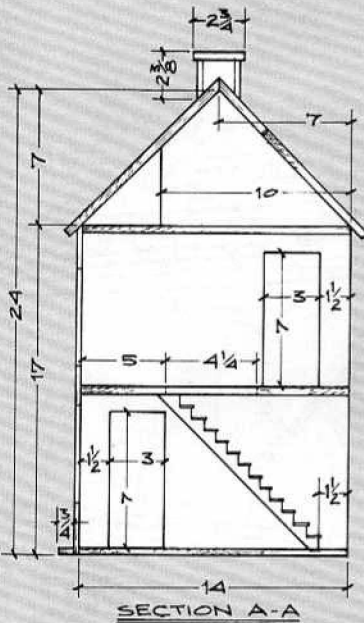
Kitchen Addition

T	Floor	$\frac{3}{4}$ x 11 $\frac{1}{2}$ x 15 $\frac{1}{4}$	1
U	Side	$\frac{3}{4}$ x 11 $\frac{1}{2}$ x 14 $\frac{3}{4}$	2
V	Support	$\frac{3}{4}$ x $\frac{3}{4}$ x 15 $\frac{1}{4}$	1
W	Front	$\frac{1}{4}$ x 9 x 16	1
X	Front Roof	$\frac{3}{4}$ x 9 x 16 $\frac{1}{4}$	1
Y	Upper Back Roof	$\frac{3}{4}$ x 1 $\frac{3}{4}$ x 16 $\frac{1}{4}$	1
Z	Lower Back Roof	$\frac{3}{4}$ x 7 $\frac{1}{4}$ x 16 $\frac{1}{4}$	1

Accessories

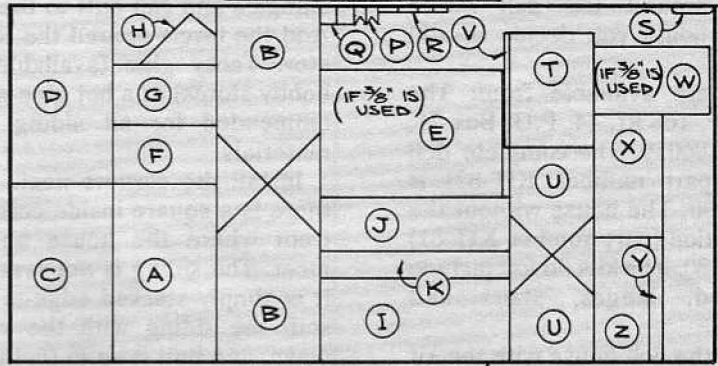
AA	Kitchen Front Door	1
BB	Kitchen Window	1
CC	Kitchen Shutter	1 Pair**
DD	Inside Corner	1
EE	Main House Door	1
FF	Main House Window	4
GG	Main House Shutter	4 Pair
HH	Clapboard	As Req'd.
II	Roof Shingles	As Req'd.
JJ	Fascia	As Req'd.
KK	Corner	As Req'd.
LL	Doorknob	2

\*Quantity includes two hinges for kitchen addition.  
\*\*Full size shutters cut down.

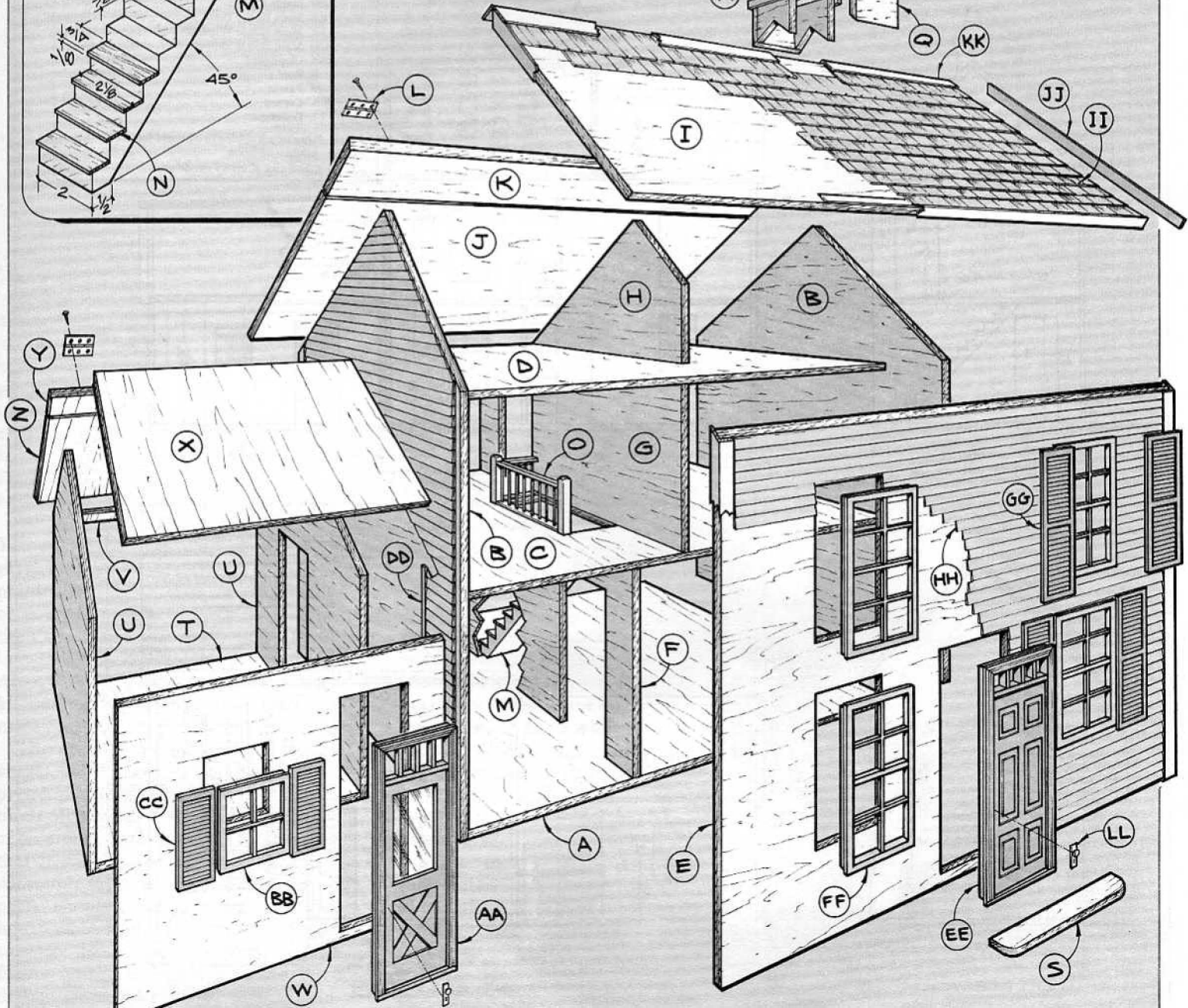
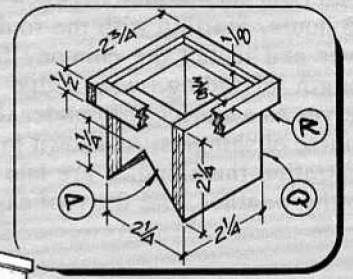
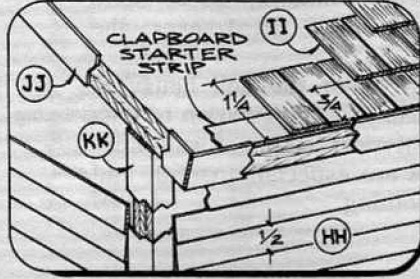
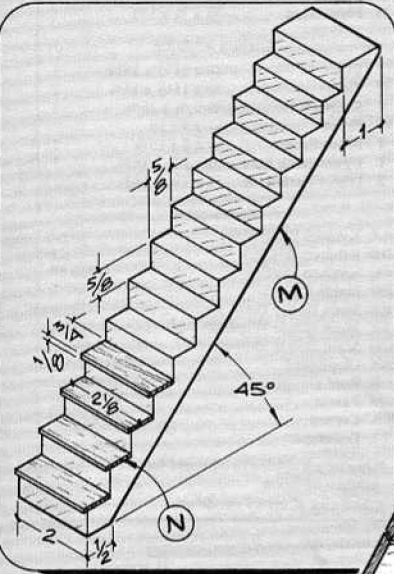
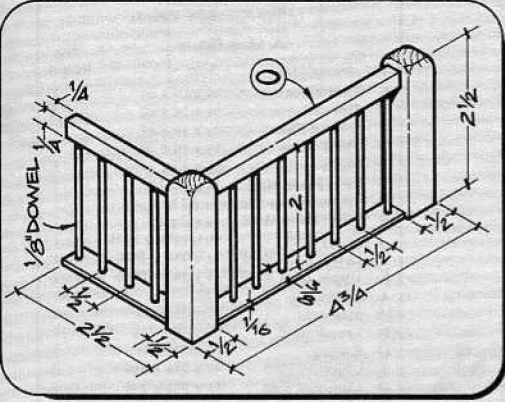


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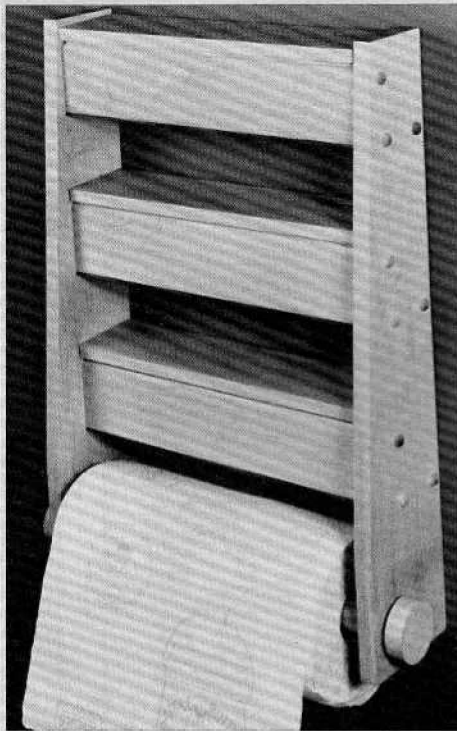
CUTTING DIAGRAM



4x8' 3/8" PLYWOOD



# Kitchen Organizer



**Bill of Materials**  
(All Dimensions Actual)

Part	Description	Size	No. Req'd.
A	Side	3/4 x 4 1/4 x 20	2
B	Bottom	3/4 x 2 1/8 x 12 1/2	3
C	Front	3/4 x 2 3/4 x 12 1/2	3
D	Edging	1/2 x 1/4 x 12 1/2	3
E	Lid	1/2 x 3 x 12 1/2	3
F	Blade Retainer	7/32 x 3/8 x 12 1/2	3
G	Hack Saw Blade	12 Long x 18 tpi	3
H	Back Strip	1/4 x 1/4 x 13	3
I	Spindle	1 1/4 Dia. x 14 1/4	1
J	Cap	2 Dia. x 3/4 Thick	2
K	Flathead Wood Screw	1 1/4 x No. 8	18
L	Wood Button	3/8	18
M	Hanger	1 1/2 Long	2

Those rolls of wax paper, aluminum foil, plastic wrap, and paper towels, can all be neatly organized in this attractive wall-hung storage system. We used maple for ours, but any wood, even pine, can be used.

Begin by cutting the two sides (A) to overall length and width shown in the bill of materials. Note that, at a point 4 in. from the bottom, the front edge tapers to 3 in. at the top. This taper can be cut on the table saw with a tapering jig, or by laying out the taper and cutting just outside the marked line with a saber saw. A smooth plane can then be used to plane the edge exactly to the line.

Next, lay out and mark the center point of the 1 3/8 in. diameter spindle hole in the side. Bore the hole with a 1 3/8 in. spade bit, taking care to back-

up the hole with a piece of scrap stock to prevent splintering.

Cut the bottoms (B) and fronts (C) to width and length. Note that the fronts have a 1/4 in. wide by 3/8 in. deep groove cut in the top edge. This groove can be cut on the table saw, either by making a single pass with the dado-head cutter, or by making two or three passes with a regular saw blade. Use sandpaper to apply the 1/8 in. radius to each side of the groove.

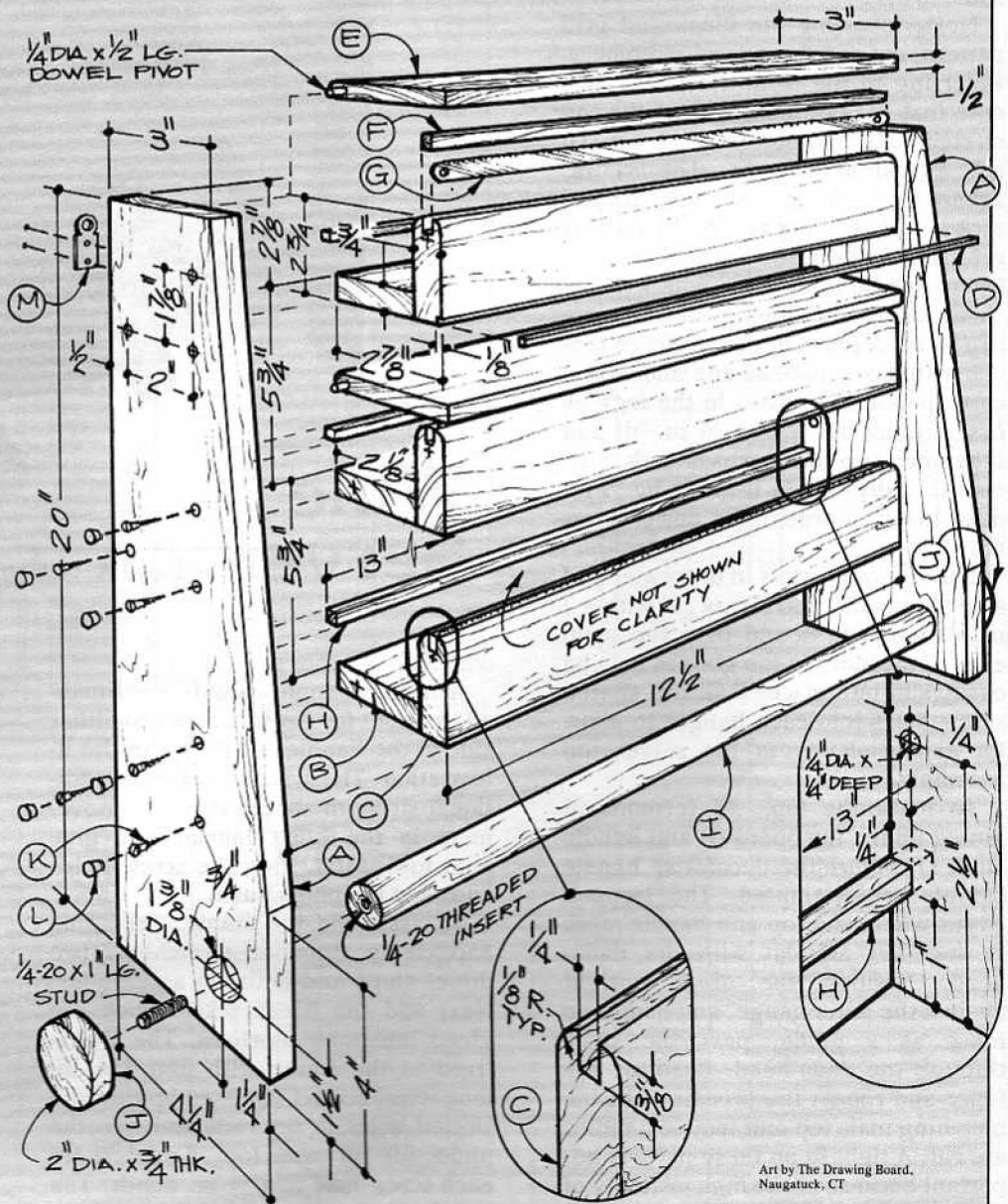
Glue and clamp parts B and C as shown, then use the dado-head to cut a 1/8 in. by 1/8 in. rabbet along the front corner to accept the decorative edging (D). Select a wood of contrasting color (we used walnut) for the edging, then rip it to 3/16 in. square by 13 in. long strips. Glue each strip in place, then clamp securely. When dry, plane the edging flush to part C before trimming to the 12 1/2 in. length.

A standard 12 in. long hack saw

blade (with 18 teeth per in.) serves as the cutter. Cut the blade retainer (F) to size, then glue it in place along with the hack saw blade. About 1/8 in. of the blade should be exposed and it should fit tightly in place so that no movement will occur.

Assemble the remaining parts as shown. On one end of the spindle (I), the cap (J) is permanently secured with a 1/2 in. diameter blind dowel. On the other end, a threaded insert is added. The cap on the threaded insert end is bored to accept a 1 in. long stud. The stud is made by simply cutting the head off a 1/4 - 20 bolt. Epoxy glue is used to join the stud to the cap.

Final sand before finishing with a good quality penetrating oil. Remove the rolls of wax paper, aluminum foil, and plastic wrap from their boxes before placing in the compartments. Tear off each sheet with a sharp downward snap. Wwj



This portable wine server is perfect for storing several choice bottles of wine, together with stemware. Our server was crafted of walnut, and features an especially attractive top of red narra, a species of padauk.

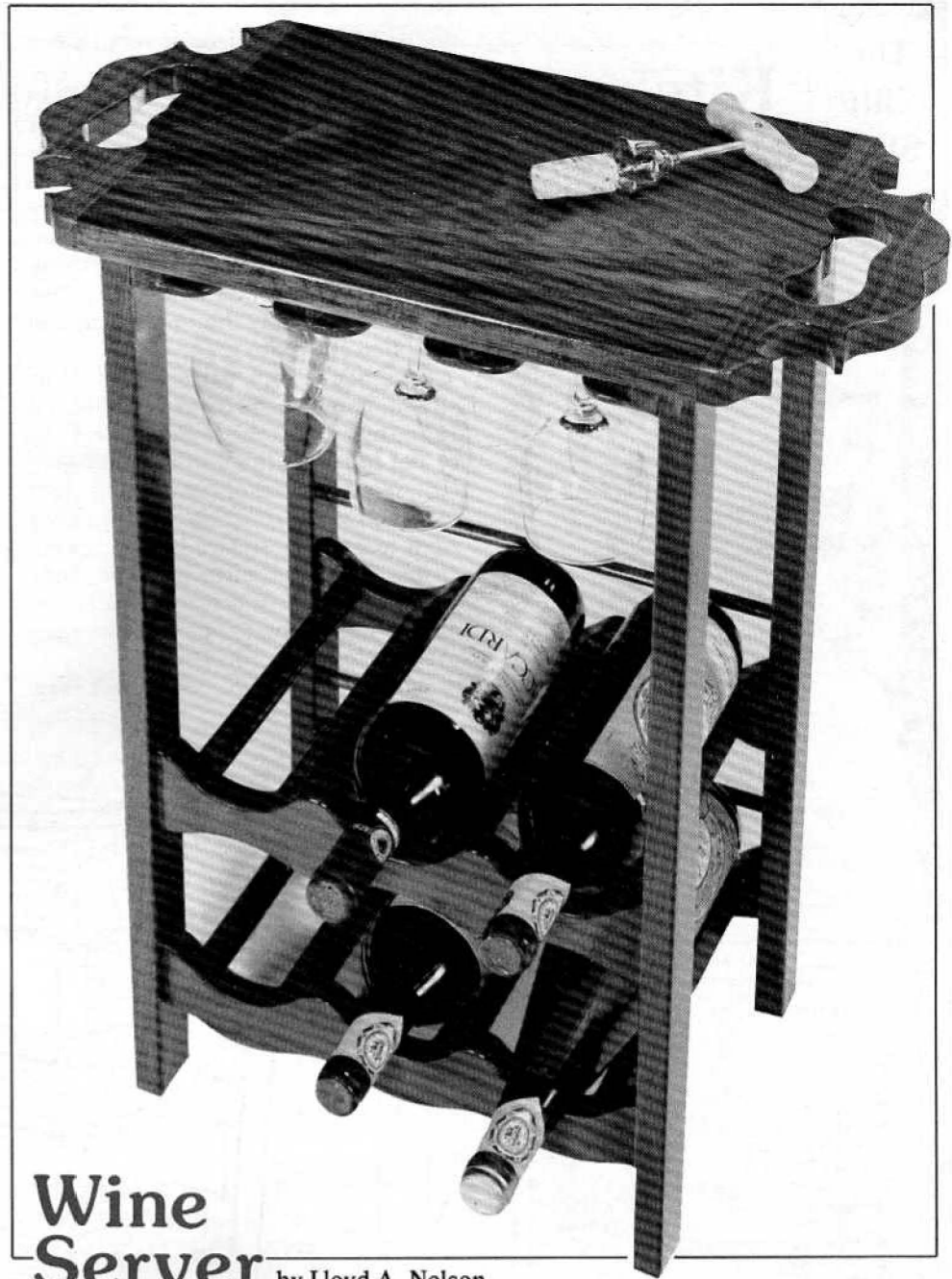
In part, the success of this piece depends on the selection of a distinctive section of wood for the top. A finely figured board will be highlighted when viewed in the context of a more uniformly grained base. For best results, we suggest using two woods that compliment, rather than contrast, each other.

The server may be built entirely from  $\frac{3}{4}$  in. thick boards. You may begin by cutting to length and width the legs (A), rails (B), stretchers (C and D), racks (E), center and side hangers (G and H), top (I) and handles (J). With the table saw dado-head, cut the slip-joint mortises and tenons on parts A and B. Glue and clamp both leg and rail assemblies and set them aside to dry.

Next, following the illustrated grid pattern, cut out the curved stretchers. Referring to the front view, you will note that the bottom edges of the top stretcher (C) and bottom stretcher (D) are a male-female fit. The  $\frac{3}{4}$  in. square by  $\frac{1}{4}$  in. deep mortises for the rack pieces (E) may also be located by referring to the grid. Cut the mortises by scoring on three sides with a  $\frac{3}{4}$  in. chisel and then chopping out the waste to a  $\frac{1}{4}$  in. depth. Cut the stretcher tenons with the dado-head and make their corresponding mortises in the legs by first drilling out with a  $\frac{1}{4}$  in. bit and then squaring the mortises with chisels. Also, drill the  $\frac{3}{8}$  in. wide by  $\frac{1}{2}$  in. deep holes to accept the dowel stops (F).

The stemware slots in the center and side hangers (G and H) are cut with a 7 in. dado-head. Round over the open ends of the slots so the glasses may be easily slid into place. Drill two slotted screw holes into each hanger to allow for expansion across the server top assembly.

To make the top, we recommend gluing up the top board (I) and handle stock (J) *before* the decorative handle cutouts are attempted. The stepped edges where the top and handle stock fit together are cut with the dado-head. Position the stock upright against the miter gauge, and using the fence as a guide, pass the stock through the dado-head. Readjust the fence and repeat the process until the matching male top and female handles are cut. A tight fit on these parts is important because of the high visibility of the top. Transfer the illustrated handle grid pattern and complete the cutouts



**Wine Server** by Lloyd A. Nelson

with a jig or saber saw.

After the handle cutouts are finished, drill out for  $1\frac{1}{2}$  in. screws on either side of the handles as shown in the illustration. These screws provide additional strength should there be movement in the wood causing the glue joint to weaken. Plug the screw holes and sand the plugs flush.

To assemble the frame, first glue and clamp the four stretchers, two dowel stops and both leg assemblies. Next add the wine racks, which are glued into their mortises. The top is fixed to the frame with four  $1\frac{1}{4}$  in. long wood screws fastened up through slotted holes in the rails and into the underside of the top. Counterbore each screw hole to a  $\frac{1}{4}$  in. depth. The stemware hangers are screwed in place using  $1\frac{1}{4}$  in. flathead wood

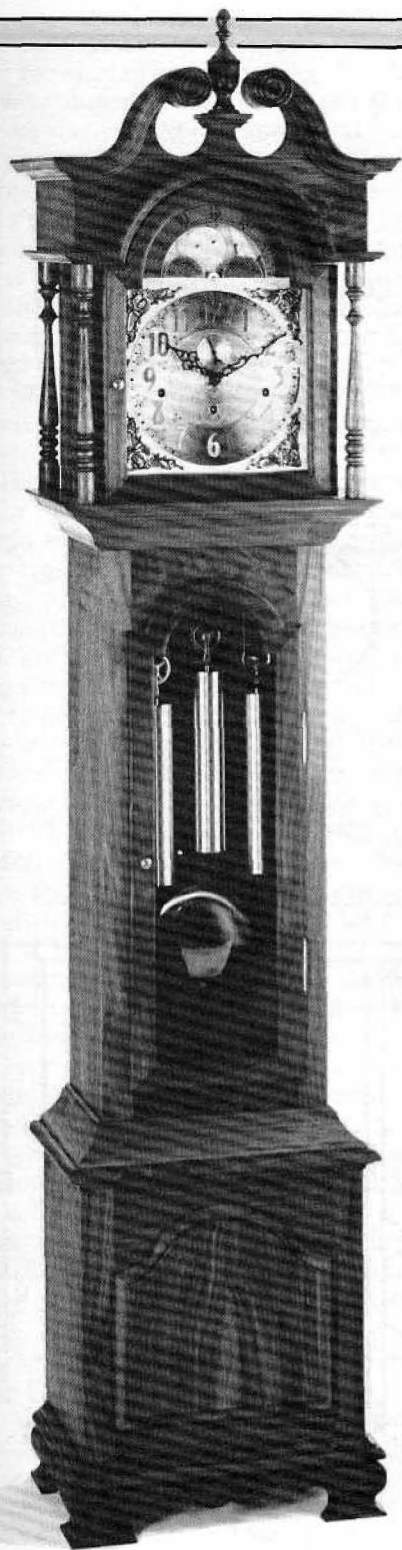
screws.

Sand the server and finish as desired. Keep in mind however that a waterproof penetrating oil or polyurethane will protect the wood from spills and stains. W&J

Bill Of Materials  
(All Dimensions Actual)

Part	Description	Size	No. Req'd.
A	Leg	$\frac{3}{4}$ x $1\frac{1}{2}$ x $23\frac{1}{4}$	4
B	Rail	$\frac{3}{4}$ x $1\frac{1}{2}$ x $9\frac{3}{4}$	2
C	Top Stretcher	See Detail	2
D	Bottom Stretcher	See Detail	2
E	Rack	$\frac{3}{4}$ x $\frac{3}{4}$ x 8	12
F	Dowel Stop	$\frac{3}{8}$ Dia. x 13	2
G	Inside Hanger	$\frac{3}{4}$ x $2\frac{1}{4}$ x $9\frac{3}{4}$	2
H	Outside Hanger	$\frac{3}{4}$ x $1\frac{1}{8}$ x $9\frac{3}{4}$	2
I	Top	$\frac{3}{4}$ x $10\frac{3}{4}$ x $15\frac{1}{2}$	1
J	Handle	$\frac{3}{4}$ x $3\frac{3}{8}$ x $10\frac{3}{4}$	2





## Grandfather Clock Part II

Designed by Roy B. Cook

*Editor's Note: Last issue, in Part I, we covered how to make the base and waist sections. In Part II, we explain how to complete the construction by making the hood section and adding the movement and moon dial.*

The two end frames (parts MM, NN, OO, and PP) can be made first (Fig. 5). Cut each part to the dimensions shown on the bill of materials, but allow a little extra on the length. Lay out the 1-9/16 in. radius on one end of each part OO before cutting to shape with a band or saber saw. Make the cut slightly on the waste side of the marked line, then sand exactly to the line.

Edge-glue parts MM, NN, OO, and PP. Note that 1/4 in. diameter by 1 in. long dowel pins are used (Figs. 5 and 17) to make alignment easier when the parts are clamped. Be sure that parts OO and PP are spaced 5 3/4 in. apart (Fig. 5). Clamp with bar or pipe clamps and allow to dry overnight.

Once dry, use the table saw to trim the end frames to final length. The cuts must be square, so check your miter gauge before starting.

To apply the 1/4 in. radius to the outside of the panel opening (Fig. 6), use a router equipped with a ball-bearing piloted 1/4 in. round-over bit. You'll note the router does not produce sharp corners, so you'll need a chisel to square them up (see photo, p. 63).

On the inside of the panel opening, a 5/16 in. by 3/8 in. rabbet is cut using a ball bearing piloted 3/8 in. rabbet bit. In order to accept the glass panel (SS), the corners of the inside of the panel opening must be cut square (Fig. 5). This is best cut with a sharp chisel, using the 5/16 in. deep rabbet as a guide for the proper depth.

Next, cut the front stretcher (QQ) to size, then use a compass to scribe the 5 1/4 in. radius as shown. Cut out on the waste side of the stock, then shape and sand to the line. The 1/4 in. wide by 3/8 in. deep spline mortises are best cut on the router table equipped with a 1/4 in. diameter straight bit. However, don't make the 3/8 in. deep cut in one pass. You'll get a smoother cut, with less strain on the motor, if it's done in two passes, each pass removing 3/16 in. of material. Also, note that the spline mortise does not go all the way across the end of the stock. Instead, it is cut 5 in. long, stopping 3/8 in. short of the bottom edge.

The back stretcher (RR) can now be cut to size. Once again, use the router table to cut the 1/4 in. wide by 3/8 in. deep mortises on each end. These mortises are not stopped, but rather cut along the entire length of the end.

The mating spline mortises on parts MM and NN can now be cut (using the router table) to the same length. Cut 1/4 in. splines to fit the mortises, then dry assemble to make sure all parts fit well. It's important to remember to cut

the splines so that the grain direction is at a right angle to the joint line. If the dry assembly is satisfactory, apply glue to the splines and mortises, then clamp securely.

The hood base ends (UU) and front (VV) can be made next (Fig. 7). You'll need a piece of stock that's about 41 in. long to make all three parts. Keep in mind that these lengths provide a little extra for later trimming.

The molding-head is used to cut the edge profile. Install the cutters (Sears 9-3212), then follow the procedure discussed last issue to make the plywood inset and the auxiliary wood fence for the table saw. Once the table saw is properly set up, make the cut — but remember to do it in several passes, each pass removing a bit more stock.

Cut the 45 degree miter on the front end of parts UU, and on both ends of parts VV. To cut the spline mortises, use the router table jig shown in Fig. 8. Use a 1/4 in. diameter straight bit set to a depth of 1/8 in. Start the router and slowly lower the stock into the cutter. When the workpiece comes in contact with the table, push the workpiece forward so that the bit cuts the mortise as shown in Fig. 9. Continue making 1/8 in. deep cuts until the full 1/2 in. mortise depth is achieved.

In order to clamp parts UU and VV, you'll need to cut an 11 3/8 in. long piece of scrap stock to serve as a spacer while the frame is glued.

Cut 1/4 in. splines to fit the mortises, then dry assemble to make sure all parts fit well. If the dry assembly looks good, apply glue to the splines and mortises, then add the scrap stock spacer and clamp securely with a web clamp. Check for squareness before setting aside to dry.

Next, lay out and mark the location of the frame pin (MMM) holes in parts MM, NN, and UU. Bore the holes, then dry assemble the hood case to the hood base frame (parts UU and VV) and check for squareness.

The two side spacers (WW) and the front spacer (XX) are next. After cutting the parts to length and width, use a compass to scribe the 5 7/8 in. radius on part XX as shown in Fig. 10. As before, cut out with a band or saber saw then shape and sand to the line.

Parts WW can now be joined to the end frames with four 1 1/4 in. by number 8 flat-head wood screws. In order to allow the end frame to move with seasonal humidity changes, the screw holes through parts WW should be slightly oversized (about 5/32 diameter). Note that the front edge of part WW is flush with the front edge of the end frame. Also note, as shown in Fig.

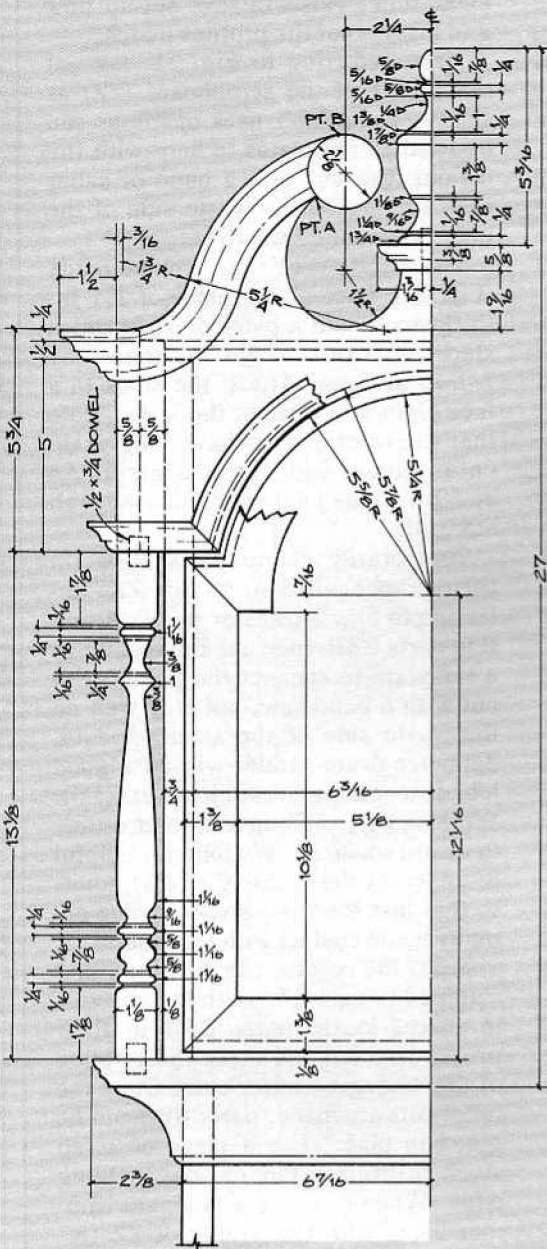
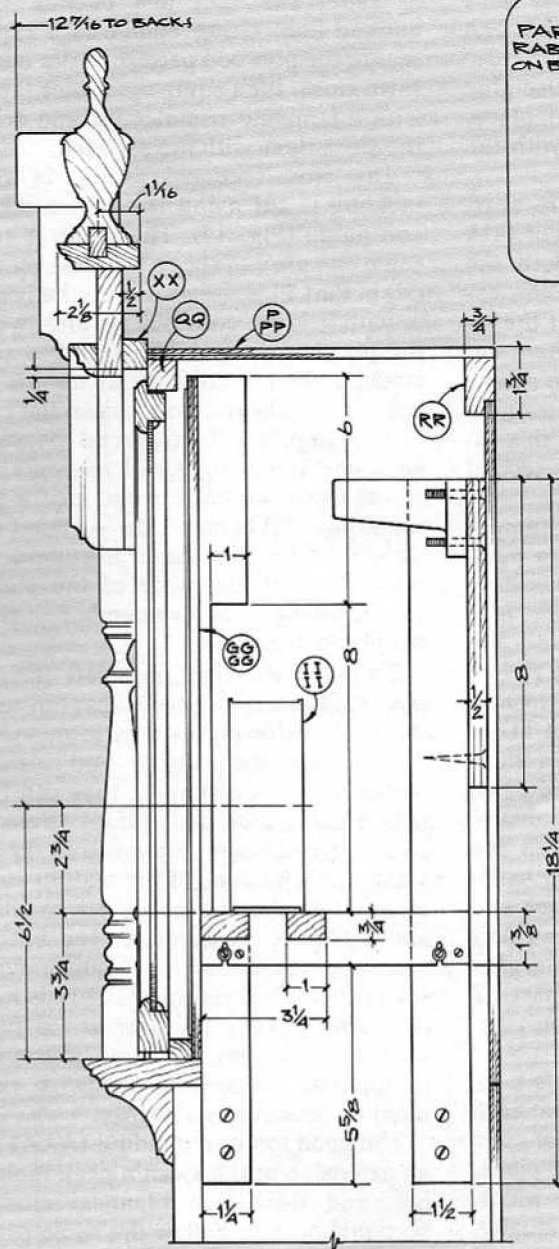


FIGURE 2



SECTION THROUGH CENTER  
FIGURE 3

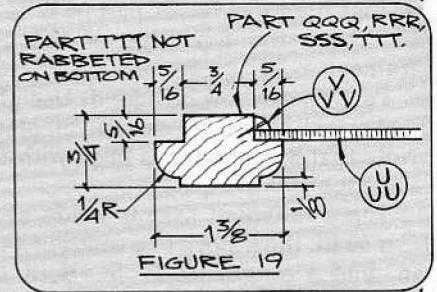


FIGURE 19

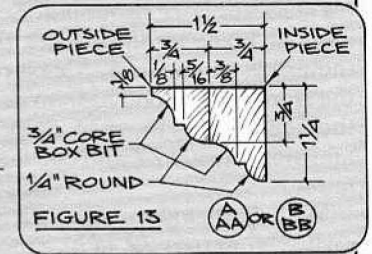


FIGURE 13

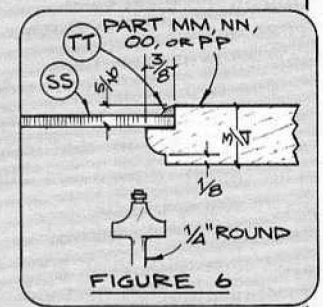


FIGURE 6

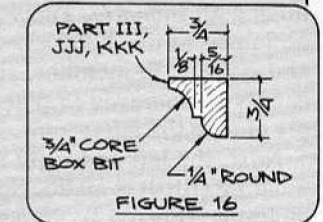


FIGURE 16

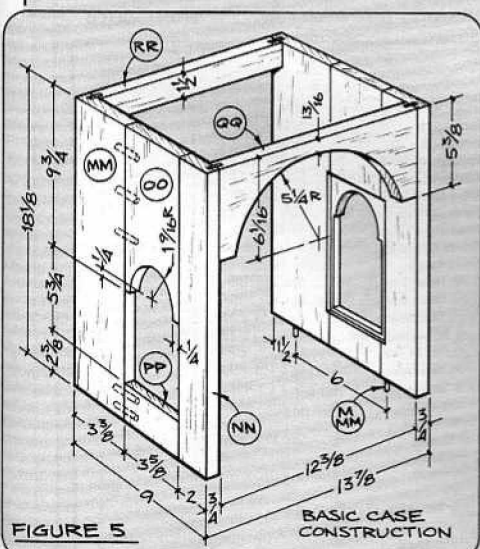


FIGURE 5

BASIC CASE CONSTRUCTION

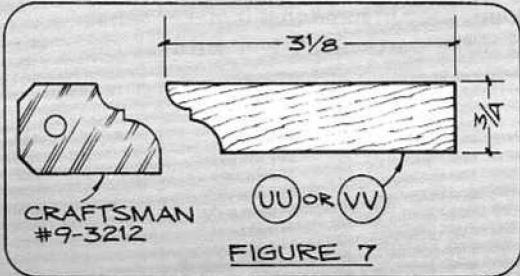


FIGURE 7

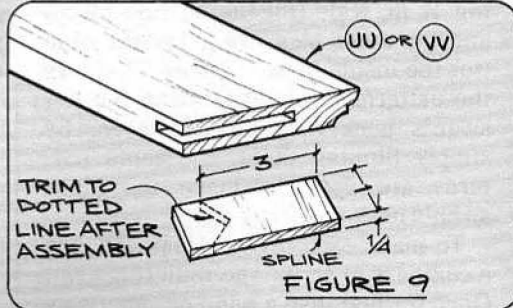


FIGURE 9

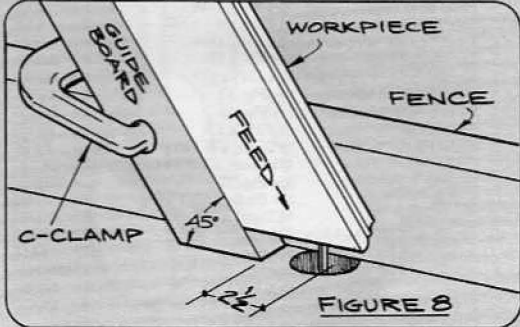


FIGURE 8

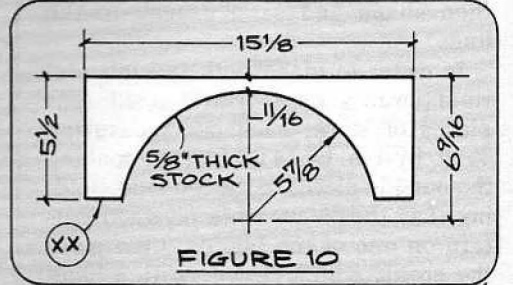


FIGURE 10

4, that the top edge of part WW is 1/2 in. above the top edge of the end frame.

Part XX can now be added. Use glue and wood screws to secure in place. Note that its top edge is flush with the top edge of WW.

The scrollboard (ZZ) is made next. Cut 3/8 in. thick stock to a width of 11 1/2 in. and a length of 17 in. Both the width and length dimensions allow extra stock for later trimming. Set the table saw blade at 45 degrees then, cut the miter on one end. Measure across the front of the hood case to determine the needed length, then mark this dimension on part ZZ and cut the second miter.

With both miters now cut, temporarily clamp part ZZ in its proper position on the hood case. Note the bottom edge of part ZZ is flush with the bottom edge of part WW.

The two scrollboard sides (YY) can now be made. Cut 3/8 in. thick stock to a width of 5 3/4 in. and length of 11 in. The length dimension allows a little extra stock. Cut the 45 degree miter on the front end, taking care to insure that it results in a good fit with the mating miter on part ZZ. When satisfied with the fit-up, trim the back end flush with the case. Parts YY can now be joined to the hood case using glue and clamps. Remember, since part ZZ is only temporarily in place, don't apply glue to the miter joint.

Next, the left and right swan's neck molding (BBB) is made. Note that each molding (Fig. 13) consists of two pieces; a 3/4 in. by 3/4 in. outside piece, and a 3/4 in. by 1 1/4 in. inside piece. These pieces are shaped individually, then joined with glue later on. You'll need two patterns (see Fig. 12) made from 1/2 in. thick plywood; one measuring 3/4 in. wide (for the outside piece) and the other measuring 1 1/4 in. wide (for the inside piece). Figure 12 shows the patterns oriented to make the left swan's neck molding. However, by simply flipping them, the same patterns are used to make the right swan's neck molding.

To make each plywood pattern, use a compass to scribe the radii (Fig. 12). Once scribed, use a band or saber saw to cut just outside the marked lines, then shape and sand exactly to the lines.

In order to make both the left and right swan's neck, you'll need four pieces of stock, each one measuring 3/4 in. by 4 in. by 14 in. Start by making the outside pieces of the left side molding. Lay the 3/4 in. wide plywood pattern on one of the boards, then trace the profile with a pencil. With a band

or saber saw, cut just outside the marked line. Using double-face tape, secure the plywood pattern to the band sawn stock, then equip the router table with a laminate trimmer bit and trim the stock flush with the plywood.

The cross-sectional profile of the molding is cut using the router table and guide (Fig. 14). The guide is the same one used to shape the base panel (K) in Part I last issue. Equip the router with a 3/4 in. core box bit and, with the plywood pattern still taped to the stock, make the cove cut as shown in Fig. 14. As always, don't make the cut in one step, do it in several passes, each one removing small amounts of stock. Once the cove is cut, use a 1/4 round-over bit to make the 1/4 round as shown. Follow the same procedure to make the outside piece of the right side molding — just remember to flip the plywood pattern.

To make the right and left inside pieces, repeat the above steps, but use the 1 1/4 in. wide plywood pattern.

Now that the outside and inside pieces have been shaped, they can be joined using glue and clamps. Before adding glue though, drive two or three small brads into one of the mating surfaces, then clip the heads off so that about 1/16 in. is exposed. The brads will keep the parts from sliding over each other when clamp pressure is added. And to keep the narrow (3/8 in.) edge from denting as clamp pressure is applied, it's best to sandwich the molding between two boards.

The hood top end molding (AAA) is an extension of the swan's neck molding, and it has an identical cross-sectional profile. Follow the same procedure as was used to make the swan's neck, but use straight stock for the plywood patterns. From a practical standpoint, keep in mind that it makes sense to make parts AAA and BBB at the

same time. This will save set-up time and insure that the profiles match.

Next, referring to Fig. 11, lay out the profile of the scrollboard (ZZ) as shown. The swan's neck moldings can be used as templates to help with the lay out. Cut out with a band or saber saw, staying on the waste side of the line. Don't sand smooth yet.

The rosette (FFF) can now be made (Fig. 22). Face-glue a piece of 1 1/4 in. thick stock, and a piece of 3/4 in. thick stock, then trim to 2 3/16 in. square by 2-3/16 in. long. Attach the stock to a face plate and turn on the lathe. Note that the rosette must have long grain on its turned end, not end grain. An end grain glue joint won't have enough strength.

Temporarily clamp parts BBB (in their proper position) to part ZZ. Referring to Fig. 2 transfer points A and B to parts BBB, then use the rosette as a template to connect the points. Cut out with a band saw, but stay well on the waste side of the stock. A 2 in. diameter drum sander will do a good job of smoothing the cut to an exact fit. Work slowly, sanding a little at a time to insure accuracy. We found it helpful to undercut the molding at this point, so that just the front and top edge actually made contact with the rosette.

Next, the rosette can be glued and clamped to part ZZ. With the rosettes in place, locate parts BBB in their proper position and mark the location of the 45 degree miter cuts. Once the miter cuts are made, parts BBB can be glued in place. Use a piece of scrap stock to protect the narrow molding edge. When dry, use a laminate trimmer bit to trim the profile of ZZ (remember this was cut oversized) flush with parts BBB and FFF. Part ZZ can now be glued to the hood case.

Turn the four spindles (GGG) to the dimensions shown (Fig. 2), then bore

Bill of Materials  
(All Dimensions Actual)

Part	Description	Size	No. Req'd.	Part	Description	Size	No. Req'd.
MM	End Frame Back Stile	3/4 x 3 3/4 x 18 1/4	2	OOO	Back Lock	3/16 x 5/8	3
NN	End Frame Front Stile	3/4 x 2 x 18 1/4	2	PPP	Hood Top	3/4 x 13 3/4 x 9	1
OO	End Frame Top Rail	3/4 x 3 3/4 x 9 1/4	2	QQQ	Hood Door Stile	3/4 x 1 3/4 x 12 1/2	2
PP	End Frame Bottom Rail	3/4 x 3 3/4 x 2 3/4	2	RRR	Hood Door Right Arch	See Fig. 18	1
QQ	Front Stretcher	3/4 x 5 3/4 x 12 3/4	1	SSS	Hood Door Left Arch	See Fig. 18	1
RR	Back Stretcher	3/4 x 1 1/2 x 12 3/4	1	TTT	Hood Door Bottom Rail	3/4 x 1 3/4 x 13	1
SS	Glass Panel	3/4 x 4 1/4 x 8-3/16	2	UUU	Hood Door Glass	3/4 Thick	1
TT	Plastic Glass Retainer	3/16 quarter-round	As Req'd.	VVV	Plastic Glass Retainer	3/16 quarter-round	As Req'd.
UU	Hood Base End	3/4 x 3 3/4 x 10 3/4	2	WWW	Brass Latch	3/4 Diam.	1
VV	Hood Base Front	3/4 x 3 3/4 x 17 1/4	1	XXX	Hood Door Top Hinge	See Fig. 20	1
WW	Side Spacer	3/4 x 5 1/2 x 9	2	YYY	Hood Door Bottom Hinge	See Fig. 20	1
XX	Front Spacer	3/4 x 5 1/2 x 15 1/4	1	ZZZ	Front Mounting Post	3/4 x 1 1/4 x 21	2
YY	Scrollboard Side	3/4 x 5 3/4 x 10 1/4	2	AAAA	Back Mounting Post	3/4 x 1 1/2 x 18 1/4	2
ZZ	Scrollboard	3/4 x 11 1/2 x 17*	1	BBBB	Seatboard Cleat	3/4 x 1 1/4 x 7	2
AAA	Hood Top End Molding	See Fig. 13	2	CCCC	Front Seatboard	3/4 x 1 1/4 x 9 1/4	1
BBB	Swan's Neck Molding	See Fig. 13	2	DDDD	Back Seatboard	3/4 x 1 x 9 3/4	1
CCC	Finial Base	3/4 x 2 1/4 x 2 1/4	1	EEEE	Chime Board	1/2 x 8 x 11 1/4	1
DDD	Finial Pin	1/2 Diam. x 3/4 Long	1	FFFF	Chime Block		1
EEE	Finial	1 1/2 Diam. x 5-3/16 Long	1	GGGG	Dial Board	See Fig. 21	1
FFF	Rosette	See Fig. 22	2	HHHH	Moon Dial		1
GGG	Spindle	1 1/2 Diam. x 13 1/4 Long	4	IIII	Movement		1
HHH	Spindle Pin	1/2 Diam. x 3/4 Long	8	JJJJ	Hands		1 Set
III	Scrollboard Side Molding	See Fig. 16	2	KKKK	Cable Hanging Plate		1
JJJ	Scrollboard End Molding	See Fig. 16	2	LLLL	Pulley		3
KKK	Scrollboard Arch Molding	See Fig. 16	1	MMMM	Weight Shell		3
LLL	Cleat	1/2 x 1/2 x 12 1/4	1	NNNN	Weight Filling		3
MMM	Frame Pin	3/4 Diam. x 1 Long	4	OOOO	Pendulum	* Length and width dimensions allow extra stock.	1
NNN	Hood Back	3/4 x 13 3/4 x 17 1/4	1				

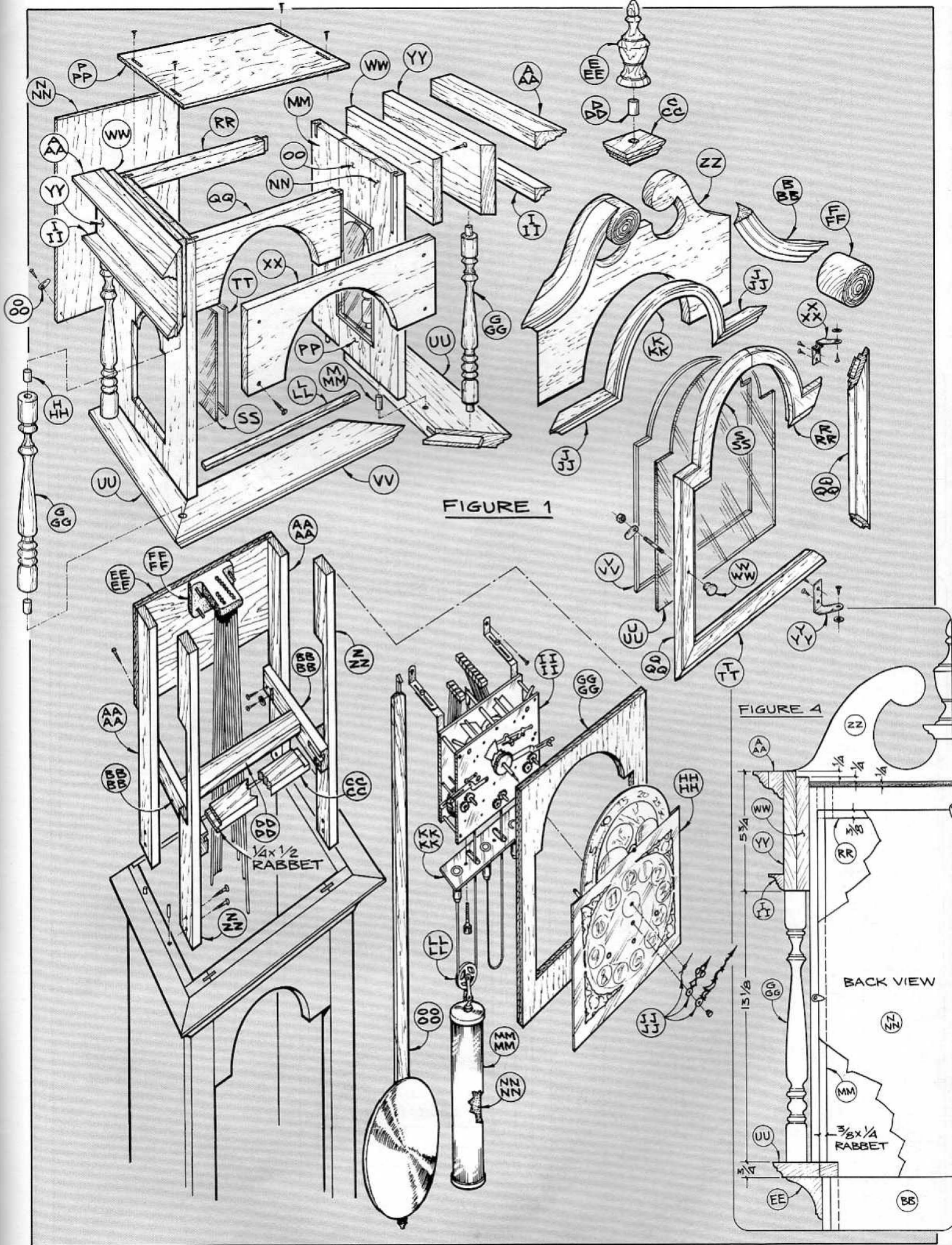


FIGURE 1

FIGURE 4

1/4 x 1/2 RABBET

BACK VIEW

3/8 x 1/4 RABBET

5 3/4

1 5/8

1/4

1/4

1/4

1/4

3/8

5/8

1/2

1/4

1/4

1/4

1/4

1/4



the ½ in. diameter by ¾ in. deep holes in each end to accept the spindle pins (HHH). Make sure the holes are square. Next, lay out and bore the four spindle pin holes in parts UU (Fig. 17).

Dry fit the four spindles (with the four bottom spindle pins) on the hood base frame, then mark the proper location of the top end of the spindle. Because the top spindle pin holes are close to the hood case, a brace and bit must be used. Locate the bit at the centerpoint of the hole, crank the brace one-half turn, then ratchet back. Repeat the process until the hole is bored to a ¾ in. depth.

The scrollboard arch molding (KKK) is made next. Cut stock to the dimensions shown in Fig. 15, then cut the 45 degree miters as shown. Now, scribe the two radii and cut out with a band or saber saw. Shape and sand the edges to the scribed line. Next, use the router table and guide to cut the profile shown in Fig. 16.

To make the scrollboard side and end molding (III and JJJ), rip stock (about 36 in. long) to ¾ in. square. Cut the profile at the same time the profile for KKK is being cut.

Part KKK can now be glued and clamped to the hood case. When dry, parts III and JJJ can be added. Cut the 45 degree miters with care in order to insure a good fit.

The hood base frame (UU and VV) and the spindles (GGG) can now be assembled to the hood case. Apply glue to the mating surfaces, then clamp firmly and check for squareness.

When dry, use a router equipped with a piloted ¾ in. rabbet bit to cut the ¼ in. deep rabbet for the hood back (NNN). Use a chisel to square the two upper corners and to notch the back edge of parts UU.

Part NNN is made from ¼ in. walnut plywood (available from: Constantine, 2050 Eastchester Road, Bronx, NY 10461). When buying the plywood, keep in mind that the base (P) and waist (BB) backs (shown in last issue), and the dial board (GGGG) are also made with ¼ in. walnut plywood.

The finial base (CCC) is made as shown and glued in place. The finial (EEE) is then turned (Fig. 2) and glued using the finial pin (DDD) for added strength.

As the name implies, the movement support framework (parts ZZZ, AAAA, BBBB, CCCC, DDDD, and EEEE) serves to support the movement and its associated hardware. It is assembled as shown and secured to the inside of the waist side (X) with 1¼ in. by number 8 wood screws (Fig. 3). Each of the front mounting posts has a 1 in. by 8 in. notch in order to facilitate

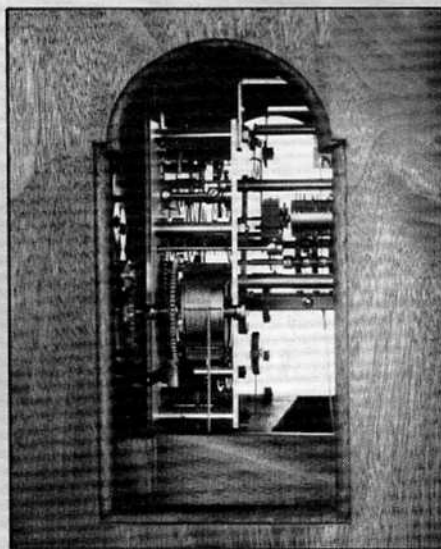
installation and to expose more of the movement (III) when viewed through the glass panel (SS).

To make the hood door right and left arches (RRR and SSS), cut two pieces of ¾ in. thick stock; each one measuring 3½ in. wide by 11 in. long (Fig. 18). Cut a 45 degree miter on one end of each piece and temporarily join the two mitered ends with a spot of glue. Use a band or saber saw to cut the clamp notches.

Now, referring to Fig. 18, lay out the profile of parts RRR and SSS as shown. Also carefully lay out the location of the spline mortises.

Next, break the temporary glue joint and transfer the spline mortise location to the ends of the miter. Use a sharp chisel to cut each one. Apply glue to the spline and mortises, then clamp the parts together with a pair of C-clamps.

When dry, use the table saw to cut the miter on each end, and the band or saber saw to cut the remaining profile. As always, cut just outside the marked line, then shape and sand.



*Glass panel (SS) permits view of triple-chime movement.*

Parts QQQ and TTT are now cut to size and mitered as shown. Again, lay out and mark the mortise location before cutting out with the chisel. Check for squareness before setting aside to dry. To cut the ¼ in. bead and back rabbet (Fig. 19), follow the same procedure that was used to cut the waist door in last issue.

The door hinges (XXX) are made from .032 in. thick brass stock (Fig. 20). Bend and shape as shown, then mortise the door and install.

The hood case can now be joined to the waist section. A pair of ¾ in. diameter by ¾ in. long dowel pins are used for added strength. Apply glue to the mating surfaces, then clamp firmly. Keep in mind that the upper waist side

and front moldings (EE and FF), are not joined to the case yet. We showed how to make these moldings in the last issue.

At this point, three or four coats of a good penetrating oil can be added to all parts.

The triple-chime cablewound movement (III), weight filling (NNNN), and moon dial (HHHH) were purchased from the Mason and Sullivan Co., 586 Higgins Crowell Road, West Yarmouth, MA 02673. The movement comes complete with a chime block (FFFF), pendulum (OOOO), solid brass weight shells (MMMM), winding crank (not shown), and hands (JJJJ). The movement will play either Westminster, Whittington, or St. Michael chimes. Order part number 3281X. Current price is \$269.00.

The high arch moon dial (HHHH) measures 11 in. wide by 15½ in. high. Its part number is 3902X and the price is \$127.00. For the weight fillings (NNNN) order part number 9159L. The price is \$29.50. The prices do not include shipping charges.

When installed, the movement rests on the front and back seatboards (CCCC and DDDD). The notches cut in parts BBBB allow some vertical adjustment. For depth (in and out) adjustment, the movement can be moved on the seatboard parts. Make sure, however, that the cables do not contact the seatboard parts. If they do, you'll need to cut a small notch in parts CCCC or DDDD to allow free movement.

Along with their movement, Mason and Sullivan provides a 32 page booklet that explains, in detail, how to install it. The booklet also covers operation, troubleshooting, and maintenance. Their instructions take you through the process, from beginning to end.

The dial board (GGGG) can now be made (Fig. 21) using ¼ in. walnut plywood. It's glued to the front edge of parts ZZZ (Fig. 3). The bottom of the dial board rests on part VV, but the two parts are not glued. The cleat (LLL) is then glued to part VV, but not to the dial board.

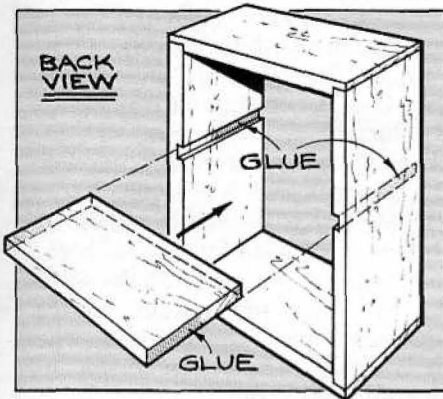
The moon dial is now added. For installation instructions, refer to Mason and Sullivan's literature.

The brass latch (WWW), plastic glass retainer (TT and VVV), and back locks (OOO) can be ordered from Craft Products Company (see last issue for their address and part numbers). You'll need to have the hood door glass (UUU) cut by a glass shop.

The installation of the hood back (NNN), hood top (PPP), and waist moldings (EE and FF) completes the project.

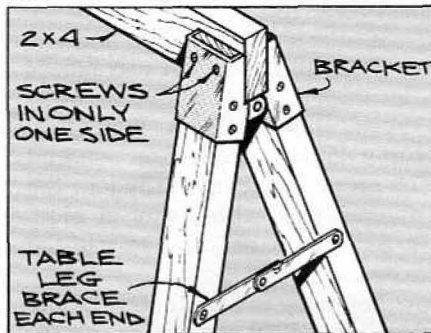
# Shop Tips

It's not uncommon to face a situation whereby a shelf must slide into a dado groove cut into an assembled carcass. Normally, glue is applied to the full dado length and its mating shelf edge. However, the glue tends to swell the wood, making it difficult to slide in place. Also, the tight fit causes most of the glue to be squeezed out, reducing



the strength of the joint. Next time, minimize this problem by applying glue to the back half of the shelf and the front half of the dado as shown.

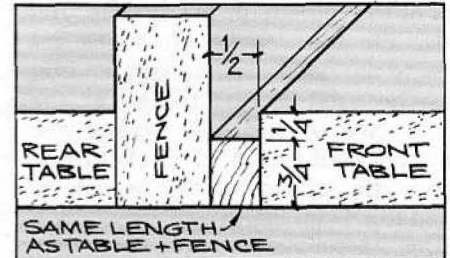
A hardware store variety sawhorse bracket, along with a table leg brace



on each end, results in a sturdy sawhorse that folds flat for easy storage.  
Robert W. Waggoner, Anderson, Ind.

Many Early American style projects are made using pine solid stock. However, if the design specifies a 1/4 in. plywood back or door panel, you'll probably be disappointed with the look of standard fir plywood. Knotty pine plywood looks best, but most lumberyards don't stock it. Next time you're in need, check the lumberyard or building supply center that sells pine kitchen cabinets. They usually sell small sheets of knotty pine plywood to be used on pine base cabinets that don't butt against a wall.

On a radial-arm saw, if sawdust keeps the workpiece from butting against the fence, a cross-cut will no longer be exactly 90 degrees. Keeping the fence clean means brushing the sawdust away after every cut, a procedure that many woodworkers find bothersome. My solution was to create



a "dust pocket." It's made by cutting a strip of 1/2 in. by 3/4 in. stock and locating it against the fence as shown. Now I only need to use the brush when the "pocket" is nearly full.

Bill Jenkins, Richmond, Va.

A short length of adhesive-backed magnetic strip, makes it easy to make clamp pads. Cut the strip to length, then secure it to a piece of 1/4 in. plywood. The magnet will hold the pad in place while the clamp is properly positioned.

David W. Worden, Pontiac, Mich.

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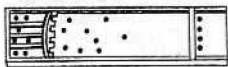
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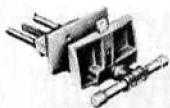
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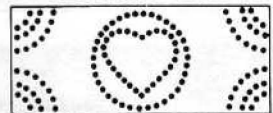
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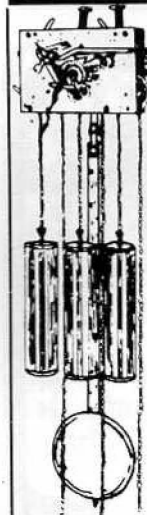
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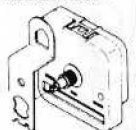


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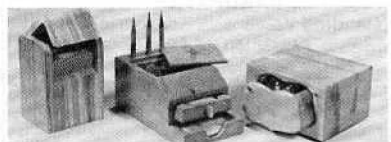
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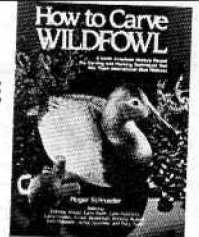


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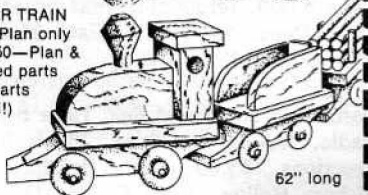
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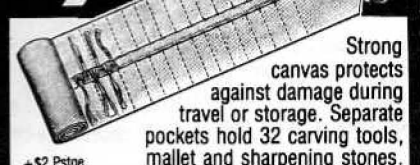
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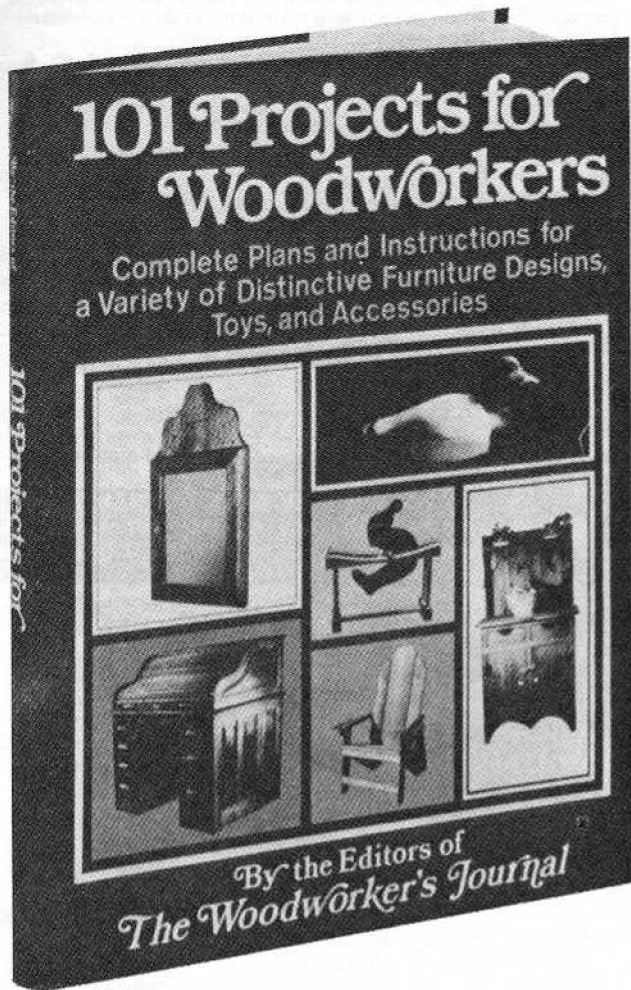
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