Fine WoodWorking

MARCH/APRIL 1981, NO. 27, $3.00

Inlay

There's a wealth of information and ideas in the back issues of Fine Woodworking

Our readers tell us they regard *Fine Woodworking* more as a reference resource than as a magazine because of the timeless and hard-to-find nature of its contents. And because there is so much material to cover (new ideas and techniques pop up all the time) we don't intend to repeat ourselves editorially. All 26 back issues are now available and you can have a complete set for your shop.

1 Turning checkered bowls, making planes, French polishing, marquetry cutting. Plans for stamp box, wall shelf.

2 Eagle carvings, hand dovetailing, buying antique tools, oil/varnish finish, Gustav Stickley. Plans for spiral library steps, Shaker lap desk, rocking camel.

3 Close look at wood, making the mortise-and-tenon, desert cabinetry, turning green bowls. Plans for gate-leg table, stroke sander; survey of plans in print.

4 Krenov's notebook, wood and moisture, ornamental turning, exotic woods, heat-treating steel. Plans for Scandinavian workbench, hidden bed.

5 Stacking, carcase construction, using plywood, drying wood, guitar joinery, making shaper knives, deep bowl gouge. Plans for Gothic tracery, Duncan Phyfe chair, Adam side table.

6 Wooden threads, hand scraping, bent lamination, expanding tables, layout on two sticks, stacked plywood, pricing work. Plans for lumber-drying kiln, serving cart. Survey of woodworking schools.

7 Glues, lute roses, bowl turning, doweling, spalted wood, pine furniture, fan carving. Plans for 3-legged stool, solar dry-kiln, bent-laminated tray. Issues 1-6 index.

8 Steam bending, triangle layout, chain-saw lumber making, bowsaws, moisture meters. Plans for wooden clamps, Aztec drum, flageolet, double-ratchet gout stool, marking gauge.

9 Classical proportions, tall chests, entry doors, drawer bottoms, health hazards, blacksmithing, carving exercises. Plans for extension dining table, Shaker round stand, small turned boxes. Hardware sources.

10 Wooden clockworks, hammer veneering, ball & claw feet, laminated and staved turnings, chain-saw carving, circular saws. Plans for 2-way screen hinges, louvered doors, small workbench.

11 Dovetailed drawers, turning spalted wood, leather inlay, finishing notes, pencil gauges, hanging doors, dulcimer peg boxes. Plans for spinning wheels, scratch beader, Parson's tables, tool cabinets.

12 Greene & Greene, holding the work, tambours, stains and dyes, spindle turning, cleaving wood, sharpening, sanding, checks in veneer. Plans for corner-cupboard cockleshell, dust-collection system, shaving horse.

13 Relief carving, preparing stock, tung oil, roll-top desks, machine maintenance, lumber grading. Plans for turned microscope, end-boring jig.

14 George Nakashima, tapered laminations, turning planes, chair critique, incised lettering, air-powered tools. Plans for box-joint jig, world globe, Austrian commode. Issues 1-13 index.

15 Making violins, stalking mesquite, mortise-and-tenon, milk paint, wooden aircraft, routed signs, staved containers, gilding. Plans for router table, treadle lathe, carved shells.

16 Edward Barnsley, wedged and pinned tenons, hollow turnings, preparing to finish, chair critique. Plans for vacuum press, circular stairs, workbench.

17 Sawmilling, timber joinery, bending compound curves, routing for inlays, tips for precision, finishing materials. Plans for solid wood doors, heavy-duty shaper, library steps. Planer survey.

18 Showcase cabinets, tapered sliding dovetails, haunched tenons, rule joint, turning chisels, rubbed finishes, cabriole legs, paneled doors and walls. Plans for drop-leaf and gate-leg tables.

19 Wharton Esherick, oyster veneering, PEG, oil/varnish mixes, chip carving, mortising machines, adjusting the jointer, wooden toys. Plans for baby rattles, toy dragonfly, toy trucks, turner's gauges. Band-saw survey.

20 Michael Thonet, one-piece plywood chair, split ash baskets, woven cane seating, Japanese planes, shaper cutters and fences, chair repair. Plans for fishing net, knock-down tables, adjustable plane, pigeonhole desk. Index to hardwood sources.

21 Hans Wegner, machine design, abrasives, woodturning explorations, ogee bracket feet, hewing, dowel joints, carcase dovetails. Japanese saws. Plans for three sanding machines. Issues 1-20 index.

22 Kerf-bent boxes, cowhide chair seats, solar wood-drying, saw sharpening, furniture conservation, shop math, backed veneers. Plans for easy chair and sofa.

23 Reproductions, blockfronts, turning thin bowls and spindles, carousel horses, hardwood plywood, carbide circular saws, frame-and-panel, pistol cases. Plans for blockfronts, post-and-panel chest, disc sander.

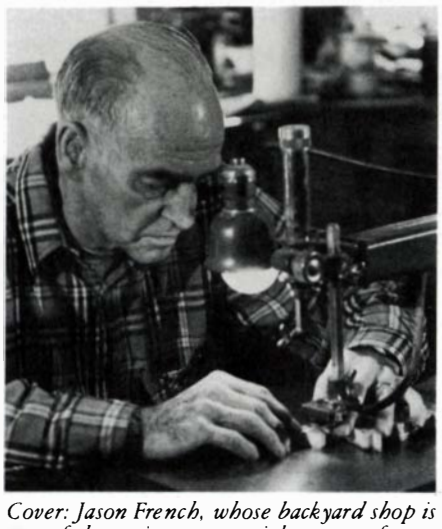
24 Setting up small shops, 3-phase power, making carver's gouges, production woodworking. Plans for vise, walking-beam saw, workbench, lumber rack, tool rack and box, sawhorses. Combination machine survey.

25 Sam Maloof, router rail, dust collection, bandsaw boxes, precision in joinery, butterfly joint, lathe tuning, two chucks, elm and chestnut, marquetry finishing, drawknife. Plans for pedestal table.

26 Arts & Crafts movement, curved-shoulder joinery, oil finishes, abnormal wood, large sculpture, patternmaking. Plans for mosaic doors, tall-case clock, table-saw miter jigs. Survey of woodworking schools.

To order back issues of *Fine Woodworking*, use the order form in the back of the magazine or send your name and address and the numbers of the back issues you want, along with your payment to the address listed below. Each back issue is $3.00 postpaid ($4.00 foreign). Connecticut residents add 7½% sales tax.

The Taunton Press 52 Church Hill Road, Box 355, Newtown, Connecticut 06470



Cover: Jason French, whose backyard shop is one of the major commercial sources of marquetry inlay, assembles a floral insert with razor knife and hot hide glue. The finished piece, the pattern for which appears on p. 47, is shown inlaid in a cherry ground, along with some of the tiny pieces that compose it. Above, French jigsaws a stack of 16 veneers to produce some of those pieces. His methods, applicable to any sort of pattern, in any quantity, are described in the article that begins on p. 46. Several articles in this issue deal with decorative inlay, including wood banding, mother-of-pearl and abalone.

Fine WoodWorking®

MARCH/APRIL 1981, NUMBER 27

DEPARTMENTS

4 Letters
14 Methods of Work
24 Questions & Answers
32 Books
34 Business Notes
36 Adventures in Woodworking
40 Events/Connections

ARTICLES

44 **Sue and Mare** *by Roger Holmes*
Decorative inlay connects past to unorthodox modernism

46 **How Inlay is Made** *by Rick Mastelli*
Commercial techniques for marquetry inserts and banding

50 **Inlaying Mother-of-Pearl** *by John Lively*
Watching one banjo maker cut and fit a delicate design

53 **A Jigsaw for Cutting Delicate Stock** *by Ken Parker*
Treadle power and spring return are ideal for pearl inlay

56 **Armand LaMontagne** *by Roger Schroeder*
Sculpting wood as if it were clay

60 **Shaker Blanket Chest** *by John Kassay*
A new book of measured drawings

62 **Spline-Mitered Joinery** *by Eric Hoag*
Concealed strength for fine lines

65 **Coloring with Penetrating Oils** *by Oscar MacQuiddy*
A little dab goes a long way

68 **Template Dovetails** *by Charles Riordan*
Another way to skin the cat

71 **Chisels, and How to Pare** *by Ian J. Kirby*
Master the grip and stance before tackling joinery

76 **Alan Peters** *by Simon Watts*
From Arts and Crafts to Chinese Gothic

82 **The Basics of the Bandsaw** *by Tage Frid*
Setting up and using this versatile machine

87 **The State of the Forests** *by Eugene Wengert*
Where our wood comes from and where it's going

90 **The Woodcraft Scene**
Two Shows in Santa Fe *by James A. Rannefeld*

92 **Inventing Marquetry**

Fine Woodworking (ISSN 0361-3453) is published bimonthly, January, March, May, July, September and November, by The Taunton Press, Inc., Newtown, CT 06470. Telephone (203) 426-8171. Controlled-circulation postage paid at Newtown, CT 06470, at Hartford, CT 06101 and at New York, NY 10001. Subscription rates: United States and possessions, $14 for one year, $26 for two years; Canada, $17 for one year, $32 for two years (in U.S. dollars, please); other countries, $18 for one year, $34 for two years (in U.S. dollars, please). Single copy, $3.00. Single copies outside U.S. and possessions, $4.00. Send to Subscription Dept., The Taunton Press, PO Box 355, Newtown, CT 06470. Address all correspondence to the appropriate department (Subscription, Editorial or Advertising). The Taunton Press, 52 Church Hill Road, PO Box 355, Newtown, CT 06470. United States newsstand distribution by Eastern News Distributors, Inc., 111 Eighth Ave., New York, N.Y. 10011. Postmaster: Send notice of undelivered copies on Form 3579 to The Taunton Press, PO Box 355, Newtown, CT 06470.

Over the years a number of offerings have appeared in these pages on the problem of checking the accuracy of the try square, indicating that the problems I've had with this instrument are fairly common. Driven by frustration with the junk that is on the market, I worked out a method that is more sensitive than any other I've heard of. You can check a square quite accurately with an inexpensive pocket mirror. Variety stores have them—double-sided, about 2 in. by 3 in.—for less than a dollar. You might want to check the parallelism of the faces and the reflecting surfaces by laying it flat on your bathroom mirror and checking for any image deviation as you move your eye across the field.

To check the square, hold it with the stock pointing left, the blade toward you. Lay the mirror flat against the face of the stock, so that you can sight along the edge of the blade and its reflection. If the two appear to form a continuously straight line, the stock is square to the blade. Any apparent deviation is double the error.

The method has many applications beyond the try square. I've used it to square the miter gauge on the table saw. I've used it to square up large assemblies before clamping. With only the mirror and a straightedge, you can even strike a perfect right-angle line across a board.

—Richard J. Mann, Los Angeles, Calif.

I have just begun to read my January/February issue of *Fine Woodworking*, but I find it both appropriate and necessary to take the time to write concerning Oscar MacQuiddy's suggested use of methyl ethyl ketone as a solvent during the process of refinishing furniture. While he does suggest the use of protective gloves, he has, perhaps out of innocent ignorance, overlooked a much more important safety precaution that must be taken whenever methyl ethyl ketone (MEK) is used. MEK is the hardening agent commonly provided with marine or automotive fiberglass resins, and no warnings are ever provided for its use in this application either. A year ago, I permanently blinded myself in my left eye when I accidently got some methyl ethyl ketone into my eye while preparing resin for use in repairing a car body. The effect was both painful and immediate. In less time than it took me to run across the yard from the garage to my house, my eye had become a hardened, brown lump. Doctors confirmed my fears that the blindness was indeed permanent, and that the MEK had altered the eye tissue beyond repair.

Please! When using methyl ethyl ketone, wear the tightest-fitting safety goggles you can find. Be able to admire the fruits of your labors. *—Mike Hubley, Lancaster, Pa.*

Dr. Michael McCann of the Center for Occupational Hazards comments: There is some confusion here. The hardener used with fiberglass (polyester) resin is methyl ethyl ketone peroxide (MEKP), not methyl ethyl ketone (MEK), which is a solvent. You are entirely correct about the danger of blindness from splashes of MEKP in the eyes, and chemical splash goggles should always be worn when using MEKP. The solvent MEK is not as dangerous, but, like most solvents, it can cause eye irritation and possible blindness if splashes are not rinsed out immediately. For this reason chemical splash goggles are always recommended when splashes are possible. All goggles should be ANSI (American National Standards Institute) approved.

When I opened the last issue of your magazine and found a recipe to broil lamb chops I immediately turned to the masthead to see if Julia Child had joined your staff. I would like to

INDEX TO ADVERTISERS

Abrasive Service Co., Inc.	7	Garden Way Research	11	The Sawmill	6
Adjustable Clamp Co.	17	Garrett Wade Co.	23,35	School of Clock Repair	23
American Intertool, Inc.	29	General Woodcraft	41	Sculpture Associates, Ltd.	29
American Machine & Tool Co.	15	Gilliom Mfg., Inc.	23	Shopsmith Inc.	9
American Machinery & Motor Co.	27	Glenn Wing Power Tools	37	Singley Specialty Co.	35
American Woodcrafters	21	The Guild of Master Craftsmen	40	Sleepy's Toys	15
AMI, Ltd.	18	Heritage Design	43	Sperber Tool Works Inc.	27
Anderson Ranch Arts Center	13	Highland Hardware	39	SterlingHardwoods, Inc.	29
Anson Industries Inc.	34	Horton Brasses	39	Stewart-MacDonald	17
Appalachian Center for Crafts	7	Hot Tools, Inc.	27	Sun Designs	43
Armor Products	15	Industrial Abrasives Co.	6	The Taunton Press, Inc.	2,2A,2B, 25,33,90A,90B
Arrowmont School of Arts & Crafts	37	International Woodworking Equipment Co.	28	Teak Designers	18
Artistry in Veneers	39	The Jamestown Artisan Center	21	Tech Plywood & Hardwood	41
Ball & Ball	37	John Harra Wood & Supply Co.	20	Technova	27
The Bartley Collection, Ltd.	39	Kaymar Wood Products, Inc.	15	Thomas Woodcraft	30
Belsaw Power Tools Co.	16	Kirby Studios Ltd.	8	Toolmark Co.	21
Bimex, Inc.	15	Kuempel Chime & Clock Works	7	The Toolroom	41
Boston University	35	Kuster Woodworkers	30	Turncraft Clock Imports Co.	22
Brigham Young University	18,31	Lee Valley Tools Ltd.	10	Turning Point Mfg. Inc.	21
The Brink & Cotton Mfg. Co.	26	Leeds Design Workshops	22	Unicorn Universal Woods Ltd.	22
Buck Bros. Inc.	13	Leichtung, Inc.	19	University of California	29
Chem-Tech	41	Leonard Lumber Co.	39	Vermont American Hardware Tool Div.	23
Chester B. Stem, Inc.	8	Love-Built Toys & Crafts, Inc.	9	Vermont Furniture Hardwoods	37
Clock Crafters International, Ltd.	29	Mason & Sullivan	35	Weird Wood	35
Conover Woodcraft Specialties	13	Maurice L. Condon Co., Inc.	17	The Wendell Castle Workshop	43
Constantine	28	Mc Call House	41	Welbeck Sawmill Ltd.	41
Craftsman's Corner	38	Merchantmen, U.S.A., Ltd.	43	Wetzler Clamp Co., Inc.	8
Craftmark Products, Inc.	9	Morgan Veneers	15	Williams & Hussey Machine Corp.	5
Craftplans	23	Morris Wood Tool Co., Inc.	31	Willard Brothers Woodcutters	13
Craftsmanship in Wood Inc.	43	Native American Hardwoods	43	Winchester Carbide Saw, Inc.	15
The Crane Creek Co.	41	The Nutty Co., Inc.	15	Wisner Tools	43
Croy-Marietta Hardwoods, Inc.	26	Parks Woodworking Machine Co.	9	Wood Is Good Co.	41
The Cutting Edge	7	Paxton Hardware	7	Wood Shed	37
David A. Keller	7	Peter Child	15	The Wood Store	27
The Decorative Hardware Studio	9	The Plywood Depot Inc.	27	Wood World	39
Delmhorst Instrument Co.	17	Pootatuck Corp.	10	Woodbutcher Tools	35
Derda Inc.	26	Prakto, Inc.	34	Woodcraft	27
Educational Lumber Co., Inc.	35	The Princeton Co.	17	Woodline / The Japan Woodworker	37
Emco-Lux Corp.	38	Reese Design Group	17	Woodshop Specialties	29
Emperor Clock Co.	10	Rima Mfg. Co.	23	Woodworks	43
Equality Screw Co. Inc.	7	Rochester Institute of Technology	10	The Woodworkers' Store	30
The Fine Tool Shops Inc.	12	Rodger E. Timmer Co., Inc.	30	Working Wood	12
The Foredom Electric Co.	21	The Rockledge Co.	21	The Worcester Craft Center	15
Frank Hubbard Inc.	39	Rollingswood	5,29	The Xylophile's Co.	41
Frank Mittermeier, Inc.	21	Rudolph Bass, Inc.	39		
Frog Tool Co. Ltd.	4,31	Russ Zimmerman Woodturner	23		
Furniture Designs	41				

offer an alternative: paste wax, something most woodworking shops have on hand. Apply just a very little on the end of a screw. I use Phillips screws for a better grip, and insert them with a variable-speed hand-held drill.

I also use paste wax on both saw tables and fences, on the planer-jointer, the lathe ways and tool rest. You won't believe how easily wood will slip. It also prevents rust. It regularly goes on the handsaws, plane bottoms and Skil saw. And it won't stain your workpiece the way oil will....

—Frank N. Dana, Moira, N.Y.

I was amused by Thomas P. Sullivan's opposition to precision in woodworking (Jan. '81, p. 4). He didn't say what kind of woodworking he does, but if ⅛ inch is close enough for him, he is certainly not doing fine woodworking. For the rest of us, there are several perfectly valid reasons for seeking precision. First, even when we are only making things one at a time, cutting the parts accurately will enable them to fit together easily with minimum sweat. Second, for those of us who are trying to make a little money out of our woodworking—or at least use our time efficiently—a small production run is necessary for survival.

Most of the power tools used by individual woodworkers continue to depend on their owners to supply the brains. What these machines do for us is replace a lot of muscle power, save valuable time and (if properly adjusted and used) make possible a degree of precision that would require great care and skill to achieve with hand tools....

Boardman stated the case very well in his article in the Nov. '80 issue of *Fine Woodworking*. I feel sure that if you took a poll, most of your readers would opt for more, rather than fewer, articles dealing with increasing precision in our workshops. Another way of looking at it: my machines are my apprentices. They do my coolie labor for very low wages and are always available—even late at night or on Sundays.

—Lewis C. Cooper, Chester, N.J.

I find myself in agreement with Thomas P. Sullivan (Jan. '81). There has been a tendency lately toward articles and letters dealing with close tolerances and precision in machinery. I feel if that is what people want to have, they should read a publication such as "Fine Machine Tools" and let us have a few more articles about hand-crafting wood items. We who use hand tools don't worry about the "0.0005 tolerances" but gauge by eye and make our work pleasing to sight and touch.

—Paul A. Nichols, Fairfax, Va.

Allan J. Boardman's "Precision in Joinery" mentions that "...the dado head on your power saw cuts only in fixed increments that don't match your wood." Being another aerospace engineer (retired), I solved this problem by having our shop punch out several thin brass washers of various thicknesses. The washers are 1⅛ in. in diameter and are placed between dado blades to make up the exact thickness desired. Usually there is enough set in the dado blades (or overlap) to give a clean cut with the washers inserted. When there is not, the cut can be easily cleaned up with a chisel.

—Howard C. Lawrence, Cherry Hill, N.J.

Many of us are a bit ashamed to admit that we are only amateur woodworkers and not professionals. The definition of the word "amateur" might bring a better feeling about our

work. It's from the Latin word *amator,* meaning lover—one who practices any art or study for only the love of it.

—Randy Brown, Troy, Ala.

A suggestion on the jointer article by Tage Frid (*FWW* #19, Nov. '79, p. 92), for sharpening the knives, where he says to drill two holes in the bed and then drill holes in the metal strip to hold the blade: First drill and tap one hole in the bed and then drill one hole in the metal strip. Place the strip on the bed and tighten the screw, then drill the strip and bed at the same time, otherwise they will never match exactly and the nail set would never hold the strip tight and in place.

—Roy A. Meier, Altadena, Calif.

Re Floyd Verstl's suggestion on setting up a jointer (Jan. '81, p. 35), the knives should be at the exact level of the outfeed table, and that is very easily ascertained with the judicious use of a good straightedge. Why try to complicate it? And concerning Henry Teller's question on cleaning bowl bottoms (Jan '81, p. 28), again, why complicate matters? He states that he uses yellow glue, which is not too water-resistant. Place a wet sponge or cloth over the bowl bottom for a few minutes. Then take a scraper and do a bit of sanding, and the bowl's bottom is as pristine as a baby's.

—Charles F. Riordan, Dansville, N.Y.

In reply to the letters to the editor in reaction to "Decoration vs. Desecration" (back cover, *FWW* #24, Sept. '80), first of all I want to speak on behalf of the School for American Craftsmen. The school not only teaches its students techniques and skills, but also exposes the students to contemporary and traditional craftsmen and their work. I am thankful that the school has allowed students the freedom to take this information and use it to experiment and explore the material. . . . I have developed tremendous respect for traditional techniques in woodworking. I have an appreciation for furniture that incorporates and preserves traditional standards and techniques. I myself have taken advantage of the techniques I have learned and can see their strengths and merits.

But I have chosen to use wood in a different context and find it exciting to use other materials with the wood. It is my freedom of choice to do what I feel satisfies my personal motivations to use my hands and make a piece of furniture. Yes, my work is a means of personal expression. I think all of us articulate a little of ourselves through our work. That is what gives furniture its character. What I do to decorate my furniture is not any different from the early painted chests of the 1700s or the claw-and-ball feet of Chippendale chairs—it's all a form of embellishment. My pieces function (both visually and as furniture) quite well for me, and that is my goal in my work. *—Wendy Maruyama, Cookeville, Tenn.*

"The Patternmaker's Trade" (Jan. '81) is an excellent description of this rather complicated trade. It was mine 15 years after which I entered the model-builder status. Paul Suwijn has captured the fineness of patternmaking in its several-trades-in-one. I once made a pattern not much larger than an ink bottle, home desk size, that had a core print three times that diameter. The core box contained 27 pieces. Some had to be picked out using small tweezers. It was an inventor's effort to develop the windshield wiper with variable speeds. He provided a weekly update. I got between $25 and $29 for each,

pattern and core box, and 1937 prices for such items were competitively sought. Mine was a low-overhead shop. And there were some room-sized core boxes for huge forming presses, too. . . . —*D. Gerald Domes, Sun City, Ariz.*

Richard Newman's answer to Bob Guerrero (Nov. '80, p. 32) applies as well to more complicated designs. The overall design in the photo was assembled from tiles from four large pattern blocks, like the one in the foreground, and from three smaller blocks. This design is from a book for weavers of cloth and uses 16 species.

—*Ed Holroyd, Miles City, Mont.*

I was overjoyed to read the letter by Sian Newman-Smith (Sept. '80, p. 12) concerning our responsibility as woodworkers in the denuding of the world's forests. As a trained cabinetmaker aspiring to a custom furniture career, my involvement with the ecology movement, mainly through the National Audubon Society, has made me painfully aware of the mismanagement of our native forests and of the future being forged by the natural resource goliaths. . . .

Anyone who has visited North America's wildlands can witness dubious "management" practices. Why do the giant lumber companies clear-cut public lands with the approval of the state and federal agencies? Why are Indian reservations particularly exploited in this manner that ruins their watersheds, a main source of their economic support and tribal tradition? Why must virgin timber be cleared in areas where the topsoil is so fragile that it cannot recover from such destruction (i.e., the Queen Charlotte Islands, British Columbia)? Where are the black walnuts, beeches and white pines of pioneer days and what part does the modern-day farmer play in supplying local sawmills with domestic hardwoods (i.e., tree farming, selective cutting, clearing land for agricultural use)? When western red cedars are becoming an endangered species because they require 200 years to mature versus 40 years for Douglas fir, we can point to all the cedar-clad homes and redwood decks to explain to our children what has become of these magnificent trees.

What is happening to the Third World forests is not just a dilemma of creating agricultural lands for the emerging nations, greater profits for the multinationals, or the right exotic hardwood for that dynamite coffee table. What of the long-range consequences to the earth's atmosphere with the reduction of water vapor and increased carbon dioxide, which has been estimated to raise the earth's temperature by 3°, enough to create a desert out of the Midwest cornbelt?

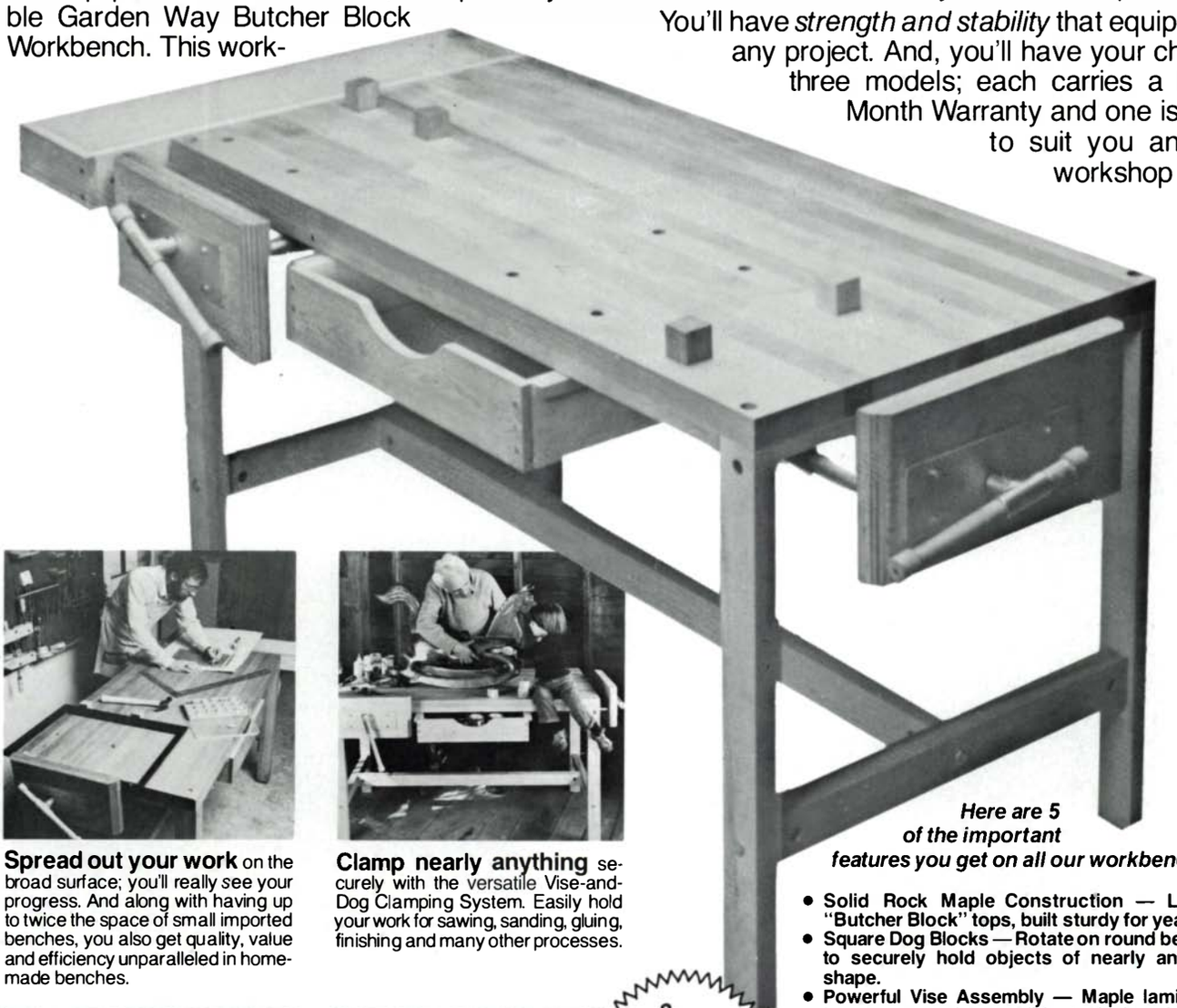
—*Kate Harrigan, St. Paul, Minn.*

EDITOR'S NOTE: For another view of forest management and wood use, see p. 87.

A couple of articles in recent issues of *Fine Woodworking* have dealt with dust-collecting systems. Someday I may build a good system. For the present I have a couple of substitutes, which are inferior but helpful and simple. I enclosed an ordinary floor fan in a framework that holds a large furnace

The Workbench That Completes Your Workshop!

Complement your investment in workshop tools and equipment with a full-sized, exceptionally stable Garden Way Butcher Block Workbench. This workbench is custom engineered to let you make the most efficient use of all your hand and power tools. You'll have *strength and stability* that equip you for any project. And, you'll have your choice of three models; each carries a Full 12 Month Warranty and one is bound to suit you and your workshop needs.



Spread out your work on the broad surface; you'll really see your progress. And along with having up to twice the space of small imported benches, you also get quality, value and efficiency unparalleled in home-made benches.

Clamp nearly anything securely with the versatile Vise-and-Dog Clamping System. Easily hold your work for sawing, sanding, gluing, finishing and many other processes.

Tackle any project with greater confidence when you can depend on this large, stable, handsome worksurface. Cabinetry, repairs, carving, kit building — all are far easier with the Garden Way Butcher Block Workbench.

Be assured of quality. Each bench is carefully hand-crafted from native Rock Maple components and solid steel hardware. Years of development, testing and rigid quality control enable Garden Way to offer you the bench that's won the praise of thousands of woodworkers.

Here are 5 of the important features you get on all our workbenches:

- **Solid Rock Maple Construction — Laminated "Butcher Block" tops, built sturdy for years of use.**
- **Square Dog Blocks — Rotate on round bench dogs to securely hold objects of nearly any size or shape.**
- **Powerful Vise Assembly — Maple laminate vise faces mounted on solid steel chassis' open a wide 8".**
- **Unique Rod-Nut Connections — Clamp all bench components together for sturdy assembly.**
- **Available options increase your workspace and working efficiency.**

3 MODELS TO CHOOSE FROM

Send today for **FREE COMPLETE DETAILS,** including all specs, prices and suggestions of how you'll put this bench to work for you.

Butcher Block Workbench
Garden Way Research, Dept. A 1019W
Charlotte, VT 05445

Please rush me Free, fully illustrated information packet with all the details on the Garden Way Butcher Block Workbench — the workbench that completes my workshop!

Name _____

Street _____

City _____ State _____ Zip _____

filter. When I am generating airborne dust, as in sanding, I set the fan near the work area but blowing away. This substantially reduces the dust in the air.

In addition, I have an exhaust system. The blower is from a junked clothes dryer. A length of flexible dryer hose permits me to draw air from immediately over the work area. I use it to remove solvent fumes rather than dust. It is not ideal, but it helps. I estimate that it draws 200 cubic feet per minute. If the temperature inside is 70° and outside is 20°, the heat loss is about 16,000 BTU per hour, which is tolerable.

A much larger fume-exhaust system would be desirable except for the heat loss. Does anyone have a practical scheme for a heat-recovery unit to transfer the heat from the outgoing to the incoming air? *—Reid Samuelson, Eastford, Conn.*

After many years of avid woodworking, I have developed allergic reactions to wood dust. Not just to a few of the exotic species but to the common domestic woods as well. Allergists were of little help—their solution was simply avoidance. Since woodworking is my primary source of income, complete avoidance is out of the question.

However, I have since learned that not breathing wood dust is possible to a large degree without undue loss of efficiency or pleasure in the process. I have attacked the problem from three directions:

—Produce less dust. Processes like belt sanding and hand sanding can be replaced with hand planing and scraping.

—Avoid airborne dust. Wearing a dust mask when working can be effective here.

—Contain the dust. Gather the dust as close as possible to the point where it is being produced. This can be accomplished with a central vacuum system and a dust collector custom-designed for each tool.

I have found that dust collectors for most machines must be designed and built by the woodworker. Surely this could be better accomplished by the manufacturer, with the collector being designed in rather than added on. In fact, however, few manufacturers make any effort in this direction. Also very little information is available to guide the woodworker in constructing his own. Admittedly, few woodworkers have my problem with dust, but is breathing any dust on a daily basis a good idea? I would greatly appreciate hearing from anyone with useful information in dealing with this problem.

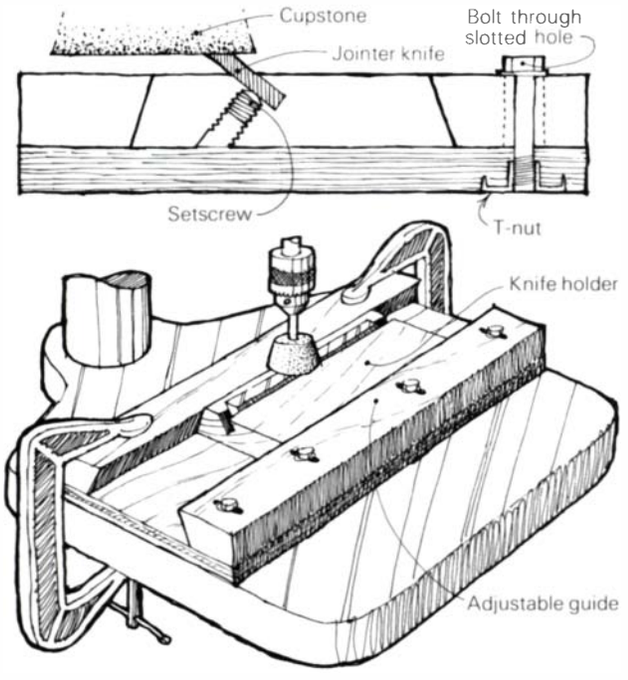
—Jeffrey R. Taylor, Mechanicsville, Md.

In response to Dick Soule's request for a milk-base liquid paint (Nov. '80, p. 38), an excellent imitation of the old milk-base paints can be made by combining powdered milk, water and acrylic artist's colors. Adding a small amount of white glue to the mixture will make it more waterproof. Providing that huge quantities of identical color are not needed, the home mixing method is ideal, as any color desired can be had. Do not add too much of the acrylic color, or a rubbery effect will result. Iron oxide powder from a potter's supply house comes in various shades of red, and is also a good colorant when combined with the acrylics; alone it is a little too gritty.... *—Tom Wisshack, Galesburg, Ill.*

ERRATUM: In *FWW* #26, Jan. '81, p. 68, we listed James A. Zerfing as a source for 18th-century style dials suitable for tall-case clock reproductions. His correct address is 123 Linden St., Williamport, Pa. 17701, not Lincoln St.

Improved knife-sharpening fixture

When I tried to adapt James Gier's drill-press jointer-knife sharpening fixture (Methods, *FWW* #23, July '80) to the small knives in my 8-in. jointer, I ran into several problems. The biggest problem was positioning a row of thumbscrews of sufficient size to hold the narrow knife so they wouldn't interfere with the cupstone. To solve the problems I modified Gier's design as shown below.



First I replaced the top-side thumbscrews with hex-head setscrews tightened from the bottom side of the sliding knife-holder block. Second, I beveled the edges of the block and the guide channel for a dovetail arrangement, so the block won't tip as it runs under the cupstone. I fastened the rear guide with bolts through slotted holes to T-nuts in the base, so the guide can be adjusted. If you want a really first-class fixture don't tap the wood. Rather use Rosann inserts (available from Constantine and others) to hold the setscrews.

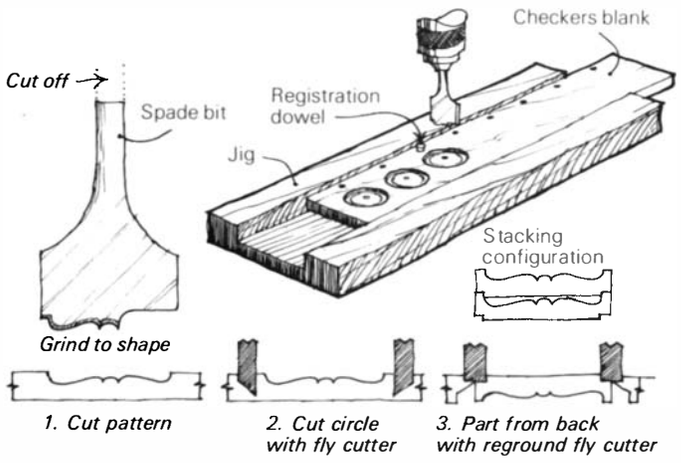
As Gier suggests, take extremely light cuts and preserve the setting of the first knife with the quill-stop. Take light cuts with the second and third knives until you hit the stop depth.

—Tom E. Moore, Springfield, Va.

Making wooden checkers

Here's my method for making wooden checkers on the drill press. First grind the point off a 1½-in. spade bit. Only one side of the bit cuts, so grind it to the shape shown in the sketch (next column, top) and sharpen. Grind the other side of the bit back so it won't touch. Next, make a wooden jig with a ¼-in. deep, 2½-in. wide channel as shown. Install a ¼-in. dowel near one edge. Clamp the jig to the drill-press table, aligning the dowel with the centerline of the chuck.

Use 2½-in. wide, 5/16-in. thick materal for the checker blank (I use walnut and maple). Drill ¼-in. registration holes along one edge of the checker blanks, making sure the holes are the same distance from the edge as the ¼-in. dowel is from the edge of the jig. Place the blank in the jig with a hole over the dowel. Set the drill press at its fastest speed and lower the bit ⅛ in. or so into the blank. You may have to experiment with depth to get the checkers to stack right. After shaping the top sides of all the checkers with the spade bit, use a fly cutter to cut almost through the blank. Grind another fly cutter so it will cut square, turn the blanks over and part the checkers with a shoulder as shown above. The shoulder of one checker should mate with the shaped cavity in the top of another for stacking.



—Larry W. Brewer, Roanoke, Va.

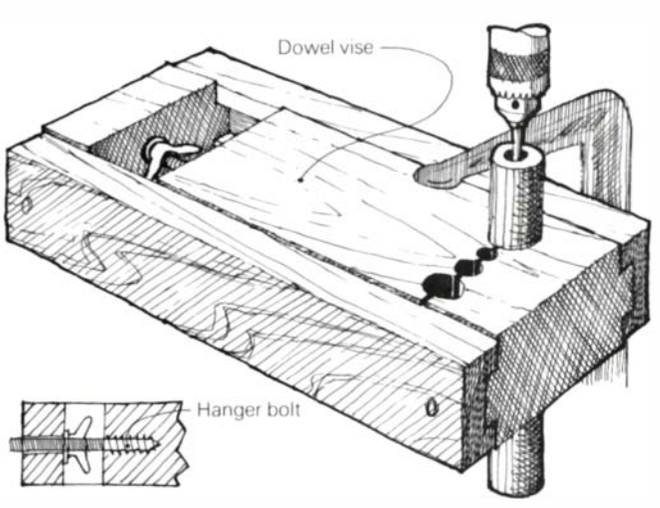
A vise for end-drilling dowels

This vise, shown in the sketch below, makes easy the awkward operation of drilling holes in the ends of dowels on the drill press. The vise consists of a thick wood block and a frame. The sides of the block are keyed to and slide in U-shaped slots in the frame. The block tightens in the frame by means of a hanger bolt screwed into the tail of the block and run through an oversized hole in the frame, as shown in the detail. The vise's jaws clamp the work when you turn a wing nut against the end of the vise frame. A washer at this point helps.

To make the vise, use a 2-in. thick hardwood such as maple or birch. Plane the sides of the frame a little thinner than the center block. This allows the sides to move easily when the center block is clamped in position on the drill-press table.

I use the vise to drill the holes for new ends on broken chair legs and spindles. The four holes in the vise jaws are sized to fit common chair parts (⅜ in., ½ in., ¾ in., 1 in.). To drill the vise-jaw holes, clamp a piece of ⅛-in. scrap in the jaws and drill the four holes centered on the scrap. With the scrap removed, the holes will be undersized so that the 1-in. hole will grip a 1-in. dowel.

—Leo Myers, Wellington, Ohio



Removing broken screws

To remove a broken screw, drill a small hole in the shank. Insert a copper wire in the hole to conduct heat, then heat the wire with a torch until the wood around the screw bubbles and smokes a bit. Quickly tap a tapered, square punch into

AMERICA'S 7 BEST POWER TOOL BUYS

1 8" TILT ARBOR SAW

8" tilt arbor saw crosscuts, rips, mitres, cuts compound angles, dadoes, coves, moldings. Less blade, motor. Rip fence for easy alignment $6.50 add'l. Ball bearing model $9.75 add'l. Takes 1/3 h.p. motor or larger, standard blades, attachments 23 lbs. f.o.b. factory **$49.60**

2 BELT SANDER
Changes from horizontal to vertical in seconds

Precision heavy duty sander includes a 4" x 36" sanding belt. Uses 1/3 h.p. or larger motor. V-pulley drive and multi-purpose drive spindle. Disc sander accessory, $14.50 add'l. Mitre gauge, $2.95 add'l. 18 lbs. f.o.b. factory. **$49.50**

3 4 FOOT WOOD LATHE
12" swing industrial size 3 speed pulley

Does the job of $150 unit. Tubular steel bed rails, screw action tail stock. Use any size motor. 4" face plate. $2.90. 30 lbs. f.o.b. factory **$64.00**

DELUXE HEAVY DUTY LATHE
Double shielded, lubricated for life ball bearings. 30 lbs. f.o.b. factory. **$75.00**

4 LONG BED WOOD LATHE

55" version of the deluxe heavy duty lathe, has ball bearing live center in tail stock and extra heavy bed tubes. 40 lbs. f.o.b. factory **$89.00**

HIGH SPEED TURNING CHISELS { Set of 3, $8.50 / Set of 8, $23.00

5 JOINTER-PLANER

4" x 22" Cast iron and steel, precision ground adjustable tables. For planing, joints, bevels. Cuts to 1/8" depth. Fence adjusts from 0° to 50°. Steel knives and dual guards. Use any motor. Precision ball bearing industrial model. $14.65 add'l. 19 lbs. f.o.b. factory **$59.85**

6 32" RADIAL DRILL PRESS

Precision 32" radial unit has standard features and many extras. Depth of throat up to 16". Head tilts and table stays level. Drills to center of a 32" circle. Cast iron and steel. Less motor, belt and pulley. 30 lbs. f.o.b. factory **$89.90**

7 WOOD SHAPER KIT

Makes beads, coves, moldings, tongue-and-groove joints. Accurate at high speeds. Sealed and greased for life ball bearings. Less wood. Takes ¼ h.p. motor or larger, standard cutters. Optl., hold down assem., $4.50 add'l. 6 lbs. f.o.b. factory. **$39.90**

These power tools have no chrome, embossed nameplates or any other useless extras . . . but they do the same job as tools costing 2 to 3 times the price! And their performance has been proven in the shops of literally millions of professionals and serious amateurs.

Don't be misled by AMT's low prices; these are quality tools. They are full scale, full speed and offer top performance and precision. There are good reasons why we are able to offer such values. Here is how we do it:

Engineered for simplicity: After years of engineering refinements, virtually all the frills have been eliminated in order to save you money. **Faster machining:** Specially designed automatic machining equipment cuts costs by cutting production time. **Standard parts:** Ordinary hardware items replace custom parts for enormous savings.


Volume: Our own foundry, our huge mass production facilities and our large buying power—all keep costs down. **Direct factory purchase:** You pocket the savings but we still offer our two terrific guarantees!

POWER SAW: Our tilt arbor saw comes completely assembled with ground cast iron table, safety guard, splitter and mitre guage.

In addition you get a free set of cabinet base plans that show you how, with one sheet of 3/4" plywood, you can convert this saw into a floor model with a big 27" x 24" top. Cabinet rip fence only $7.50 additional. And you can use your new saw to cut out the cabinet base!


BRAND NEW GE ELECTRIC MOTOR
Develops a full 1 h.p., 17 lbs. f.o.b. factory. (purchased separately $49.85) $44.80.

AMT OFFERS TWO GUARANTEES:

OUR 10-DAY MONEY BACK GUARANTEE
Try any of these power tools and compare it with any similar machine at any price. If not satisfied return it for prompt no questions asked refund! We pay the return shipping charges.

10-YEAR FULL SERVICE GUARANTEE
Any part or parts of these AMT power tools (except motor which carries a one year gaurantee) which becomes inoperative for any reason within 10 years after purchase date will be repaired or replaced by the factory with no charge to the purchaser other than postage.

AMERICAN MACHINE & TOOL CO., 4TH AND SPRING STS., ROYERSFORD, PENNSYLVANIA 19468

BUY DIRECT . . . USE THIS HANDY ORDER COUPON TODAY

AMT

American Machine & Tool Co., Dept. FW31 , Fourth & Spring Sts., Royersford, Pa. 19468
Please send me the units checked. Payment in full enclosed $ _____ or $5 deposit each item enclosed, balance C.O.D. I must be fully satisfied or will return unit within 10 days for full refund. No questions asked.

1 ☐ 8" tilt arbor saw, $49.60
☐ Standard rip fence, $6.50
☐ Long cabinet rip fence, $7.50
☐ Ball bearing spindle, $9.75

2 ☐ Belt sander, $49.50
☐ Disc sander attachment, $14.50
☐ Mitre gauge for sander, $2.95

3 ☐ 12" swing, 4' lathe, $64.00
☐ Deluxe ball bearing lathe, $75.00
☐ Face plate, $2.90

4 ☐ Long bed wood lathe, $89.00
☐ Face plate, $2.90

Turning chisels for any lathe
☐ Set of 3, $8.50
☐ Set of 8, $23.00

5 ☐ Jointer-planer, $59.85
☐ Ball bearing spindle, $14.65

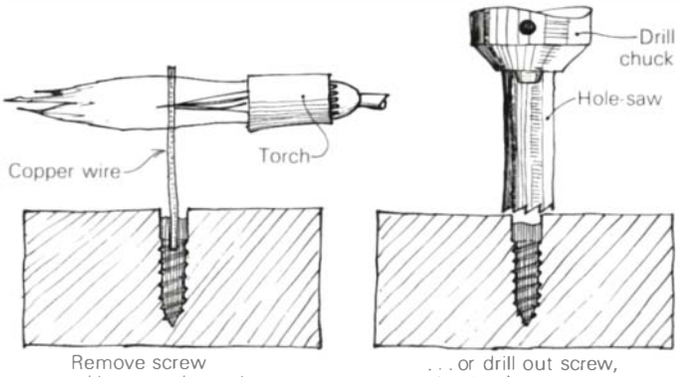
6 ☐ 32" radial drill press with tilting head, $89.90

7 ☐ Wood shaper kit, $39.90
☐ Optional hold down kit, $4.50

General Electric Motors
☐ $44.80 (with other item)
☐ $49.85 (purchased separately)

Visit our Royersford factory showroom for these same low prices. 4th and Spring Sts. From 9 to 4:30 on weekdays and 9 to 12 on Sat.

NAME
ADDRESS
CITY STATE ZIP



the hole and back out the screw. The heat liquefies resins in the wood and makes removal easier. Properly done, the procedure does not damage the hole, and another screw the same size may be used.

If the heat procedure doesn't work, drill out the broken screw with a tubular hole-saw just large enough to slip over the screw shank. Make the hole-saw by filing several coarse teeth in the end of a short section of thin steel tube. Drill out the broken screw, then glue in a plug to fill the hole.

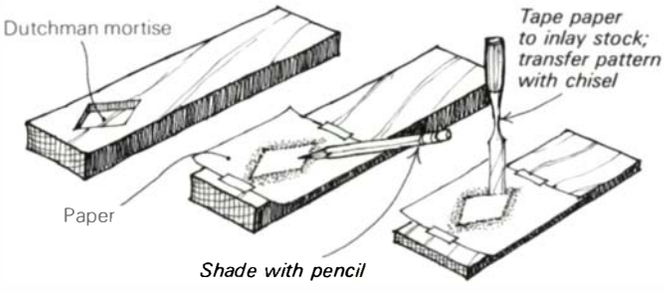
—Jerry C. Blanchard, Carmel, Calif.

Cutting a dutchman

"Dutchman" is the name given to an irregularly shaped inlay that's used to repair a blemish (such as a cigarette burn) in woodwork. Typically the woodworker cuts the inlay first, traces its outline on the stock and cuts the shallow mortise to fit. Here's an alternate approach that allows you to cut the mortise first or match an existing mortise. I'm sure the technique could be applied to marquetry work as well.

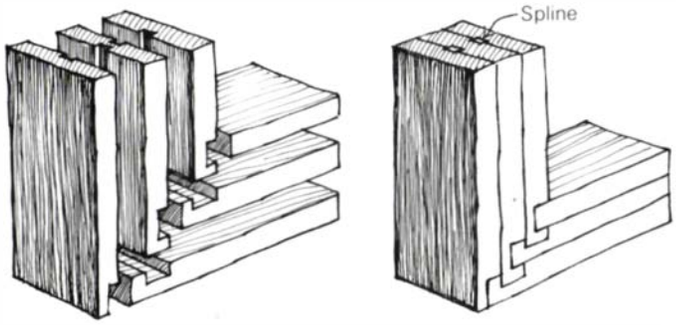
Lay a piece of paper over the mortise and shade the area around the mortise with the flat of a pencil (sketch, below). The edges of the mortise will stand out sharply. Tape the paper to the dutchman stock and transfer the pattern to the stock with a chisel and mallet. Remove the paper, cut out the dutchman and you should have a perfectly fitting inlay.

—Donald M. Stevens, Mansfield Center, Conn.



Greeno interlock joint

The development of a genuinely new wood joint is worthy of notice. In the shop of Jerry Green, the furniture maker with whom I apprenticed, we often worked with a tropical wood called partridge wood. Dramatic color made the wood popular, but it was prone to checking and honeycombing in thicker dimensions. Green's designs, nevertheless, frequently called for 2-in. and thicker material, so we laminated ¾-in. stock. Capitalizing on this, Green invented this highly deco-



rative, extremely rigid and (since it requires only one setup) easy-to-machine joint. Because the joint is self-locking, it must be assembled while laminating. After the glue sets, scrape and belt-sand the surfaces. To register the laminated boards we often added splines, as shown in the sketch.

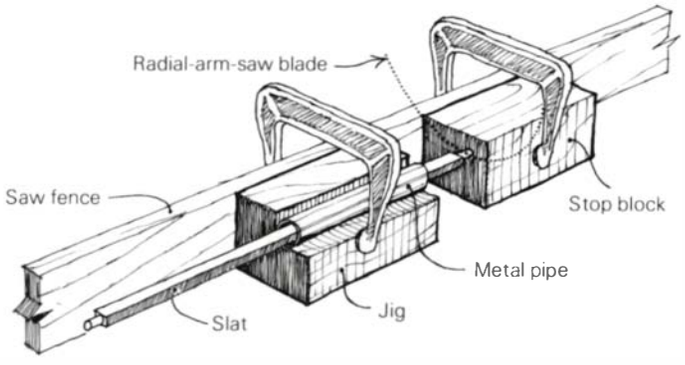
In memory of its inventor we came to call this joint the Greeno interlock joint.

—John W. Kreigshauser, Kansas City, Mo.

Cutting round tenons on slats

With a metal pipe, a simple jig and my radial-arm saw, I solved the problem of cutting round tenons on the ends of slats for the sides of a cradle. Find a 6-in. length of pipe that slips snugly over the slats (my slats are ¾ in. wide by ⅜ in. thick). Add masking tape to the slats to tighten up the fit if they're loose. Build the simple jig shown in the sketch at right and clamp it and the stop block to the saw's fence. Carefully adjust the stop block so that the tenons will be the right length. Mount a sharp plywood blade in the saw and center the blade over the slat location. Now push a slat into the pipe and place the pipe in the jig with the slat up against the stop. Lower the blade until it just touches the flat side of the slat (this will result in a slightly undersize ⅜-in. tenon). Rotate the pipe to cut a clean shoulder on the slat. Work the pipe back and forth under the blade, slowly rotating the pipe. A round tenon will result. This process leaves the tenon a little bit rough, but so much the better for gluing. After you're set up, you can cut the tenons on 20 or 30 slats in an hour.

—George Eckhart, Kenosha, Wis.



Chair-rung tenons on the bandsaw

Here is an easy method of using the bandsaw to make tenons on round pieces such as chair rungs. Take out the saw's miter gauge, put it in backwards (with the face toward you) and clamp it to the table with a C-clamp. Position the gauge so that its face is the same distance from the cutting edge as the depth of the desired shoulder on the tenon. Deep shoulders

Forstner Bits-
A Good "Bit" Better!

Almost unknown in America, Forstner bits are the most accurate and versatile of all woodbits.

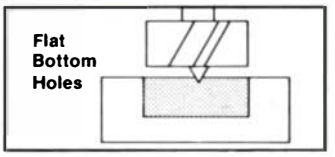
With your Forstners you can drill flat bottom holes, or bore **clean** holes in thin stock or veneers. . . and even end grain. They easily enlarge existing holes.

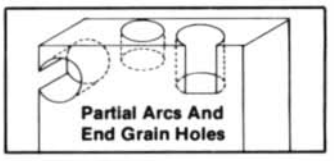
Since Forstners are guided by their outer edges, you can bore any arc of a circle; hence even ovals or curved openings. . . either flat bottom or thru. . . and the hole sides are glass smooth! Because of their design, they won't move off center even through irregular grain or knots.

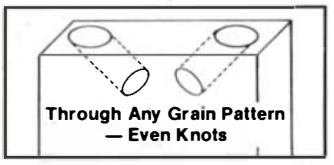
When rabbeting or grooving, drill holes of exact width and depth first, to cut down on chisel work and prevent splitting. Thru-holes for door locks or blind holes for plugs above countersunk screws are a breeze. Great for pocket holes to attach rails to tops.

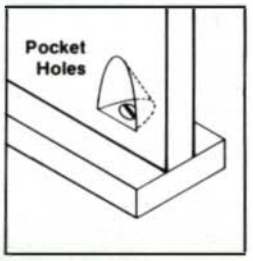
Very high Austrian quality; carbon tool steel. Primarily used in drill presses or stands, they can be used in any portable drill with a 3/8" or larger chuck. All bits are 3½" long.

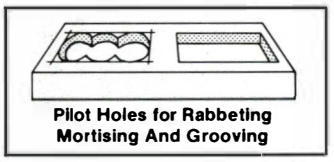
Backed by our 30 day money back guarantee.











Plans for the bit caddy included with your Forstner bit order.

You Can Order Tools By Phone:

Call TOLL FREE 800-321-6840
Ohio Residents Call: (216) 831-6191

INDIVIDUAL FORSTNER BIT PRICES

FB38 -	3/8" Bit.....	**$10.50**
FB12 -	1/2" Bit.....	**$11.50**
FB58 -	5/8" Bit.....	**$12.95**
FB34 -	3/4" Bit.....	**$14.50**
FB78 -	7/8" Bit.....	**$15.75**
FB100 -	1" Bit.....	**$16.95**
FB118 -	1 1/8" Bit.....	**$18.50**
FB114 -	1 1/4" Bit.....	**$19.95**
FB138 -	1 3/8" Bit.....	**$20.95**
FB112 -	1 1/2" Bit.....	**$24.95**
FB158 -	1 5/8" Bit.....	**$25.95**
FB134 -	1 3/4" Bit.....	**$27.95**
FB178 -	1 7/8" Bit.....	**$29.95**
FB200 -	2" Bit.....	**$31.95**

BUY IN COMBINATIONS AND SAVE

FB600 - 6 Pc. Set: 3/8, 1/2, 5/8, 3/4, 7/8, 1"
(Save $23.15) **$59.00**

FB411 - 4 Pc. Set: 1 1/8, 1 1/4, 1 3/8, 1 1/2"
(Save $16.35) **$68.00**

FB422 - 4 Pc. Set: 1 5/8, 1 3/4, 1 7/8, 2"
(Save $21.80) **$94.00**

FBS14 - Complete 14 Piece Forstner Bit Set
(Save $46.00) **$175.00**

LEICHTUNG INC
"THE Workbench People"
4944 Commerce Parkway #381 FW
Cleveland, Ohio 44128

Yes Ric Leichtung, please send me:

How Many	Item Number And Description	Price Each	Total Price

Net Amount of Order	
Shipping, Handling, and Insurance	$1.75
Ohio Residents Add 5½% Tax	
TOTAL	

Method of Payment
□ Check Enclosed □ VISA □ Master Charge

Card #_____ Good Thru_____

Name_____

Address_____

City_____

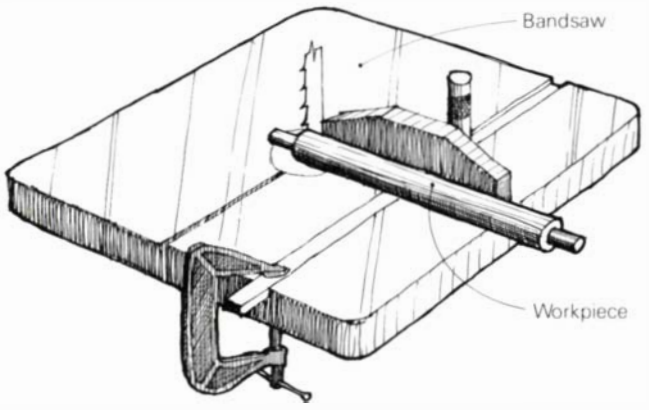
State_____ Zip_____

LEICHTUNG'S 1981 Fine Tool Catalog

□ Here's my order for Forstner bits. As my BONUS plese send your 84 page, 1981 color catalog of hard-to-find woodworking tools, PLUS all catalogs and bulletins. . . **FREE**. . . FOR THE NEXT TWO YEARS!

□ Enclosed is $1.00. Please send your 1981 color catalog PLUS all catalogs and new tool bulletins FOR THE NEXT TWO YEARS!

LEICHTUNG INC
"THE Workbench People"
4944 Commerce Parkway #381 FW
Cleveland, OH 44128 • Phone 216-831-6191



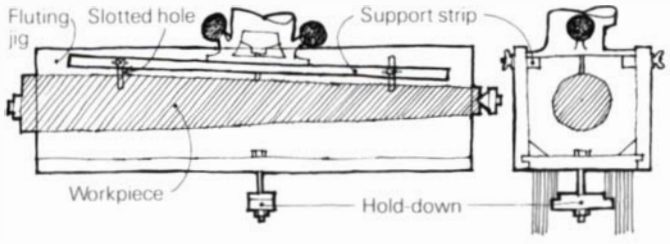
may require two or three passes. With the saw on, rotate the workpiece against the face of the miter gauge. Done properly, the result is a smooth, properly sized tenon.

—George Kramer, Santa Rosa, Calif.

Fluting jig

This jig routs accurate and consistent flutes on tapered turned legs. The jig is a U-shaped plywood channel as wide as your router base, mounted to the lathe bed. Dimensions will vary according to your router base and the peculiarities of your lathe bed. Attach two router-support strips to the inside of the jig with bolts and wing nuts through slotted holes so the strips can be angled parallel with the tapered leg.

To use the jig, first turn all legs to shape, then mount the jig to the lathe bed. Chuck one leg between centers, locking it into position with the index head. Now set the router-support strips parallel with the turned workpiece. To do this, simply set a board (as wide as the interior of the jig) on the work and tighten the support strip's wing nuts with the strips resting on the board. Remove this adjustment board and fasten stops to the support strips so each flute will be the same length. Now you're ready to rout the flute. Use the holes in the lathe's indexing head for accurate spacing of the flutes around the leg. *—John Sanford, Camden, Maine*



Cutting wooden threads

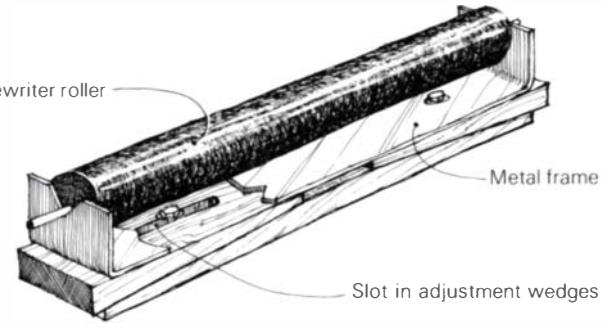
To cut perfect wooden threads, immerse the dowel in hot paraffin for ten minutes prior to threading. Thread while the dowel is still warm. The shavings roll out of the die in a neat string, leaving a perfect thread base. The method works even on hard-to-thread woods like oak.

—Al Grendahl, St. Paul, Minn.

Refinements on the roller support

The heart of my roller horse for supporting long stock off the table saw, radial saw or jointer is a worn-out typewriter platen. These are available, often just for the asking, from typewriter service shops, and they stay truer than wooden rol-

lers, an advantage particularly for jointer-feed support. The wedges between the roller carriage and the horse allow for fine height adjustment. *—D. Kerman, Swampscott, Mass.*



Glue spreaders

For years I had trouble spreading just the right amount of glue on the edge of boards. Fingers are messy, brushes get hard and the glue bottle's applicator leaves blobs. Recently I discovered that a short, thin piece of scrap will even out the glue perfectly. The sticks work so well it's worth cutting a supply of the 5-in. long, ⅛-in. thick, ½-in. wide applicators to have on hand. *—Jon Gullett, Washington, Ill.*

The old familiar popsicle sticks work well for spreading glue. These inexpensive sticks are available in large quantities from craft stores or from restaurant suppliers as coffee stirrers. *—Larry Joseph, Alva, Okla.*

The best tool I've found for applying glue is a small, flexible artist's palette knife. *—Phil Loomis, Enfield, N.H.*

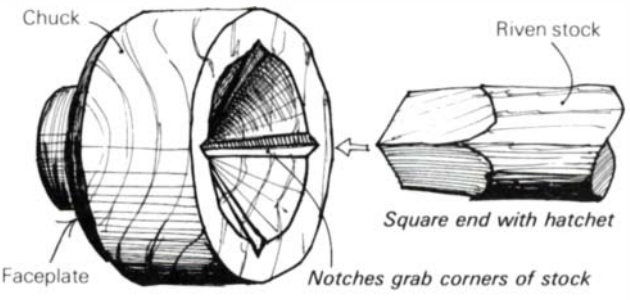
Chair-rung chuck

In the Southern Appalachian mountains we turn dowels and rungs from stock that's been riven with a froe, then cleaned up with a hatchet or drawknife. With the device sketched below, you can quickly chuck the rough stock in the lathe.

To make the chuck, screw a 1½-in. thick hardwood block to a small faceplate. Turn the block to a 3-in. cylinder with a cone-shaped depression in the face, as shown in the sketch. Stop the lathe and with a V-parting chisel cut four ⅛-in. deep grooves in the walls of the cone 90° apart to grab the corners of square stock.

Prepare the stock to be turned by giving it four quick licks with a hatchet to cut a short, square section on one end. With the square end of the stock in the cone, tighten the lathe's tailstock on the other end and you're ready to turn.

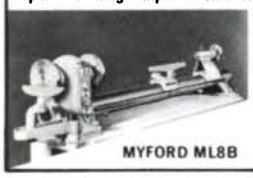
—W. W. Kelly, Clinton, Tenn.



Methods of Work buys readers' tips, jigs and tricks. Send details, sketches (we'll redraw them) and photos to Methods, Fine Woodworking, *Box 355, Newtown, Conn. 06470.*

WOODTURNING SCHOOL

Beginners and experienced turners are invited for two-day workshops offered throughout the year. With a maximum of two students, learn and practice bowl and spindle turning--emphasis on cutting techniques.



While here you will use the Myford Lathe which we import from England and stock for sale.

45¢ IN STAMPS FOR FULL DETAILS

RUSS ZIMMERMAN
RFD 3, BOX 57A
PUTNEY, VERMONT 05346

HAVE WE GOT A PLAN FOR YOU!

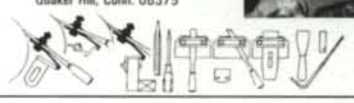
Select from 115 plans and patterns for do-it-yourselfers to make a wide variety of useful and delightful items, including furniture, toys and outdoor projects. Order your Craftplans catalog today. Send **50¢** to:

CRAFTPLANS, Rogers, MN 55374

NEW MODEL #FW3
HANDY SHARPENING JIG

Anyone can do it with this jig. Money back guarantee. Perfect hollow ground bevels on blades to 2½" wide. Aluminum cons't. brass screws. Only 4¼ ozs. $9.50 ppd. ck. or m.o. only.

RIMA MFG. CO.
P.O. Box 99
Quaker Hill, Conn. 06375



SCHOOL OF

CLOCK REPAIR & RESTORATION

Learn Clock Repair
Earn Money At Home
Enjoy A Fascinating Hobby

Comprehensive Home Study Course

For Full Details, Complete Brochure, Course Outline, Registration Information, Etc., Send $1.00 (Applicable to Enrollment Fee) To:

School of Clock Repair
Squire Village
7 Cambridge Court, Rm. 1
Toms River, New Jersey 08753

APPROVED BY THE COMMISSIONER OF EDUCATION, STATE OF NEW JERSEY

BUILD YOUR OWN POWER TOOLS

METAL PARTS KITS AT LOW FACTORY DISCOUNT PRICES FOR:

SAVE $50 TO $500

- 12-IN. BAND SAW
- 18-IN. BAND SAW
- 10-IN. TILT/ARBOR SAW
- COMB. DRILL PRESS-LATHE
- 9-IN. TILT TABLE SAW
- 6-IN. BELT SANDER
- SPINDLE SHAPER

PLANS Full-Size Patterns $3.00 per plan Deductible

81,000 in use.

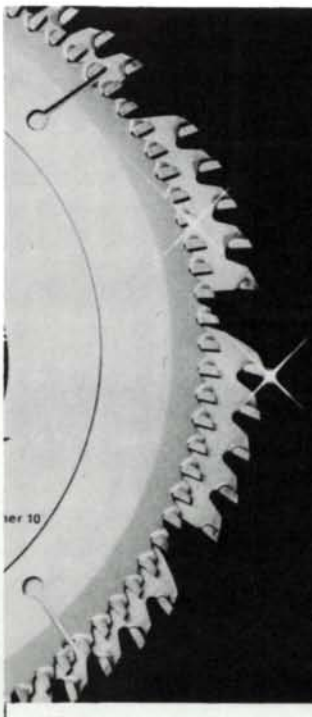
Sold for 34 years

KITS FROM $34.99 to $139.99

Featured in Workbench, Popular Science, Mechanix Illustrated. No machining, no welding. **5-year full service guarantee**. Step-by-step plans, photos, full-scale patterns show how. Send $3.50 each (postpaid) stating tool plans wanted. Catalog included. Or, send 50¢ for Catalog

GILLIOM MFG., INC. Dept. FW-3; St. Charles, Mo. 63301

CARBIDE OUTCUTS THE REST



Do your best work with carbide tipped blades from the leading manufacturer...Vermont American. The top choice of professionals everywhere. These hard chrome finish blades are made for extremely long life and smoothest cutting in woods and composition materials. May also be used in soft metals.

60 and 100 TOOTH THIN RIM
Special grinding process for tip clearance (teeth have no set) gives extremely smooth finish - practically eliminates sanding. The ultimate blade for fine finish work and cabinetmaking.

50 TOOTH MASTER COMBINATION
This quiet, cool running blade cuts freely and fast with and across grain. Produces an unusually smooth finish for an all purpose blade. This raker tooth type blade will be the most popular blade in your shop.

Indicate blades desired:

Blade type	Teeth	Dia-meter	Price	Part No.	Quantity ordered
Thin Rim	60	9"	$60.50	M509	
	60	10"	66.50	M5010	
	100	10"	94.95	M5110	
	100	12"	104.95	M5112	
Master Comb.	50	9"	49.50	M529	
	50	10"	49.50	M5210	
	50	12"	54.50	M5212	

VERMONT AMERICAN
HAROWARE TOOL DIVISION
LINCOLNTON, NORTH CAROLINA 28092

ORDER DIRECT FROM HAWK INTERNATIONAL

Signature _____
Name _____
Street _____
City _____ State _____ Zip _____

___Enclosed is a check for $ _____
(N.C. residents add 4% sales tax)
___Please charge my ( ) Master Chg.
( ) Visa. Acct: No. _____
Exp. date: Mo._____Yr. _____

HAWK INTERNATIONAL INC.
P.O. BOX 3525
HICKORY, N.C.

If you thought "Swiss-Precision" could only be found in watchmaking, then you don't know about our power tools.

Only you know how good your tools have to be. When it comes to woodworking machinery, they should be better than you are—even if you're already an accomplished craftsman. Therefore, you owe it to yourself to learn more about our Swiss-made line of INCA stationary power tools which we sell throughout these 50 states.

Take the 10" Cabinetmaker's Saw, for example. It has a 20mm (25/32") arbor at the blade for strength and rigidity where it counts. The table castings are tough, precision milled alloys and the guide rails are aircraft quality extrusions. All the major rotating parts are dynamically balanced. The bottom line is a machine that takes higher loadings and gives you less vibration with a truer running saw blade.

If fact, every one of our INCA saws, jointers, planers and shapers are built to quality standards which are becoming increasingly hard to find in this country. That's because they're made with the same pride of workmanship as the Swiss put into their watches.

Our catalog is a good place to begin your comparisons. We want you to be as good as you can get.

Garrett Wade Co., Dept. FW-3-81
161 Ave. of the Americas, N.Y., N.Y. 10013

National Sales

Gentlemen:
☐ Send me your INJECTA INCA catalog. Enclosed is $1
☐ Here's another $1 for your 116 page catalog of quality hand tools.

Name _____
Address _____
City _____ State _____ Zip _____

EDITOR'S NOTE: Many readers have written us asking for information about how to get a good lacquer finish on rosewood and other resinous species that resist the best efforts of the finisher. We were unable to find a satisfactory answer to the problem until one of our readers told us about the method used by Martin Guitar Co. in Nazareth, Pa. We got in touch with the people at Martin, and Dick Boak, a luthier and manager of Martin's 1833 Shop, kindly agreed to share their technique. Says Boak:

Craftsmen often have difficulty finishing exotic woods like cocobolo, rosewood and other related species. Because these woods are high in natural oils, problems with drying, crazing, clouding, lacquer checking, "peanut-shell" adhesion and bleeding often arise. The C.F. Martin Company, whose guitars incorporate exotic woods, has developed a solution to these problems. Years of experimentation (and experience) have led to a lacquer finish that is thin, flexible and durable—actually improving the tone of the instrument with age. Although the procedure I'll describe here is used specifically for guitars, it will work as well on other pieces made from highly resinous exotic woods.

We have our finishing materials formulated by Sherwin-Williams Co. to meet our specific production needs. Sherwin-Williams sells equivalent products in its retail stores, and these will give you similar results. So I'll list two stock numbers for each material—the first for the special-formula product, the second for the standard retail item.

The finishing room must be dust-free and well ventilated. Martin uses waterfall-type spray booths (made by Eisenmann in West Germany), which trap overspray particles in the air, prevent those particles from settling on the work and reduce the danger of explosion (always a risk with nitrocellulose products). We also use explosion-proof mercury-vapor lights in the finishing area and keep spark-producing devices away. A temperature of 72° F and a relative humidity of 45% are ideal for the wood. During hot, humid months we add a retarder (Sherwin-Williams #R6-K22, #R7-K27) to the lacquer in minute amounts to keep the finish from clouding. During the winter we use humidifiers to reduce static electricity, which causes particles to stick to the work. The irritating and volatile dust produced by sanding between coats must not be allowed to settle back on the work, so we use an efficient dust-collection system to keep the air clean.

To prepare for finishing, sand the surfaces with 180-A paper and then scrape along the grain, removing any scratches left by sanding. Mask any areas not to be finished. Now spray on a coat of vinyl washcoat (Sherwin-Williams #T69-CH6, #T69-F2), making an extra pass over the seams and any inlaid parts. The vinyl washcoat, the key ingredient in the process, seals in the wood's natural oils and serves as a base for the wood filler. After this application cures for at least two hours, abrade the surfaces lightly with a scuff pad (Norton Beartex Pad) or sand lightly with 400-A aluminum-oxide paper. Now the wood is ready for filling.

Martin uses a silica-base filler (Sherwin-Williams #D80-NH46, #D70-T1), which thins with naphtha and mineral spirits. We use it on all porous woods (rosewood, mahogany, cocobolo, zebrawood and others) to provide a uniform base for the lacquer. This filler is syrupy, and you apply it with a brush. It gets leathery after about five minutes, at which point you rub it into the pores of the wood with a cotton rag tied into a bun. Then carefully remove the excess. After filling, fine-sand the spruce top; then wet the top with water to raise the grain, let dry and finish-sand.

Apply another full coat of vinyl washcoat to the top; when it cures, sand it lightly with 400-A paper. Scrape the bindings with a sharp tool to restore their original color, which will have been muddied by the filler. Spray a final coat of vinyl washcoat over the entire body and let it cure for at least two hours. Then spray on a coat of lacquer sealer (Sherwin-Williams #T61-C10, #T60-F10), which must cure for a minimum of 30 minutes (sand the surface if it sits overnight) before the first coat of gloss lacquer is applied. The same day, spray on two or three wet coats of gloss lacquer (Sherwin-Williams #T71-C10, #T77-F12), allowing 45 minutes drying time between each coat. (The special-formula lacquer is sprayed at 110° F, using heated hoses.) Sand the surfaces lightly the next day with silicon-carbide paper (280-A), taking care not to sand through the lacquer into the sealer coats. Apply another two or three coats of gloss lacquer, depending on the coarseness of the grain, waiting 45 minutes between. Sand again the next day, and apply two more full coats, making six coats in all. Leave the final coat unsanded.

Where inlaid surfaces like the bindings and rosettes have been scraped, you might need to build these back up by applying lacquer with a small brush. We call this process dropping-in, and use lacquer of thicker consistency for this purpose. Let the dropped-in areas dry, and then sand lightly to level them with the surrounding surfaces. Because the spruce top is non-porous, it requires only four coats, with only one light sanding between the second and third coats. A thin film on the top improves the tone of the instrument, and will be less prone to cold checking. The fingerboard, by the way, receives no finish, except for a rubbed-in application of lard oil (animal-fat shortening).

To get a flat finish, the final coat is sprayed on using a 50/50 mix of gloss and flat lacquer (Sherwin-Williams #T71-FC3, #T77-F13) and left unbuffed. Gloss surfaces are buffed with a lamb's-wool bonnet and buffing compound (3-M #A5955) thinned with water. Buffing removes the "orange peel" (minute dimples) and yields a highly polished surface. A final buffing at a high RPM removes all the scratches left by the compound and completes the finish. At this point the guitar can be assembled. The area on the top where the bridge must sit is scribed, scraped and tooth-planed to make a good wood-to-wood glue joint.

Lacquer films are not as hard as polyurethane or other catalyzed finishes, and lacquer-finished surfaces should be protected from abrasion and abusive treatment. When placed in direct contact with plastic and vinyl, the vinyl washcoat can soften and migrate, so plastic or vinyl straps are strongly discouraged. Also the salts and acids contained in human perspiration can erode the finish over an extended period of time, and refinishing may eventually become necessary.

Touch-up aerosol cans of vinyl washcoat, lacquer sealer, gloss lacquer and flat lacquer, as well as walnut-colored filler, buffing compound and polish, are available through Martin's 1833 Shop. For information write C.F. Martin Co., 510 Sycamore St., Nazareth, Pa. 18064.

With a glue-joint cutter on my spindle shaper, I'm having difficulty setting it properly so the boards come out flush. How can I match the center of the cutter with the center of the boards? I can get real close, but never exactly right on the first time. —*John T. Schulte, San Rafael, Calif.*

Depending on the initial flatness of your stock, there are several steps required to prepare the individual boards for the process. First, rough-rip all boards to a maximum width of 3½ in., and then joint one edge. Next, joint one face on each board and then run them all through the planer, jointed face down, for a net thickness of 1⅜6 in. Lastly, table-saw the unjointed edges square.

Now you're ready to cut the glue joints. Proper alignment

FINE HOMEBUILDING

The New Magazine About Building and Rebuilding Houses.

You're Invited to Become a Charter Subscriber.

Dear Fine Woodworking reader:

Just as a void existed for the serious woodworker when we started Fine Woodworking magazine five years ago, so does a void exist for the serious homebuilder and renovator today.

There has been no magazine that covered the whole broad and vital field of homebuilding with quality, style and depth. So we at The Taunton Press have started a magazine that does just that, and we've called it *Fine Homebuilding*, because that's what it is about.

Fine Homebuilding deals with both new and old construction techniques, and also with design. The emphasis is on "fine"—well done, but not necessarily expensive—and the magazine is written by people in the field who know their subject well. It covers everything from site preparation to interior-wall finishing, with equal emphasis on additions, renovations, restorations and new construction.

A lot is happening today in this age-old field (solar is just one small facet) and we intend to tell you all about it, not only because it's interesting, but also because we think this information will help you with your own homebuilding needs.

Fine Homebuilding magazine is being published bimonthly and has the same size and feel (but not the same look) as Fine Woodworking, and of course the same commitment to technical and visual excellence.

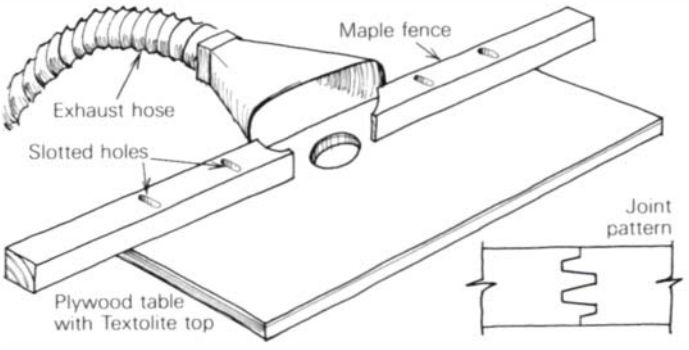
The first issue of *Fine Homebuilding* came off the presses January 15th, and we're excited about it. If you are, too, you can become a Charter Subscriber.

A one-year subscription is $14, a real bargain for the amount of useful information you will receive, and a saving of $4 over the newsstand price. Besides, newsstand sales are limited, so you should subscribe to be sure you see it. Just send your payment in the convenient order form enclosed in the magazine, or use the address below. Of course, if you're not pleased with the first issue, we'll be happy to refund in full.

—Paul Roman, Publisher

The Taunton Press 52 Church Hill Road, Box 355, Newtown, CT 06470

of the shaper fence is critical, so to facilitate fast and accurate setup, we designed a fence and table fixture (illustrated below), which bolts onto our shaper table. The fixture is constructed from Baltic birch plywood with a Textolite surface and hard maple fences. The bolt holes in the fences are



slotted for maximum adjustment. Once the fences are correctly aligned and locked into position by means of the bolts, the entire fixture can be unbolted, removed from the shaper and replaced without disturbing the original setup. Final adjustment of the fence to the cutter is done by tapping gently with a rubber mallet.

Even with this fixture, there is considerable fooling around before the joints start coming out right. We use a 4-wing carbide cutter made by Leitz of Germany, and we have found that to get precise, crisp cuts the chips must be removed by a vacuum hose attached to the collection head. The stock is fed by a Forest City 3-roll automatic feeder set on its slowest speed. We test each joint for tightness right off the machine. After use the fixture is stored in a dry place. —*Dean Santner*

How can I increase the life of my sanding belts? It's a shame that most of them get gummed up before the grit is dulled.
—*Thomas M. Kaplan, Roanoke, Va.*

Clogged sanding belts overheat and wear out too quickly. Many tool catalogs feature belt cleaners or dressers that offer to prolong belt life up to ten times. They do, but those cleaners are themselves quite expensive. You can do as well for less money by commandeering your spouse's, children's and neighbor's old rubber-sole shoes. Those belt cleaners are really blocks of the same crepe rubber that's on the bottoms of those casual shoes you've been promising to throw out for the past six years. All you have to do is hold the sole against the moving sanding belt, and presto, the sawdust and gook will be erased. This can make your workshop chores easier, and make you feel a whole lot better when your kids outgrow yet another pair of shoes. —*Sandy Cohen*

I was wondering why I never hear much of hickory being used for building furniture other than chair legs. It has nice grain and is a very tough wood. Is there something I don't know?
—*Steve London, Dupo, Ill.*

I agree that hickory is an admirable wood. It is tough, strong, hard, machines to a silky-smooth surface and takes finish well. It also is a fairly good wood for steam-bending. Historically, it was used more for furniture than it is today and was found especially good for parts that take a lot of stress and are prone to breaking.

I really don't know why hickory is not used more today, but

APRIL in DALLAS!

2 weekend seminar demonstrations by

IAN KIRBY

Please write or call for a free brochure.

- **Fine Hand Tools**
- **Makita Power Tools**
- **Fine Hardwoods**
- **Books & Magazines**

the Wood Store

1936 Record Crossing
at Harry Hines
West of St. Paul Hospital
Dallas, Texas 75235
214/631-5478

PORTABLE CHAIN SAW MILLS

Mill Your Own Lumber!

Four precision built, lightweight models available in either single or double engine versions. Capable of milling logs on site up to 50" wide, ½" to 15" thick, and any length.

Described in: Popular Science, June 1978
James Krenov - Fine Art of Cabinetmaking.

FOR FREE BROCHURE AND PRICES WRITE TO:

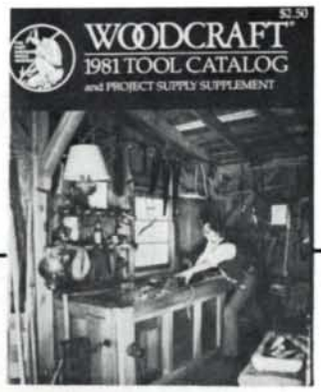
SPERBER TOOL WORKS INC.

BOX 1224, WEST CALDWELL, N.J. 07006 • U.S.A.
TELEPHONE: (201) 744-6110

$15.95 Plus $1.50 POSTAGE
Mass. Residents add 5% tax.
Dealer Inquiries Welcomed

SEND TODAY FOR BROCHURE

HOT TOOLS, Inc. 9 Hawkes Street • Marblehead, Mass. 01945



128 PAGE CATALOG AVAILABLE NOW

Our new catalog details over 3000 imported and domestic products, tools, benches and accessories which allow you the results you want with the satisfaction of using the best tools available. Many of these products are not generally available at local outlets. Send for your catalog today and see for yourself.

THICKNESS PLANE ON YOUR JOINTER

MAG-STRIPS $12.50

Do precision planing on your jointer with these wear resistant magnetic guides—attach and remove in seconds. You will be delighted with this new product—money back guarantee. Shipped by UPS in a sturdy storage container. Add $1.50 for shipping and handling. State length of infeed table—model # and mfgr.

☐ Check or Money Order
☐ Master Card ☐ Visa Exp. Date_____
Account #_____
Name_____
Address_____
City, State, Zip_____

Technova

P.O. BOX A356 EDWARDSBURG, MI 49112

PATENT PENDING ©1981

For the largest inventory in the East of woodworking machinery & supplies Powermatic, Rockwell and Makita call, write or visit

American Machinery & Motor Co., Inc.

22—24—26 Howard St.
New York, N.Y. 10013
Telephone (212) 226-4577

Fine Cabinet Plywood

- Cut Sizes
- Full Sheets
- Many Species

Free! *Catalog*

Name_____
Address_____
City_____ State_____ Zip_____

The Plywood Depot Inc.

P.O. Box 897
Gaylord, Mn.
55334

MARPLES FINEST CHISELS

This superior quality four piece set features the finest Sheffield steel for its blades. The handle is rare, polished boxwood, a clear dense wood which holds up well to mallet blows. The tang blade fits deep into the handle and is capped with a brass ferrule to prevent splitting. Set of four (¼", ½", ¾", 1"). Special price for Fine Woodworking subscribers — Usually $40.25, now only

02T20-M $30.95 ppd.

WOODCRAFT®

Dept. FW31, 313 Montvale Ave.
Woburn, Mass. 01888

Please send _____ Chisel Set (s) 02T20-M each $30.95 ppd.

☐ I enclose $1.00 for a 2 year subscription to the Woodcraft Catalog (free with order)

Payment by . . .
☐ Check enclosed ☐ VISA
☐ Mastercharge ☐ American Express
#_____ Expires _____
Name _____
Address _____
City _____
State _____ Zip _____

there are two possible reasons: First, hickory has wide sapwood, and darker woods are preferred for furniture, unless they are uniformly light and can be stained. Other species, such as maple, birch and even beech, can be controlled more easily when coloring or staining, and these woods also have strength properties suitable for furniture. Second, high-quality hickory is in short supply. In New England, hickory has been severely high-graded out over the past 300 years. It has been used as fuel, and was highly sought after for smoking meat. Consequently, what we have left is generally a poorer quality than other species suitable for furniture. The available stumpage is under heavy demand for specialty products, tool handles in particular.

I'm not sure about the supply of hickory in the Midwest, where I understand some of the finest hickory grows. Some of this (especially the pecan hickories) is sliced into face veneers for hardwood plywood, which is popularly used as wall paneling and in large, mass-produced pieces of furniture. In such pieces it is typically defective, but its blemishes are promoted as "character marks." *—R. Bruce Hoadley*

All of the experts I've read maintain that wood filler should be made of silex and get hard overnight. But the fillers on the market today are made of gypsum and do not get hard. Where can I buy a good filler? —Ed Spinks, St. Louis, Mo.

Fillers should dry hard, but the hardness comes from the set-up characteristics of the liquid (vehicle) portion of the filler, not from the hardness of the inert particles it carries. Silex, or silica, is preferred, if you have a choice. But I would guess that gypsum or calcium carbonate would work too. In the 18th and 19th centuries, common fillers included such diverse substances as pulverized brick dust and plaster of Paris.

The key is the vehicle, which should be a varnish-type material rather than a drying oil. One large chain retailer carries a wood filler that lists on the label linseed oil as the vehicle. I would guess that other commercial fillers also use the same basic formula.

Frankly, I don't know of a good, hard-drying filler on the market, and because of this I've given up using fillers. The work of applying soft fillers isn't worth the results produced. *—Don Newell*

Follow-up:

Bruce Hoadley's answer to Richard DeSimone's problem with using Elmer's Acrylic Contact Cement for gluing veneer *(FWW #23*, July '80, p. 18) is headed in the right direction, but is less clear than it could have been.

Water-base contact cement simply does not work with wood veneer, unless one wants cracks along the grain or gaps in the seams. I have experimented with many kinds of wood and with many brands of water-base adhesives, and the results were always the same—cracking veneer. Now I use a nonflammable, solvent-base contact cement. It's quite a bit messier to use, but it won't split the wood.

—Nelson M. Meyer, Detroit, Mich.

Re J.E. Gier's advice on buying spray equipment *(FWW #25*, Nov. '80, p. 36): I have a trick for those who don't have enough money to buy a compressor and spray gun, but who would like to spray lacquer finishes. Buy the best electric (airless) sprayer you can find on the market. It will work almost as well as the compressed-air outfit, and it has several advan-

Third Annual Conference

WOOD

A Contemporary View of a Traditional Material

Sat.-Sun., March 7-8, 1981
UC Berkeley campus

For a free brochure, call (415) 642-8840; or write to UC Extension, 2223 Fulton St., Berkeley, CA 94720.

University of California
University Extension, Berkeley

Sterling Hardwoods, Inc.
"Quality Lumber – Friendly Service"

Ash, Basswood, Birch, Bubinga, Butternut, Cherry, Cocobolo, Cottonwood, Ebony, Curly & Bird's-Eye Maple, Red & White Oak, Pines, Poplar, Purpleheart, Walnut, Mahoganies, Iroko, Teak, Rosewoods, Kingwood, Tulipwood, Pearwood, Padouk, Zebrawood. Many thicknesses 4/4 – 16/4 in stock. Wood for furniture, flooring, paneling, veneers, carving, turning, custom milling.

Send for pricelist and mail order forms.

Visit our warehouse and showroom of fine wood products representing over 70 professional woodworkers.

412 Pine Street
Burlington, VT 05401
802-862-0186

Beautifully **QUEEN Cabriole** *Carved* **ANNE Legs**

Walnut
Honduras Mahogany
Penn. Cherry
from *solid* 3" stock, only the "ears" are glued on.

Choose from sizes ranging from 7¼" slipper to 29" table leg... Send $1.00 for brochure. *(refundable on purchase)*

Rollingswood
Box 404 Dept. FW11
Grayslake, IL. 60030

Remove large quantities of wood fast with New Super Hog Power Adze

Save time and effort making contours with our unique cutting head. ⅝-11 thread fits most industrial heavy duty disc grinders. Use at speeds 2,500-8,000 r.p.m. Comes with 3 extra blades.

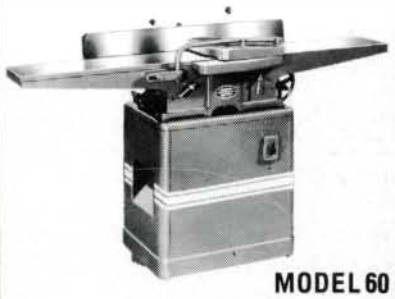
Carving head only $105 Includes Postage

Send check, money order, Amer. Exp., Master Chrg., Visa

Sculpture Associates, Ltd.
114. E. 25th St. N.Y., N.Y. 10010

We have the Metabo AG 1710 grinder, ideal for use with Super Hog cutting head. Send **$1** for 60 page catalog.

POWERMATIC



MODEL 60

8" JOINTER

The Model 60 8" Jointer is one of the many new Powermatics now in stock. We also offer the complete line of Rockwell and Powermatic Shaper Cutters (including Carbide), as well as Carborundum Abrasives.

WOODSHOP SPECIALTIES
P.O. Box 1013
East Middlebury, Vt. 05740
802-388-7969

The first comprehensive book on the subject. Expertly presented. Over 40 clocks in many styles with 200 photos and drawings. Great for the novice or the skilled. Superb ideas. 52 pages, soft cover.

Just **$4.95*** plus $1.50 P&H ☐ quan. _____

Special offer!

This fine new book, which will delight you . . . plus a marvelous #756 quartz movement (West Germany's finest), and a pair of Gold-tone Serpentine Hands. Quality products you'll appreciate. Introductory special, just **$11.95***

plus $2 ship. & handl. per order ☐ quan. _____.

Order extra #756 quartz movements! Accurate to 1 min. a year, runs up to 4 years on one 'C' battery. Gold-tone hands included with this ad. Warranted a full year. Only $7.95 plus $1.50 per order ship. & handl.*

☐ quan. _____. *Colo. res. add tax.

☐ Free catalog with order. All others 50¢ P&H.

Please send me the merchandise checked above:

Total mdse. _____ Ship. & hand. _____ Total_____

VISA/M.C.# _____

Exp. Date _____

Name_____

Address _____ (IF USING P.O. BOX NO. PLEASE ADD ADDL. $1 POSTAGE)

City/State/Zip _____

CLOCK CRAFTERS
INTERNATIONAL LTD.
5605 N. Peterson Ave., Sedalia, Co. 80135
Att: Dept.G

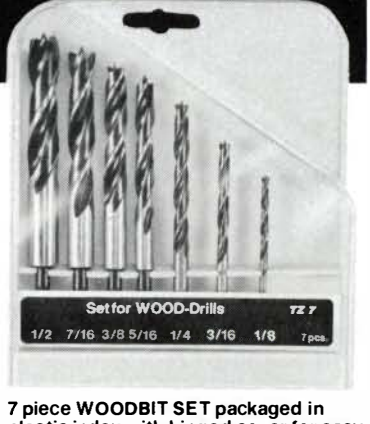
Act Now...Special Sale Price $11.95

Drill cleanly shaved, precisely placed holes

WOODBITS

FREE PLASTIC INDEX for handy storage

WON'T TEAR GRAIN, SPLINTER, CLOG OR BIND LIKE ALL-PURPOSE BITS



Designed to satisfy the standards of the most meticulous craftsman, this unique bit also gets the beginning woodworker off to a great start.

- **Center spur point holds the bit on target, pilots the hole, and prevents walking.**
- **Two knife-sharp cutting flutes cut and shave a perfectly round, clean hole.**
- **Flutes are designed with maximum clearance for chip ejection—won't clog or bind.**

Chrome, vanadium alloy steel set includes ⅛, 3/16, ¼, 5/16, ⅜, 7/16, ½" sizes.
Fit any ¼" or larger power drill.
Buy direct. Not available in hardware stores.

7 piece WOODBIT SET packaged in plastic index with hinged cover for easy access and handy storage– $11.95

Send me_____sets @ $11.95 each.
Shipping, handling, and insurance–add 1.75 F
☐ Check or Money Order (Illinois residents add 6% sales tax.)
☐ Master Charge ☐ VISA

Acct. # _____ Exp. Date_____

Name _____

Address_____

City_____ State & Zip _____

Orders shipped within 48 hours.

Satisfaction guaranteed— full refund if returned within 30 days.

AMERICAN INTERTOOL, INC.
1600 Jarvis Ave.,
Elk Grove Village, IL 60007

tages: It's exceptionally portable, produces fewer fumes, comes with a number of accessories and isn't attached to a large, cumbersome tank. Mine is a Wagner No. 300, and I use a #6 nozzle for spraying lacquer. The whole thing cost about $200, and I am very happy with it. It is not, of course, everything that a compressed-air system is, but it gives better and faster results than a brush.

—Michel Chevanelle, Acton Vale, Quebec

An addendum to my answer to George Rives *(FWW #25,* Nov. '80, p. 30): Proper planning of inlaid work excludes the use of stain or dye. However, there are exceptions. In France in the 1920s I worked with others in an assembly-line situation producting "antiques," most of which were inlaid. Each manufacturer of these fakes had his own mixture of dye, mainly a mixture of potassium dichromate and muriatic acid. This dye imitated the natural fading of all the woods and sort of blended them together. When dry, we fine-sanded each piece and then washed it with a brew of strong tea, which gave a pleasant yellowish hue to the object. The goal here was to meld all the colors together.

Unless this is your goal, too, my advice is to select all the woods when doing inlay work so that no staining or dyeing is required after assembly. *—George Frank*

Readers can't find:

Where can I get plans or drawings for an 18th-century music stand? *—Donald L. Cook, Park Ridge, Ill.*

. . . T-shaped bolts used in chair construction and locking bars for roll-top desks (these lock into the sides of the case rather than into the writing surface). *—Greg Doffin, Fargo, N. Dak.*

. . . a source for custom-cast brass monograms for applying to wood projects. *—Gerald R. Swendsen, Hanover Park, Ill.*

. . . an outboard faceplate for an old Power King lathe, model #7090. *—Ron Benson, Richmond, Va.*

. . . a replacement frog and 2⅜-in. iron for a Bailey No. 8 jointer plane. *—John Sandstrom, Ft. Dodge, Iowa*

. . . ⅞-in. dia. polished and lacquered brass candle cups for sconces. *—Paul Jager, Flint, Mich.*

Readers want to know:

In the Sept. '80 issue of *FWW* there were very nice plans for building one style of tool box. But it didn't fit my needs. I'd like very much to hear from other readers about tool-box designs and to see photos of their work, as well as plans and drawings. Features I'm concerned with include locking mechanisms, ways of fitting the drawers into the sides of the case, and methods of arranging and securing the tools in a neat, orderly fashion. Some tool boxes do double duty as workbenches. *—Richard W. Taylor, Pleasanton, Calif.*

Supplies:

—Bamboo stock for furniture projects (maximum length 6 ft.): The Country Seat, Box 24, RD 2, Kempton, Pa. 19529.

—Milk paint in liquid form: Turco's Color Cupboard, 212 Race St., Philadelphia, Pa. 19106. Write for nearest distributor or dealer.

—English holly in flitches up to 15 in. wide: Unicorn Universal Woods, 137 John St., Toronto, Canada M5V 2E4.

Send queries, comments and sources of supply to Q&A, Fine Woodworking, *Box 355, Newtown, Conn. 06470.*

History of Modern Furniture by Karl Mang. *Harry N. Abrams Inc., 110 E. 59th St., New York, N.Y. 10022, 1979. $25.00, hardcover; 185 pp., 383 illustrations.*

Twentieth-Century Furniture by Philippe Garner. *Van Nostrand Reinhold Co., 135 W. 50th St., New York, N.Y. 10020, 1980. $24.95, hardcover; 224 pp., 400 illustrations.*

Modern Furniture by John F. Pile. *Wiley-Interscience, 605 3rd Ave., New York, N.Y. 10016, 1979. $25.00, hardcover; 191 pp., 280 illustrations.*

At last here are three books that make sense, in words and photographs, of our own century's furniture. We've always had scads of good texts about antique furniture, all of which stop short 150 years ago, at the Industrial Revolution. Craftsmen wanting to move forward in time have had to comb magazine articles, plunder manufacturer's catalogs and pore over architectural texts. All three books attempt to knit together the many threads of 20th-century furniture design, and none of them wastes space or words on the vulgar stuff that fills most furniture stores. These books are about the best of our day, whether unique or factory-produced.

Mang's *History of Modern Furniture*, first published in Vienna and now translated from the German, is the most ideological of the three. Mang contends that furniture style precisely reflects the social forces at work in the era of its creation. As the Industrial Revolution brought about a new social order, so it brought new furniture into being. It also produced a tension that's not resolved even yet: "On the one hand, we have technical progress with its acceptance of new materials and continued improvement of production methods, of which an example would be Thonet's bentwood chairs; on the other, the movement for artistic quality and social equality called into being by William Morris. These two lines of development had to go through many detours before they converged in the early twentieth century in groups such as the German Werkbund, many of whose ideas the Bauhaus was later to spread worldwide." Mang attempts, in black-and-white photographs and a somewhat academic style, to trace those detours and convergences, and thereby to explain why modern furniture looks and functions as it does.

The most interesting connections he makes are between American Shaker furniture and the architect-designed furniture of the international style. There also are detailed chapters on Art Nouveau, Art Deco, De Stijl and the Bauhaus, plus Scandinavian Modern. As a working architect, Mang is naturally committed to industrial design and mass manufacture, and to the unfortunate fallacy that the independent artisan can produce furniture only for the wealthy elite. This, plus his European perspective, has left him ignorant of the craft revival in Britain and America these past ten years, so his book is weakened by this oversight.

Garner's *Twentieth-Century Furniture*, on the other hand, stays within the framework of the decorative arts and simply presents all of the important styles to have emerged in our time. The author is adviser to the Sotheby auction house on contemporary decorative arts, and thus he is not much interested in arguing about furniture for the elite versus furniture for the masses. He just shows us the best examples he can find of each modern style—dozens of photographs, many in color, of magnificent pieces by artisans and designers, many of whom I had not heard of before. Garner has not been blind to current developments either. He includes several pages about the craft revival of the 1970s, with photos of work familiar to readers of this magazine. Most valuable to me are his sections on the individual craftsmen who created Arts and Crafts (although he dismisses that phenomenon as "craft for craft's sake"), Art Nouveau and Art Deco. This furniture often looks made yesterday, or else a lot of furniture that actually was made yesterday is unwittingly derived from furniture that's 60 years old. Garner should be studied by any young craftsman who wants to avoid what's already done, or who thinks he has a new idea for a furniture form.

Pile's *Modern Furniture* is a quite different and more directly useful book. The author is an experienced furniture designer and a professor at the Pratt Institute in New York, and he has prepared what amounts to an introductory textbook for the design student. Rather than simply cataloging design trends (Garner), or attempting to explain them in social terms (Mang), Pile discusses in plain language what good design *is*. He carefully distinguishes function, structure and aesthetics, applies his analytical framework to several instructive examples, and only then delves into furniture history. Here too, his approach is unusual, for he does not dally on the minutiae of separating Chippendale from Queen Anne. Instead, he traces the broad evolution of furniture in society, with particular attention to the Industrial Revolution and 20th-century responses to it. Pile points out—as most texts forget—that much of the best industrial furniture has been designed by architects not because they sought wider fame, but simply because they "realized that there was no available furniture suitable for use in [their] buildings."

The history encapsulated and out of the way, Pile turns to the mechanics of being a furniture designer. He starts with drawings and useful charts that show how to predict such technical particulars as a design's weight, strength and stability. He turns next to materials and processes, cataloging and commenting upon the common woodworking joints, the variety and characteristics of modern wood-based materials, and the basics of modern industrial methods for working wood. He does the same for metals (with detailed specifications for available sections of rod, tubing and bar), for plastics, for upholstery materials and for hardware. These chapters are brief, but they're quite thorough and would be helpful even to the professional designer, if only as reminders of possibilities.

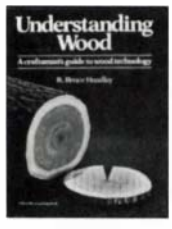
Finally, Pile shows how professional designers work: how they approach a new problem and define it, how they develop and refine sketches, how they transform them into working drawings, into models and into production prototypes. The illustrations here—photos of working material and of the finished products, from professional designers' portfolios—are priceless to the student, for they show the methods he must acquire and the standards to which he must work. Pile concludes with graphs of chair profiles, and reference charts of typical dimensions for household and office furniture.

In his introduction, Pile says he is writing for two audiences, the general public curious about design, and the would-be professional designer. He misses both targets, being too technical for the former and too elementary for the latter, but along the way he squarely hits a third audience he does not seem to have considered: the amateur craftsman. This is the best collection of necessary data and insight that I've seen for the person who's been building from measured drawings, and who now wants to start designing what he'll build. Pile will show you where, and how, to begin. His reference data probably include the odd facts you'll need, such as how much a running foot of LP records weighs. Coupled with Garner (for those who want lots of color photographs) or Mang (for those who like a little analysis with their photographs), it's an important addition to the workshop bookshelf. —*J.K.*

Fine Woodworking books will help you in your craft.

They're written and published with the same kind of care and attention to woodworking details we put in the magazine. You'll find them full of useful ideas and information because they're written and edited by woodworkers, for woodworkers. If you don't agree, we'll be happy to refund.

The woodworker's book about wood.



Bruce Hoadley has been studying and teaching wood science and technology for 28 years. He's been a woodworker and carver even longer, so he knows and understands well why wood behaves as it does and what a woodworker needs to know about it—from how trees grow to how best to cut, season, machine, join, bend, fasten and finish wood; even how to identify 54 common domestic and imported species. It's the definitive book about wood for woodworkers, clearly illustrated with spectacular photographs and informative drawings. We expect it to be a classic for many years to come. *Understanding Wood: A Craftsman's Guide to Wood Technology* by R. Bruce Hoadley, 272 pages, hardcover, $18 postpaid.

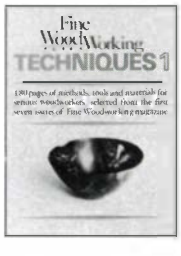
Watching a master cut and fit.

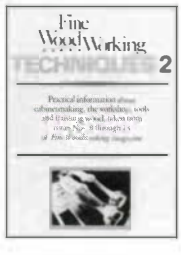
There's no better way to learn woodworking than to watch Tage Frid do it. He makes it look so easy. But then, if you know what you're doing, it can be easy. That's why we thought the best way of presenting Frid's vast experience was to photograph him at the bench, as he shows step by step how to use the tools and make the joints essential to good woodworking. Frid uses both hand and power tools and makes joints ranging from the simple tongue-and-groove to more complicated dovetails and multiple splines. He even shows how to construct the jigs he uses to make cutting and gluing easier. *Tage Frid Teaches Woodworking—Joinery: Tools and Techniques*, 224 pages, hardcover, $16 postpaid.

Rediscovering an almost forgotten lore.

Working green wood has always been a significant part of our woodworking tradition, but it has rarely been written about. John D. Alexander, Jr., has set things to right. In this clearly illustrated book, he guides you from the felling of a tree through splitting and fashioning the parts to constructing a handsome post-and-rung chair with interlocking mortise-and-tenon joints that tighten as the wood dries. He even shows how to strip and weave a bark seat. The book is full of intriguing lore you'll enjoy. *Make a Chair from a Tree: An Introduction to Working Green Wood* by John D. Alexander, Jr., 128 pages, softcover, $9 postpaid.

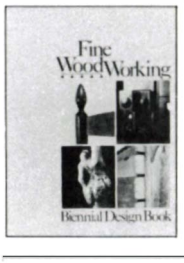
Two treasuries of woodworking information.

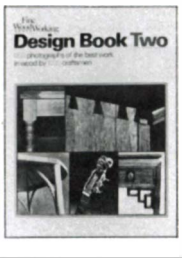




The technical articles in *Fine Woodworking* are not easy to come by. The vast array of information they contain is hard to find anywhere else. Now we're reprinting those articles in hardcover form just as they appeared in *Fine Woodworking*—no abridgments, no changes, only a few corrections of errors not caught the first time around. *Techniques 1* covers the first seven issues of *Fine Woodworking* and contains 50 articles by 34 craftsmen; *Techniques 2* covers issues eight through thirteen and contains 61 articles by 53 craftsmen. We've also included some Methods of Work. *Fine Woodworking Techniques 1*, 192 pages; *Fine Woodworking Techniques 2*, 208 pages, each $15 postpaid.

1,750 ideas for a winter's night.





When we were putting together the early issues of *Fine Woodworking*, so much good work had to be left out that we decided to do a separate book from pictures sent to us by the readers. We chose 600 for the *Biennial Design Book*, published in 1977. Two years later we followed it with *Design Book Two*, containing 1,150 photos. Both are more than spectacular picture books. They are strong statements of the incredible vitality of the woodworker's art in America today and a useful record for the future. *Fine Woodworking Biennial Design Book*, 176 pages, softcover, $10 postpaid. *Fine Woodworking Design Book Two*, 288 pages, hardcover $16, softcover $12 postpaid.

TO ORDER: *Use the convenient order form in the back of this magazine or send your order with payment to (Connecticut residents add 7½% sales tax):*

The Taunton Press 52 Church Hill Rd., Box 355, Newtown, CT 06470

BUYING HARDWOOD

In these hard times, it's good to know that somewhere some commodity can be bought at a bargain. This winter, domestic hardwoods are just that. Because interest rates are so high, mortgages are in short supply, and that has put the housing market in a deep rut. Thus the demand for new furniture—and thus for domestic hardwoods—is significantly down. Thousands of board feet of cherry, walnut, poplar, ash and other native species are sitting as idle inventory in yards, mills and warehouses across the nation. Supply and demand favors the woodworker, if he's got some ready cash to invest in filling out his stash of materials.

Checking around the continental U.S., we learned that prices for domestic hardwoods have been stable for the past six months. In fact, some prices for some species are even lower now than they were a year ago. Generally, prices are lowest in the Midwest, especially in Ohio. In the Northeast, the South and in parts of the Southwest, lumber can be bought for just a little more. But West Coast prices are high, and dealers there tend to stock mostly the higher grades—FAS and Select and Better—as it's not worth it to pay the freight for No. 1 Common. But the best buy is No. 1 Common, especially for expensive cabinet woods like walnut and cherry, as on the average the price is about 32% lower than the FAS price. Unless your project requires long, wide, clear cuttings, you don't really save more in materials when you buy FAS, and in many cases you're better off gluing up panels from narrower boards. So if you want to get the most from your investment in domestic hardwood lumber, buy No. 1 Common, though any purchase while prices are still low would mean money well spent.

	4/4 FAS			8/4 FAS			4/4 No. 1 Common
	Avg.	High	Low	Avg.	High	Low	Average
Ash	$1.96	$3.72	$1.20	$2.25	$3.75	$1.35	$1.27
Birch	1.85	3.20	.88	2.25	3.25	1.36	1.02
Butternut	2.15	4.00	1.04	3.39	4.45	2.74	—
Cherry	2.34	4.05	1.40	2.75	5.05	1.69	1.61
Honduras mahogany	2.61	4.00	1.68	2.96	4.35	1.75	—
Hard maple	1.51	3.64	.85	1.63	2.50	1.05	1.04
Poplar	1.19	2.00	.75	1.35	2.25	.85	.93
Walnut	3.52	5.64	2.00	4.13	6.00	2.80	2.34

According to one buyer for a national hardwood-lumber chain, you'll be paying more for wood when the general economy begins to recover. If interest rates drop, stimulating the building and furniture-making industries, the demand for lumber will rise, and the supply will soon become short. Prices could take a quantum leap. Another thing that may affect hardwood prices is in the offing. Suppliers, eager to offset their losses on the home front, have been courting foreign industry to increase exports. And exported wood, you can be sure, is of the highest quality, for most of it is destined for the veneer mill.

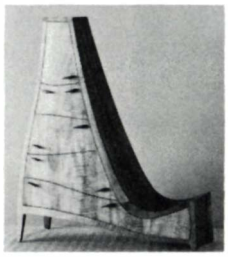
If you find that you're able to take advantage of the present situation and can make a substantial investment in lumber, be sure when you make it into a client's dining-room table or chest of drawers two or three years from now, that you charge for that wood at the current price. You'll have to replace it at the going rate, so it would be wise to make inquiries at the lumber yard before bidding on a particular job.

Don't make the mistake of buying more wood than you can store properly, or you'll have wasted your money and a lot of good lumber. Boards should be stored neatly indoors or under shelter on a level surface, and each layer in the stack should be uniformly stickered every 16 in. The bottom layer ought be elevated at least 12 in. off the ground, and the whole stack should be as regular as possible, with a minimum of overhanging ends.

In December of last year, we surveyed 24 hardwood distributors to come up with the figures in the chart above. Few dealers stock butternut and Honduras mahogany in No. 1 Common, so these two have been omitted from that list. All prices (per board foot) are based on a minimum order of 100 board feet and exclude milling or delivery charges. —*J.L.*

Jere Osgood

Lamination



and Wood Furniture Design

May 19–June 26, 1981

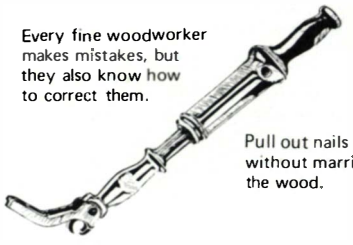
For information about summer, evening, and academic-year courses:

Program in Artisanry
Boston University
620 Commonwealth Ave.
Boston, Ma 02215
617/353-2022

WOODBUTCHER TOOLS

Shelter Institute Bldg.
38 Center Street
Bath, Maine 04530
207-442-7937

Every fine woodworker makes mistakes, but they also know how to correct them.



Pull out nails without marring the wood.

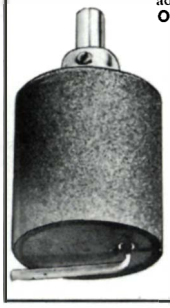
Send $2.00 for our special catalog and price list.

WEIRD WOOD

BUTTERNUT, WALNUT, ROSEWOOD, PINE, CHERRY, BUCKEYE and about a dozen other woods, in boards, slabs and freeform cut ovals. Pieces up to 6″ thick, 3′ wide and 16′ long in some species. We specialize in coffee tables, benches, bars, carving stock, clock ovals and movements, accurately cut for you to finish. We sell by mail and from our fantastic wood "museum," 9-5 except Sunday. Send 50¢ for brochure.

WEIRD WOOD, Box 190FW
Chester, Vt. 05143, 802-875-3535

USE ON:
Drill press
Small motor
Lathe
Shopsmith
Rockwell
Montgomery Ward
Craftsman
¼″ Elec. drill



Sleeveless DRUM SANDER

NO PRE-MADE SLEEVES TO BUY

ECONOMICAL-Simply cut sandpaper from standard size sheets. **UNIQUE** way of holding paper to drum. Twist of key and paper is tight. **SPONGE RUBBER** backing insures long wear of paper. Hubs ½″ bore. Price includes ½″ adapter but u on request we will substitute a ¼″ adapter for small drills. **ADD $2.25 PER ORDER FOR HANDLING.**

—1″ x 3″ long $12.70
—2″ x 3″ long $13.75
—2½″ x 3″ long $14.40
—3″ x 3″ long $15.70

ABOVE 4 DRUM $51.20

2½″ x 4½″ $19.90
3″ x 4½″ $21.25

Above sizes (without adapters) also available with ½″ 20 R.H. Thread (Sears, Ward).
⅝″ bore (Shopsmith) except 2″x3″

Send Check or Money Order
MONEY BACK GUARANTEE

SINGLEY SPECIALTY CO., INC.
P.O. Box 771-F
Hendersonville, N.C. 28793

---

19 PAGES OF HARD WOOD AND EASY READING: $1.00

Our catalog lists dozens of books that show how to build everything from birdhouses to barns. It also lists 32 kiln-dried, cabinet-grade Appalachian woods. Plus hard-to-find veneers and turnings. For 27 years, we've guaranteed every board foot we ship. We also guarantee a return on your $1.00 investment.

Please send your catalog. I enclose $1.00, which you'll refund with my first minimum order.

Name_____

Address_____

City_____ State_____ Zip_____

We sell at delivered prices.

EDUCATIONAL LUMBER COMPANY, INC.

P.O. Box 5373 FW
21 Meadow Road
Asheville, N.C. 28803

Build this timeless Crystal Regulator Clock in practically no time.

This easy-to-build pre-cut project captures all the elegance of 19th century France . . . a classic design you'll proudly display in your home.

Enjoy tremendous savings over retail. It includes accurately cut cherry wood parts, hardware, beveled glass, dial and solid brass spring-drive 8-day West German pendulum movement with half-hour bell strike. 15″ high x 10¾″ wide x 7¾″ deep. Easy assembly instructions included. Send check or money order.

ONLY **$199.00**

Postage paid.

Mass. residents add 5% sales tax.

Free with order—32 page color catalog of Grandfather, Grandmother, wall, desk and mantel clock kits for all levels of skill. Plus movements, dials, accessories, hardware, tools and books. Satisfaction guaranteed. Catalog only, send $1.00 for postage and handling.

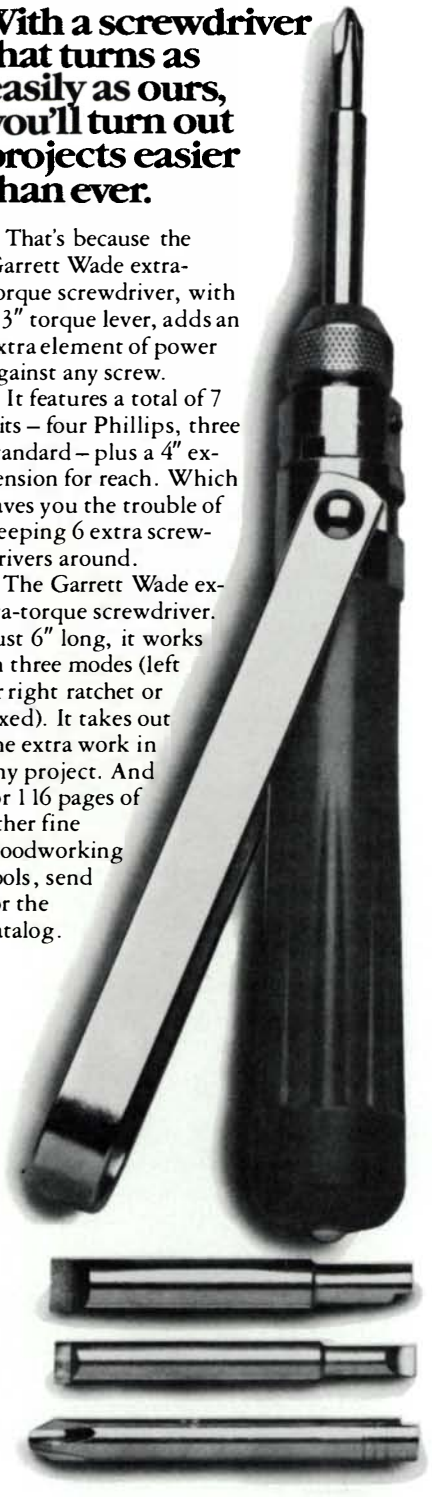
Name_____

Address_____

City/State_____ Zip_____

Mason & Sullivan Co.
Dept. 2118, Osterville, MA 02655

With a screwdriver that turns as easily as ours, you'll turn out projects easier than ever.



That's because the Garrett Wade extra-torque screwdriver, with a 3″ torque lever, adds an extra element of power against any screw.

It features a total of 7 bits – four Phillips, three standard – plus a 4″ extension for reach. Which saves you the trouble of keeping 6 extra screwdrivers around.

The Garrett Wade extra-torque screwdriver. Just 6″ long, it works in three modes (left or right ratchet or fixed). It takes out the extra work in any project. And for 116 pages of other fine woodworking tools, send for the catalog.

Offer expires September 15, 1981.

Garrett Wade Co.,
Dept. FW-3-81
161 Ave. of the Americas
N.Y., N.Y. 10013

☐ Please send me_____ extra-torque screwdriver(s) @ $26.90 p.p.d. each.
☐ Please send me_____ new Garrett Wade catalog(s) @ $1 (free with torque screwdriver order).
☐ Check or money order enclosed.
☐ Visa/Master Charge/American Express.
_____ Amount enclosed. (Add sales tax for NY State residents).

Card No. _____ Expires_____

NAME_____

ADDRESS_____

CITY_____

STATE_____ ZIP_____

THE EGG AND I

BY ADELAIDE SPROUL

Philip McElroy

When my youngest child was three, she asked her grandmother to teach her to knit. When told she was too young, my determined daughter replied, "What you say I can't do I can do," so my mother meekly got out the knitting needles. I was reminded of this incident by my introduction to woodcarving at the New England Craftsmanship Center in Watertown, Mass. For years I had suppressed the urge to carve and was determined to learn but felt shy and tentative when I arrived for the first class. The assumption that greeted me was that I could do what I thought beyond my capabilities, and I was immediately launched into making my own tools. To my astonishment and delight, by the end of the second class I had made two very respectable tools, a gouge and a chisel, and learned to sharpen them (I whose kitchen knives are as dull as hoes). As soon as the chisel was sharp I was required to sharpen my new soft black pencil with it, not too difficult for one who had studied drawing in a large class with no pencil sharpener. The first carving assignment, however, was not so easy: to carve an egg. It seemed like an impossible challenge. With the expert help of my teacher, Nat Burwash, I did achieve an egg and then several other small pieces, becoming more absorbed by the possibilities with each project.

Under Nat's guidance, each student starts with two half-round files 4 in. by ½ in., and one flat file 6 in. by ¾ in. by 1/16 in. One half-round file is ground into a gouge that is curved on the cutting edge (a push tool). After grinding, the edge is finished on an oilstone, then buffed on crocus cloth until it is razor sharp. The chisel is made out of the flat file following the steps used for the gouge. The second half-round file is mounted on a handle, as are the other tools, and used to file shapes smooth.

Now comes the egg, which means thinking that shape into a small chunk of butternut with the help of a pencil. Most beginners draw on one side of the block without considering the top view, or they may draw the shape out to the edges on the largest side of the block, which results in an egg too large for the wood. These problems immediately force one to consider the concept of three dimensions and to study all sides of the block in relation to that egg shape. It is particularly helpful at this stage to study the top view, because from this vantage one can see how the sides of the egg move down and out toward the sides of the block. The next step is to decide where to plan the greatest diameter of the egg, the equator, and to mark it with a firm line.

Now carving starts; using gouge and chisel, the technique is to cut away from the equator toward each end, cutting with the grain in each direction. Since these small beginning blocks are split in the direction of the grain, it is not hard to find after a few cuts which way the grain goes and to work with it. It is good to have help within call, but one learns very quickly by trial and error. I found it most efficient to grip the handle of the tool with fingers only and use the thumb as a counter force against the thrust of carving, pushing straight ahead without prying or lifting. Turning the block keeps progress even on all sides. Forced prying can break gouge or chisel. When roughing out the first shape, direct pressure works best; fine chips and a scraping motion come later. Obviously, one must hold the wood so that hands are not in the path of the advancing chisel. It helps if extra wood is left attached to the egg as a handle until the very end.

In spite of much blundering, pushing the gouge against all the demands of nature and a surface that looks like the craters of the moon, one does achieve an egg shape. Then the next challenge is finishing. I might say parenthetically that finishing is not just making a smooth surface; it involves thinking through and refining the shape and can go on for a

The Urban Studio

long time. When the egg is, as far as mass goes, an egg, it is ready for the final carving, really the first step in finishing. Turn the egg around in a strong light, look and feel for the high places and carefully shave them down with a newly sharpened chisel, using a sideways motion and taking off very small shavings. When you think it is really quite even, you have only just begun, for the next step is to file the surface until all the gouge and chisel marks and small humps are gone. A long, firm stroke works best; start at the equator and file to the point of the egg, then turn the egg around and work from the equator to the blunt end. Following this comes sanding with the grain, starting with coarse sandpaper, then fine, which will produce a satisfactory polish.

The final finish, when the carved, filed and sanded egg feels smooth and shows no rough places, is a liberal application of boiled linseed oil, which stands for 10 minutes and is then thoroughly wiped off. After 24 hours the process is repeated. It is important to wipe the oil off thoroughly and to proceed slowly; otherwise the surface becomes sticky and messy. With patience, after three to five such applications, the surface builds to a beautiful patina. I like to sit quietly with a newly oiled piece and buff it with a soft cloth until it glows; then I know the work is finished.

Today one can purchase anything from wood to apples neatly encased in a plastic skin. There is no hint of the sprawling roughness of trees; it is easy to forget where the materials originate. One of the satisfactions of the craftsman is to go to the source—to dig the clay, cut the tree, spin and dye the wool, grind the pigments—to become acquainted with the patient beginnings that are the foundation of expressive life. In this day of prefabricated everything, we must find our way back to raw materials—sand, clay, wood—the roots of our imaginative existence and the building blocks of our future, the stuff of the earth. To return to my daughter's words, we need to know that what we think we can't do, we can do. I found this out one day when my teacher, ever alert to new challenges for his students, showed me a nice piece of butternut and suggested it was time for me to start a larger project. The "nice piece" was a 4-ft. log, of which I wanted half. But I had never split a log (the small chunks for our beginning eggs were split for us). Who would do that for me? Silence, inaction as I fretted to get to my new work. Finally I was given two wooden wedges and a mallet along with some hints on how to get started, the main requirement being to hammer hard. As the wedges parted the fibers of the wood and a clean split traveled to the bottom of the log, I was elated out of all proportion to my acomplishment.

An egg shape, the beginning of it all, is just a start. Having finished the egg it doesn't seem preposterous to attempt an animal, a person, an abstraction. The same tools will suffice, unless, like me, you try a larger piece and wish to add a larger gouge and chisel and a spokeshave. But still a great deal of the process happens in one's lap, slowly and contemplatively. Perhaps this is why it means so much; carving wood that took a long time to grow is undertaken only in "good sadness," with time for thought and a ripening of perception. □

Adelaide Sproul, 66, of Cambridge, Mass., is an artist and author of books on printmaking, drawing and resources for art teachers. Carving this egg launched a whole new career; she has been selling and exhibiting her wood carvings for the last six years.

Makita

FINISHING SANDER MODEL BO4510

One-hand palm grip design. Flush sands into corners. Powerful 1.8 Amps. 115 V. 12,000 Orbits per min. One year limited warranty. 2.4 lbs. 4" x 4⅜"

$49.95 POSTPAID
List Price $64.00

SANDER OFFER EFFECTIVE THRU 4/30/81

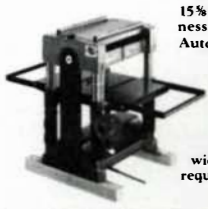
Makita

BANDSAW MODEL 2116
ACCURATELY AND POWERFULLY RESAWS BOARDS UP TO 12" WIDE.

Depth of throat 13". Wheel size 16". Height of machine 52". Weight 297 lbs. Blade width ⅛" up to 2". Motor 2 HP. Industrial type machine priced for the small professional shop or serious amateur. Demonstrated at World Woodworking Expo 80.

THICKNESS PLANER MODEL 2040

15⅝" Max. width. 7½" max. thickness. Motor 2 HP. Weighs 254 lbs. Automatic feed.



THICKNESS PLANER/JOINTER MODEL 2030 (Not pictured)

Efficiently combines 12" wide automatic feed planer with 6" wide jointer with no change-over required. Jointer has 59" long bed. Motor 2HP. Weighs 275 lbs.

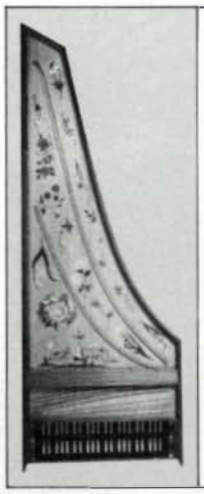
Bandsaw and planers shipped freight prepaid anywhere in continental U.S. Call or write for prices and full specifications.

To order sander, mail check, money order or Mastercharge/VISA info. to:

HIGHLAND HARDWARE

1034 N. HIGHLAND AVE., N.E., DEPT. F27
ATLANTA, GEORGIA 30306 (404) 872-4466

Send $1.00 for our catalog and pricelist of woodworking tools and books. In Atlanta, visit our showroom to see a demonstration of our Swiss-precision INCA power tools.



HARPSICHORDS & FORTEPIANOS

Build it yourself from one of our kits or let our experienced craftsmen build it for you.

Three Centuries of Harpsichord Making by Frank Hubbard ($17 postpaid)

For brochure send $1.00 to:
FRANK HUBBARD INCORPORATED
144-W Moody Street,
Waltham, MA 02154
(617) 894-3238

Fine Hardwoods:

ash, basswood, birch
cherry, mahoganies
maple, red and white oak
poplar, teak, walnut

Pine:

eastern, ponderosa, sugar

LEONARD LUMBER CO.

Tel. 203-269-2626
P.O. Box 2396, Branford, CT 06405
Warehouse: Wallingford, CT.
Large selection ½" to 4" kiln dried
Dealership programs offered

Visit our 5th annual In-House Woodworking Machinery Exposition in Jersey City, New Jersey
April 9, 1981 1-9 p.m.
April 10, 1981 1-9 p.m.
April 11, 1981 9-5 p.m.
Free with food and beverage

NOW AVAILABLE

The Most Complete Catalog ever compiled for the Woodworker.

Send for your catalog now.

Only $5.00 (to be applied to your first purchase)

Over 300 pages

Rudolf Bass, inc.
45 Halladay Street Jersey City, New Jersey 07304
I'm enclosing $5. for my catalog. (Check or money order, no cash or COD, please).
Name
Address
City/State
Zip

FOR THE FINE WOODWORKER

From "Artistry in Veneers"...

Beautiful veneers in more than 80 distinctive wood grains, our finest architectural stock, at exceptional prices. Your precise project needs delivered in quantities as small as a single leaf. Also fancy butts, burls, crotches, and swirls. Breathtaking border inlays in your choice of 42 designs. Dyed wood veneers, available in 16 magnificent "no fade, no run" colors, to compliment any type finish! A complete line of quality tools, professional services, correspondence, and recommendations. An inventory of more than 3 million sq. ft. of domestic and imported veneers.

"Artistry in Veneers"... specialists, suppliers, and consultants to woodworkers throughout the world!

ARTISTRY IN VENEERS
Dept. FW9, 633 Montauk Ave.,
Brooklyn, N.Y. 11208
(212) 272-6800

Send 75¢ for our new catalog and discover a whole new world of woodworking.

HORTON BRASSES

Nooks Hill Road, P.O. Box 120F
Cromwell, CT 06416
Tele: (203) 635-4400

Mfrs. of Cabinet and Furniture Hardware for Homes and Antiques
Send $1.50 for a Catalogue

For Hardwood Lumber

WOOD WORLD

9006 Waukegan Rd.
Morton Grove, IL 60053
(312) 965-4420

Over 50 species

- Rosewood
- Walnut
- Bubinga
- Teak
- Oak
- Cherry
- Zebrawood
- English Yew
- Mahogany

Block Front Chest
Circa 1760-1780

**Henry Ford Museum Reproduction*

Build Your Own Heirlooms

One of 27 Bartley 18th Century reproduction kits, in handcrafted solid mahogany, ash or cherry. Totally authentic in design. Each kit is easily assembled and finished in your home.

For color catalog send $1.00

Name _____

Address _____

The Bartley Collection, Ltd. ®
747 Oakwood Ave., Dept. B-109,
Lake Forest, IL 60045

Events

Events listings are free but restricted to workshops, fairs, lectures and exhibitions of direct interest to woodworkers. The next deadline is March 1, for events beginning May 1 to July 15.

ARIZONA: **Fiesta de los Arts**—May 16-17, Tlaquepaque, Sedona. Juried exhibit, 5 slides or photos, $10 entry fee; deadline, April 1. Contact Lucy Banks, Sedona Arts Center. Box 569, Sedona, Ariz. 86336.

CALIFORNIA: **Woodcarving Show**—Santa Clara Valley Carvers, April 25-26, Leininger Community Center, 1300 Senter Rd., San Jose.

CALIFORNIA: **Exhibition**—work by college-level teachers who are active and professional craftsmen in Southern California, April 6 to May 11, Art Gallery, Fine Arts Bldg., California State College, San Bernardino. Write Leo G. Doyle, Art Dept., California State College, 5500 State College Pky., San Bernardino, Calif. 92407.

CALIFORNIA: **Pacific States Craft Fair**—Aug. 20 (trade), Aug. 21-23 (public), Fort Mason Facilities, San Francisco. Application deadline, March 10. Write American Craft Enterprises, Box 10, New Paltz, N.Y. 12561.

CALIFORNIA: **A Day with Sam Maloof**—10 A.M. to 2 P.M., March 27, enrollment limited. Contact The Cutting Edge, 3871 Grand View Blvd., W. Los Angeles, Calif. 90066. Evening classes start mid-March. Contact the Cutting Edge, 1836 Fourth St., Berkeley, Calif. 94710.

CONNECTICUT: **Craft Workshops**—March 28-29, Marquetry and Veneer Work, Silas Kopf; April 4-5, Lamination Techniques, Jere Osgood; April 11-12, Chip and Chainsaw Carving from Trees, Jon Brooks; April 25-26, Lumbering for Woodworkers, Edgar Anderson and Robert Sperber. About $50/workshop. Brookfield Craft Center, Box 122, Brookfield, Conn. 06804.

DISTRICT OF COLUMBIA: **Photographing Your Work**—workshop with Bob Hanson, primary photographer for the American Craft Council. March 14-15; $45 for ACC members, $53 nonmembers, $37 full-time students. Greenwood Gallery, 2014 P St. NW, Washington, D.C. 20036.

FLORIDA: **Woodcarving Show**—work by members of the Gulf Coast Carvers, March 14, Church of the Palms, 3224 Bee Ridge Rd., Sarasota.

GEORGIA: **Two Seminars**—the custom table, with Edgar Anderson, March 20-22, $125; bent-lamination, with Jere Osgood, April 24-26, $125. The Georgia Woodworker, Atlanta. Contact Herb Teeple, The Georgia Woodworker, 5015 Spalding Dr. NE, Atlanta, 30360.

ILLINOIS: **Woodcarving Show**—work by members of the Chain-O-Lakes Woodchippers of Northeastern Illinois, April 25-26, Lakehurst Shopping Center, Routes 120 and 43, Waukegan.

ILLINOIS: **Health Risks in the Arts, Crafts and Trades**—conference on toxicology, industrial hygiene, and health and safety programs for schools, April 2-4, Blackstone Hotel, Michigan and Balboa, Chicago. Contact George Scherr, 2405 Bond St., Park Forest South, Ill. 60466.

INDIANA: **Woodcarving Show**—work by members of the Duneland Woodcarvers, March 21-22, Marquette Mall, Michigan City.

KANSAS: **Wood Lathe Seminar**—spindle turning, faceplate turning and metal spinning, March 26-27, Pittsburg State University, Pittsburg. Write Duane Griffiths, PSU Wood Technology, Pittsburg, Kans. 66762.

MARYLAND: **Spring Arts and Crafts Fair**—April 10-12, Montgomery County Fairgrounds, Gaithersburg.

MASSACHUSETTS: **Furniture by Jon Brooks, porcelain sculpture by Mona Brooks**—March 9 to April 4, Ten Arrow Gallery, 10 Arrow Street, Cambridge.

MASSACHUSETTS: **Fair of Traditional Crafts**—May 2-3, Old Sturbridge Village, Exit 9 off the Massachusetts Turnpike, Sturbridge.

MASSACHUSETTS: **New England Buyers' Marketplace**—April 27-28, Hynes Auditorium, 900 Boylston St., Boston.

NEW JERSEY: **Rudolf Bass Woodworking Machinery Exposition**—including Rockwell, Holz, Timesavers, Onsrud, and L&L machines and factory representatives. Rudolf Bass, 45 Halladay St., Jersey City. April 9-10, 1 P.M. to 9 P.M., April 11, 9 A.M. to 5 P.M..

NEW YORK: **Hand-Turned Wooden Vessels from Forest to Museum**—slide lecture by Mark Lindquist, March 22, 2:30 P.M., 92nd Street YM-YWHA, 1395 Lexington Ave., New York. Admission, $3.50.

NEW YORK: **Furniture by Ed Zucca**—April 9 to May 17, Workbench Gallery, 470 Park Ave. South, New York.

NEW YORK: **John Henry Belter and the Rococo Revival**—show of elaborately carved furniture by "New York's most famous furniture maker of the 19th century," March 10 to May 10, Cooper-Hewitt Museum, 2 E. 91 St., New York.

OHIO: **Spray Finishing Technology Workshop**—March 23-27, Bowling Green State University, Bowling Green and the DeVilbiss Co. World Headquarters, Toledo. Includes equipment and material selection, automotive spray-refinishing, furniture and industrial spraying. Contact Richard A. Kruppa, School of Technology, Bowling Green State University, Bowling Green, Ohio 43403.

OKLAHOMA: **Restoration Workshop**—repairing antique and modern wood furniture, April 2-3, Moore-Norman Vocational-Technical School, Norman. Contact Leon Linton, Adult Education Dept., Moore-Norman Vocational-Technical School, 4701 12th Ave. NW, Norman, Okla. 73069.

OREGON: **Woodworking Classes**—beginning woodworking (Stuart Emmons, Sam Bush), hand-tool techniques (Walter Huber), projects, woodcarving (Sam Bush), joinery (Stuart Emmons), drawing for woodworkers (Karen Clark), March 30 to June 5; steam-bending workshop (William Keyser), Aug. 10-15; Oregon School of Arts and Crafts, 8245 S W Barnes Rd., Portland, Ore. 97225.

PENNSYLVANIA: **Windsor Chairmaking**—seminar with Michael Dunbar, March 14-15, sponsored by the Western Pennsylvania Woodworkers Club. Contact Bill Asher, c/o Cokesbury Bookstore, 901 Penn Ave., Pittsburgh, Pa. 15222.

TENNESSEE: **Summer Workshops**—Surface treatments, Wendy Maruyama, June 22 to July 3; furniture construction, Bruce Beeken, July 6-17; chair construction, Michael Hurwitz, July 20-31; marquetry, Silas Kopf, Aug. 3-7; sculpture, Frank Cummings, Aug. 10-14; woodturning, Stephen Hogbin, Aug. 17-21; milling, Bob Sperber, dates to be announced. Appalachian Center for Crafts, Box 347 A-1, Rt. 3, Smithville, Tenn. 37166.

TEXAS: **Dallas Craft Market**—March 19-20 (trade), March 21-22 (public), Market Center, street address to come, Dallas. Information from American Craft Enterprises, Box 10, New Paltz, N.Y. 12561.

TEXAS: **Woodworking Seminars**—with Ian Kirby, The Wood Store, Dallas. Hand tools and skills, April 11-12; joinery, May 2-3. Write Myer Frauman, The Wood Store, 1936 Record Crossing, Dallas, Tex. 75235.

UTAH: **Workshop with Alan Peters**—design and craftsmanship in the English tradition, for serious amateur and professional woodworkers, July 13-17, Brigham Young University, Provo. Details from Dale Nish, 230 SNLB, Brigham Young University, Provo, Utah 84602.

VERMONT: **Restoration of Furniture and Fine Woodwork**—workshop with British craftsman Kenneth E. Bowers, June 8-13, $375, Kirby Studios, N. Bennington. Write Ian Kirby, BCIC Bldg., Water St., N. Bennington, Vt. 05257.

WISCONSIN: **Spring Carving Show**—Mid-Wis-Chippers and the Badger State Carvers, April 26, Oshkosh Eagles Club, 405 Washington St., Oshkosh.

Connections

In CONNECTIONS, *we'll publish membership calls for guild-style organizations, letters from authors compiling directories in which craftsmen might like to be listed, and appeals from readers with special interests looking for others who share them.*

Texas furniture craftsmen and designers interested in organizing a Texas furniture guild for the promotion of Texas-crafted and designed furniture please contact Jim Wallace, 1105 S. Riviera Cr., Cedar Park, Texas 78613.

Guild Ten, a n organization o f professional woodworkers, has opened a cooperative gallery for exhibiting their work. The gallery will provide a wide range of woodworking and design services, from sculpture and treen to furniture, architectural woodwork and antique restoration. You are cordially invited to visit the gallery, on Old Bethlehem Rd. at Sawmill Rd., Applebachsville, Pa., or write Stephen J. Ripper at RD 4, Box 197, Quakertown, Pa. 18951.

CLASSIFIED

WOODTURNING—Are you interested in woodturning as a hobby? Take a two-day intensive course for beginners from a qualified instructor. Write PRACTICAL WOODTURNING, PO Box 102, Orangeville, Ontario, Canada L9W 2Z5.

Arcosanti Woodworking Program conducted at Paolo Soleri's "City of the Future." 5-wk. workshops: Apr. 6, June 8 & Sept. 28. For info. write: Wood Shop, c/o Kerry Gordon, Arcosanti, Star Route, Mayer, AZ 86333. (602) 632-7135.

Furniture Designer/Craftsman—PARTNERSHIP available in custom furniture shop with affluent clientele. (503) 288-9943 eves. 3160 N.E. 35th Pl., Portland, OR 97212.

Myrtlewood RETAIL/WHOLESALE BUSINESS, with gift shop, home, manufacturing plant and 4.5 acres of land. Located on the southern Oregon coast. $250,000 with terms. PO Box 603, Bandon, OR 97411. (503) 347-2500.

Custom furniture/cabinet mfg. FOR SALE. Fully equipped. Good West Los Angeles area. 1979 gross $117,000. Full price, $49,000. Terms to qualified buyer. Business Sales Specialists (213) 345-1896.

APPRENTICE VIOLINMAKERS AND RESTORERS: Positions available. Good salary and benefits. Background in woodworking and/or music helpful. Must be willing and able to learn. Bein & Fushi, Inc., 410 S. Michigan Ave., Chicago, IL 60605.

APPRENTICESHIP in structured two-year program for fine woodworking in successful studio/workshop/showroom. Individual supervision working with solid walnut/rosewoods using only interlocking wood joints and pegs. Tuition. Jeffrey Greene Design Studio, Ney Alley, New Hope, PA 18938.

POSITION AVAILABLE: Woodworker to design and fabricate oriental wooden furniture and accessory items. Design and apply mother-of-pearl finishes to oriental furniture. Apply lacquer and other oriental wood finishes. Small shop supervision and six years experience minimum. Minimum wage $7 per hour. Sun Hee, Inc., Box 185, Pepperell, MA 01463.

Small shop has OPEN TIME for short to medium runs on any type wood parts. C. Ray Pray, 250 Roosevelt St., Bristol, PA. (215) 788-4738.

KILN-DRIED HARDWOODS. FAS Walnut, oak, cherry, mahogany, etc. Also walnut, oak and redwood slabs for tabletops and clocks. Price list free. Kountry Kraft Hardwoods, RR 1, Lake City, IA 51449.

LUMBER, wholesale, retail, hardwood, softwood, plywood, milling. $200 shipping minimum. Amherst Woodworking, 575F, Northampton, MA 01061. (413) 584-3003.

REDWOOD BURL, myrtlewood, fig, olive slabs. All sizes. Redwood Burl-Esque, Dept. FW-381, 1454 Orchard Home Dr., Medford, OR 97501.

BOSTON AREA Woodworkers. Hardwoods, softwoods, plywoods, accessories. Cutting to size, planing. Open Saturdays. (617) 666-4030.

ROSEWOOD LUMBER, widths 6 in. to 18 in., lengths 8 ft. to 16 ft. Dry, FAS. $3.85/bd. ft. MWW Co., Box 362, Albion, CA 95410. (707) 877-3408.

KILN-DRIED BASSWOOD. Easy to carve. 1 in. thick to 4 in. square. Many widths, lengths. Blue Mustang, Box 173B, Racine, WI 53401.

KILN-DRIED CABINET WOODS. Buy direct. Complete selection hardwoods—mahogany—eastern white pine. Lumber and squares. Send SASE for free price list. Churchill Forest Products, 91 Franklin, Hanson, MA 02341.

THAI & BURMA TEAK: Lumber and plywood, any quantity. Quality Woods Ltd., Box 205, Lake Hiawatha, NJ 07034. (201) 927-0742.

EASTERN WHITE PINE, 20-bd.-ft. packages: ¾ in., $15.95; 1½ in., $19.95. Kiln dried, random widths, 3-ft. and 4-ft. lengths. UPS collect. Woodland Sawmill, PO Box 506, So. Casco, ME 04077.

FREE TURNING BLANK with each order. Details, send 50¢ for complete listing of turning stock. Cryder Creek Wood Shoppe, Box 19FA, Whitesville, NY 14897.

LUTHIER'S SUPPLIES: Imported tonewoods, tools, parts, accessories for violins, violas, cellos, basses and guitars. Catalog, 25¢. Credit certificate enclosed. International Violin Company, Ltd., Dept. A, 4026 W. Belvedere Ave., Baltimore, MD 21215. (301) 542-3535.

MAKE TOYS—Hardwood wheels, parts—catalog, 50¢. Cherry Tree Toys, 2547 8th St., Berkeley, CA 94710.

Cherry, oak, walnut—DOWELS, BUTTONS, PLUGS. 32 sizes bradpoint drills. Odd Ball Supply, Box 133, No. Attleboro, MA 02761.

Guitar, banjo, violin, mandolin-making materials, accessories, books, piano tuning kits. Catalog 50¢. INTERNATIONAL LUTHIERS SUPPLY, Inc., Box 15444, Tulsa, OK 74112.

SORBY TURNING TOOLS. Unhandled with ferrules. Other selected turning tools, supplies, General 260 and Myford ML8 lathes. Woodturning instruction. $1 (refundable) for all brochures. Russ Zimmerman, RFD 3, Box 57A, Putney, VT 05346.

JAPANESE WOODWORKING TOOLS since 1888. Free catalog. Tashiro's, PO Box 3409, Seattle, WA 98104. Recording telephone, (206) 323-7750.

Stanley #45 PLANES for sale. List $1. Incatec-AY, Box 654, Gresham, OR 97030.

Woodworker's Swiss Zyliss vise. Regular $138.50, special $89 postpaid. Bargain catalog, $1. Rego, Downing, Fall River, MA 02723.

FREE GUIDE to beautiful wipe-on wood finishing. General Finishes, Box 14363FC, Milwaukee, WI 53214.

Sub-miniature 6-piece WOOD-CARVERS TOOL SET $19.95. Also miniature, small, standard sizes. Palm push handles. Highest quality. Write Davis Fine Woods, 413 Chambers, Sioux City, IA 51101.

MOLDING PLANES: Beads, Ovolos, Ogees, Astragals and other shapes. For descriptive listing send 60¢ to Tools, Box 400004, Dallas, TX 75240.

OLD TOOLS for the woodworker and collector. Large variety and supply of quality old tools on hand. Send $2.50 for latest pictured catalog. Bud Steere, 110F Glenwood Dr., N. Kingstown, RI 02852. (401) 884-5049.

ANTIQUE TOOLS—Quarterly illustrated catalog—$6/yr. The Tool Box, 8219 Petersburg Rd., Evansville, IN 47711.

OLD TOOLS—planes, chisels, rulers, blades, more. Illustrated catalog, $2. John Treggiari, 67 Lexington Rd., Dracut, MA 01826.

Stainless steel and brass SCREWS AND BOLTS. Small quantities, free catalog. Elwick, Dept. 410, 230 Woods La., Somerdale, NJ 08083.

TUNG OILS, seedlac, shellac, resins, stains and dyes, waxes and more. Free price list and brochure. Woodfinishing Enterprises, Box 10117, Milwaukee, WI 53210.

"How PEG Helps the Hobbyist Who Works with Wood;" 25-page booklet; $2. BRANDY STATION, Box 78A-MA, RD 3, Corning, NY 14830.

700 PLANS. Indoor/outdoor furniture, accessories, toys, novelties, shop equipment. Your choice 5 plans included with purchase of 80-page illustrated catalog. Send $5 refundable to Mayco Sales, Box 2931FW, Mesa, AZ 85204.

GEARLESS CLOCKWORKS, wooden; complete plans, drawings, templates, $4. Clever secret jewelry box plans, $1. Candlepress, 1124-F N.W. 40th Ave., Gainesville, FL 32601.

CATALOG OF 200 WOODEN TOY PATTERNS, toymaking supplies, books. $1 refundable. Love Built Toys, F3, Tahoe City, CA 95730.

WATERBED PLANS, Catalog $1, refundable. Waterbeds by Mail, FW, 1657 E. Harbor Dr., Warrenton, OR 97146.

UNIVERSAL ELLIPSE JIG PLAN: High precision, easy to make and use. Draw, rout, inlay almost any size. Perfect concentric ellipse for mirror frames, tables. Never make another template again. $22. Dovetail Jig Plans: Make your own with a tolerance that surpasses the $150 models. $25. Jigs, 544 Loleta La., Novato, CA 94947.

TABLE KIT for woodworkers: detailed plans and instructions for 8 different tables with necessary lumber for any one—selected, KD, solid American cherry, S4S, $69 plus $10 handling and shipping. Plans only, $9.50. TuggleWood, Dept. FW, PO Box 21436, Louisville, KY 40221.

HARPSICHORD KITS: Extraordinarily fine historically derived instrument designs, precut parts, factory direct prices. Feder Harpsichords, Box 640, Killingworth, CT 06417.

Catalog of wooden toy patterns, wooden toykits and toymakers' supplies. Send $1 to TOY DESIGNS, PO Box 441-F, Newton, IA 50208.

BENCH BRUSH. Combination horsehair/synthetic for dust and shavings. Guaranteed. $9.95 ea. or 2 for $19 postpaid. Send check or money order to Renn Assoc., 6222 52nd Ave. N.E., Seattle, WA 98115.

Personalized BRASS NAME PLATE. 2-line sample, $1. VB, 807 East Dana St., Mt. View, CA 94040.

GOLDLEAF, sheets, rolls, supplies, tools, technical literature. Art Essentials, Ltd., Box 260, Monsey, NY 10952.

WOOD & TOOL EXCHANGE

For Sale

Boxwood logs 3-in. to 8-in. dia., 15 in. to 4 ft. long. $2.50 per lb. FOB. 1948 Viento Verano Dr., Diamond Bar, CA 91765. Will cut to approx. length. SASE for inquiries to Hal Metlitzky.

Stanley planes: #112, good $30; #87, good $20. German #112, new $25. Set 6 English bvl.-edge box-hdl. chisels, new $25. #143A Yankee handdrill, new $15. Box 82, Oakmont, PA 15139.

Ebony and plainsawn rosewood sizes 1½ in. wide by ⅜ in. thick by 6½ and 8 in. long. Would like to unload lots of it fast. Box 32, Haddon Hts., NJ 08035. (609) 546-2903.

Stanley #45 planes: Complete, good condition. 1897 Model, 18 cutters, $80 ppd.; 1905 model, 20 cutters, $100 ppd. Other planes and tools. A. Knapp, 300 Kasson Rd., Camillus, NY 13031. (315) 488-5701.

Stanley miter machine. Never used. Deltagram hardbound books #1 to 4. Rockwell—Flying Chips magazines complete. Best offer takes all. FOB. Paul Schaeffer, Schoharie, NY 12157.

$\frac{5}{16}$-in. by 3-in. hanger bolts, 8¢ ea.; steel corner braces 2 in. by 4½ in., 15¢ ea. E.B. Brown, 2 Sylvan Rd., Verona, NJ 07044. (201) 239-5446.

Stanley #45 very good condition, 23 cutters, used very little, $125. Dave Spring, 3806 Rolf Dr., Tallahassee, FL 32303.

Stanley #55—all parts and blades, $405. (812) 867-6219. J.A. Moody, 8219 Petersburg Rd., Evansville, IN 47711.

Wanted to Buy

Old Delta table-saw parts. Tilt-top model. Saw body part NCS 20, bearing housing parts NCS 90, NL 301, NCS 91. Tilting mechanism no.??. Monte Becker, Box 794, Vineyard Haven, MA 02568.

Seeking open time on a small time-saver-type thickness sander to sand ⅛-in. thick, 3½-in. by 7-in. pieces to $\frac{3}{32}$-in. thickness. Box 32, Haddon Hts., NJ 08035. (609) 546-2903.

12-in. jointer, would consider a 10-in. B. Hammond, 1405 Anderholt Rd., Holtville, CA 92250. (714) 356-2681.

SITUATIONS WANTED

High-school Woods teacher—see table in Design Book Two—seeks position in restoration, reproduction or contemporary furniture. Ivan Hass, PO Box 365, Ashland, KS 67831. (316) 635-2842.

Desire apprenticeship with Master Woodworker. Some experience plus 2 years college woodworking training. Will relocate. Jim Nieman, 620 Elmwood, Marshalltown, IA 50158. (515) 752-6165.

Skilled craftsman, Findhorn (British) trained. Cabinet/carpentry experience. Returning to U.S., interested in high-quality work. Will relocate. Shelley Drogin, Kings Pt., Normandy A4, Delray Beach, FL 33445.

Cabinetmaker apprenticeship sought. Have two years experience, some tools. Interest in cabinet/lathe work. Will relocate. Bill Henricks, 618 Sheridan St., Dolton, IL 60419. (312) 841-5935.

The CLASSIFIED rate is $3 per word, minimum ad 15 words. Payment must accompany order. The WOOD & TOOL EXCHANGE and SITUATIONS WANTED rate is $2 per line, minimum three lines, maximum six lines, limit two insertions per year. Allow 30 letters or spaces per line, including name and address. The Wood & Tool Exchange and Situations are for private use by individuals only. Commercial accounts must use Classified. Please inquire for DISPLAY CLASSIFIED rate. Send to: The Taunton Press, Advertising Dept., Box 355, Newtown, CT 06470. Deadline for the May/June issue, Feb. 25th; for the July/August issue, April 24th.

Macassar ebony cabinet with mother-of-pearl and abalone inlay, 1927, adapts aspects of furniture of the Louis-Philippe period to which Süe and Mare were most attracted. These include the use of large veneered surfaces and decorative motifs in a piece of scaled to suit the intimate setting of the boudoir, for which it was designed. Yet the piece is modern, playfully anthropomorphic: the rounded shoulders, the broadening at the hips, the winged legs, the hooved feet. The legs, extending to the corners, and the cornice are solid Macassar; they are joined to veneered side panels (Macassar over oak ground) that curve in two planes, as do the two veneered doors. The insides of the doors have full-length mirrors (the cabinet is 61⅛ in. tall), and the interior includes a compartment and drawers in pink and black lacquer.

Süe and Mare

Decorative inlay connects past to unorthodox modernism

by Roger Holmes

Decorative art has had a rough passage through the twentieth century. Modern life, so we have been told, requires efficient, functional, democratic furniture. Decoration is at best frivolous, at worst immoral, tainted by association with socially discredited historical periods. Even sumptuous furniture must project a serious, responsible image, decoration being allowed only if it is inherent in the material or the structure. This has been the orthodox modern writ, though its performance has often strayed wide of the mark. Yet when the uncompromisingly decorative furniture illustrated here appeared in the 1920s, it not only claimed to be modern, but was enthusiastically received as such. The French Art Deco style was, for a time, *the* modern style. Louis Süe and André Mare were among its most successful practitioners.

Unlike the orthodox modernists, Süe and Mare did not reject the past. Instead they based their work on historical precedent in conjunction with contemporary modern art, a daring and not altogether successful formula. Their starting point was the furniture of the Louis-Philippe period, whose development was cut short by the revolutions of 1848. After the first quarter of the nineteenth century, the severe, monumental classicism of the Empire style was softened in response to the demands of a growing and affluent bourgeoisie who wanted practicality, pleasant appearance, adaptability and comfort. The middle class of the 1920s echoed these demands as it sought a return to comfort following the upheavals and deprivations of World War I.

Nineteenth-century stylistic influences can be seen in the cabinet shown above. Its Macassar ebony skin, which permits the contours to flow unbroken from surface to surface, provides a suitable backdrop for the central floral motif in mother-of-pearl and abalone. During the first half of the 19th century, similar broad surfaces of uniform color were employed to set off applied ormolu (gilt bronze) decoration. Ormolu mounts, used on several of their major pieces, and tightly figured or straight-grained exotic woods were adapted directly by Süe and Mare from the earlier period. Likewise, their admiration for the superb craftsmanship of the 18th-century *ébénistes* is reflected here, particularly in the skillful veneering. The furniture of Emile-Jacques Ruhlmann, a designer and contemporary of Süe and Mare who shared their ideals, achieved a restraint and repose perhaps more in keeping with the examples from classical antiquity admired by the 19th-century designers. Süe and Mare's furniture was more aggressive and flamboyant, less strictly classical, possibly as a result of the second major influence on their work—modern art.

Both men had been active painters in Paris before the war. Süe (also an architect) had worked with the fashion designer Paul Poiret, famous in high society for his lavish decorative schemes and extravagant parties. Mare was engaged in an attempt to "revitalize the decorative arts" and, with the Duchamp brothers, Ferdinand Léger and others, staged the controversial Maison Cubiste exhibit of 1912. In 1919 Süe and Mare formed the Compagnie des Arts Français, with the intention of blending the various talents of architects, craftsmen and artists to produce furnishings with the rigor of architecture and the spontaneity of painting.

The bold marquetry picture on the doors of the large commode, facing page, top right, demonstrates this second influence. Again the unbroken surfaces of the ebony-veneered carcase serve as a backdrop; the highly figured marble top is

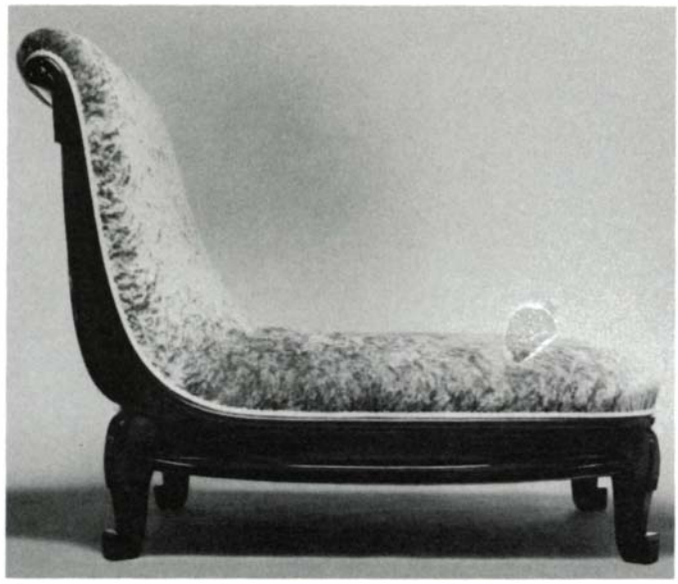
Photos: Courtesy the Foulke-Lewis Gallery, London

also reminiscent of the nineteenth-century style. But this is not, to my mind, a successful piece. Ponderous and awkward, its various elements vie with one another for attention. The brightly colored marquetry so dominates that the commode itself is reduced to the role of an elaborate display stand.

If we look at the ebony cabinet once again, we find greater harmony between decoration and function. The stylized plant forms of the carved legs and cornice reinforce the central floral motif, while providing balance and resonance. Moreover, as they are decorative abstractions, we are more likely to accept their additional role as structure. The golds and pinks of the mother-of-pearl bring out the color in the ebony, providing a subtle harmony. The floral motif is carried throughout the piece in a logical, unified design.

Süe and Mare's most successful furniture exhibits a similar order, clarity and consonance. It balances historical precedent with artistic originality; it is luxurious without being vulgar. Pictorial decoration can, as the commode demonstrates, make these syntheses difficult. As a separate art work, the floral inlay is less interesting than the commode's marquetry panels. But it enhances the cabinet, which returns the favor. The marquetry, a modern composition in vivid color, fails as decoration perhaps because of its strength as a separate work of art. It overpowers the commode; there is no unity of design.

Süe and Mare's period of such assertive decoration was brief, but it coincided with the most important event in the decorative arts of the 1920s—the 1925 Paris Exposition of Decorative Arts, at which they were immensely successful. The exhibition had been organized by the government to reestablish France as international exemplar of good taste and leader in modern design, the position it had held in the early nineteenth century. The Germans, whose Bauhaus was emerging as the leader of the opposing camp of modernism, were forbidden to enter. Not surprisingly, therefore, the exhibition was dominated by the French Art Deco designers (in fact, the name of the period was taken from the name of the exhibition). Joseph Breck, then curator of the Department of Decorative Art at New York's Metropolitan Museum of Art,



Cuban mahogany chaise longue, upholstered in crushed velvet, 1927, is an example of how Süe and Mare modernized design elements from the French ébéniste tradition. The lines are at once flowing and geometric. The volute that terminates the back is decorated with a carved tassel (not applied), as are the knees of the chinoiserie legs. The feet end in a geometric volute, a distinctive Art Deco touch.

Commode, 1925, is Macassar ebony veneer with gilt wood feet and black-and-white marble top. The doors, decorated with stained-wood marquetry, depict an underwater scene in bright shades of orange, yellow, blue and purple. The interior is fitted with drawers and shelves in bird's-eye maple stained beige.

thought Süe and Mare's work the best in the show, and he made their ebony and ormolu desk, which was the center piece of the Compagnie des Arts Français pavilion, his major purchase for 1925.

The 1925 Exposition established modern design in the public imagination, assisted by Hollywood's adoption of modern sets. It was Art Deco's high point, and the beginning of its decline. The work of Süe and Mare continued to develop; by 1928 the Deco floral motifs were giving way to plain surfaces and solid colors. Taste was moving toward the unadorned anti-historical style of the orthodox modern movement, though it didn't triumph until the late 1930s.

Point by point, the furniture of Süe and Mare contradicted the orthodox modern ethic. Its simplicity was elegant but contrived, achieved through artifice. Its structure was hidden. It used traditional, expensive materials, assembled by laborious hand methods. And it was highly decorative, individualistic furniture that only a tiny elite could afford. Yet it was modern—a romantic modernism not unlike Hollywood's, where similar, though intangible, fantasies were on offer in every movie house at prices everyone could afford.

Süe and Mare dissolved their partnership in 1928. André Mare returned to painting; he died, while still a relatively young man, in 1932. Louis Süe continued to design and practice architecture throughout his long life, becoming more interested in establishing a "new classicism" in architecture. He died in 1968, at the age of 93.

The economic boom following World War II brought with it an end to the domination of the furniture trade by craftsmen of the old school upon whom designers like Süe and Mare depended. Echoes of the ideals of the Compagnie des Arts Français can be found occasionally in designs of the 1950s and 1960s, but the dominance of the orthodox modern movement has been almost complete. One of the few links with the world of Süe and Mare is the growing number of designer/craftsmen in Britain and the United States. Working on a much more restricted scale, usually in small workshops and alone, these people are producing pieces that strive for the quality, if not the specific style, of Süe and Mare and other designers of the 1920s and 1930s. □

Roger Holmes, an American writer living in London, is a regular contributor to Fine Woodworking.

How Inlay is Made

Commercial techniques for marquetry inserts and banding

by Rick Mastelli

Traditional designs for marquetry inserts include fans, sunbursts, shells, urns, American eagles and floral patterns. They are often round or oval in perimeter, bordered by a thin strip bent around and joined, or by a thin ring cut whole from a sheet of veneer. Within the border can be any number of individually sawn pieces set into a figured background veneer of the same standard thickness. The pieces are often shaded by scorching in hot sand to give the picture the illusion of depth. Once assembled, the marquetry insert can become part of a veneered surface or be let into the solid surface of a box or piece of furniture by routing a recess slightly shallower than the thickness of the insert (for how to do this, see *FWW* #17, July '79, pp. 68-69). The other sort of commercially available inlay is banding, used to decorate the borders of drawers, doors, panels and tabletops. Also 1/20 in. to 1/28 in. thick, it's typically patterned in repetitive geometric shapes and sold in 36-in. lengths of various widths.

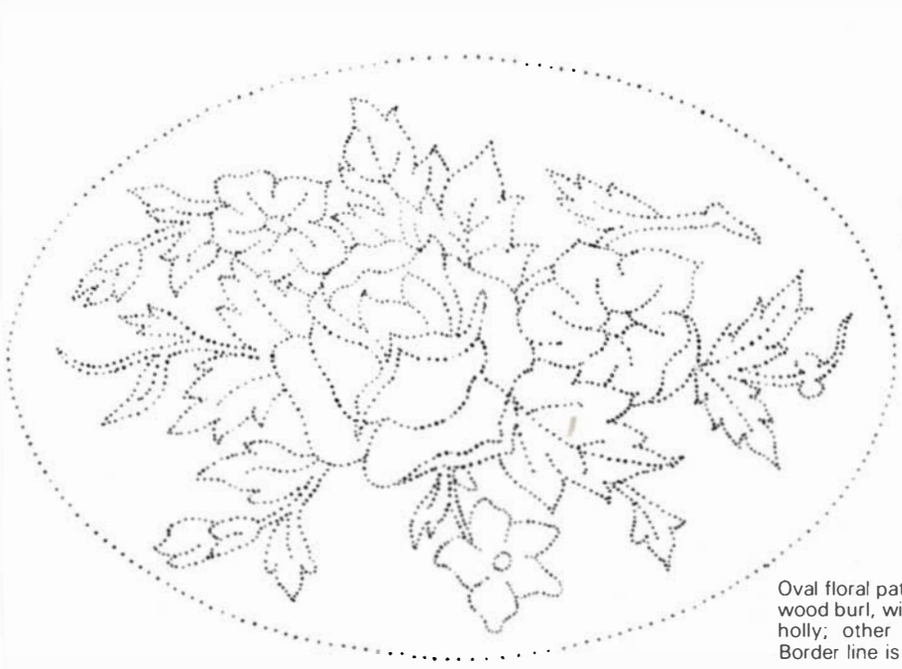
Marquetry inserts at Dover Inlay like the sunburst, top, are assembled on a light-tack tape. Above, an American eagle in all its parts.

There used to be many manufacturers of banding and marquetry inserts, but few survived the Depression and War years. Now there are only Danker Marquetry in Traverse City, Mich., Inlaid Woodcraft in Kirkland, Ill., Dover Inlay in Mineola, N.Y., and Jason French in West Chelmsford, Mass. Together these four supply the period-furniture industry, the mail-order woodworking supply houses, the individual craftsman, and the reproduction and restoration specialists with traditional and custom-made inlay. I visited Jason French and Dover Inlay, and I discovered that both shops make inlay today pretty much the same way it's been made for more than a hundred years. They still use a perforated paper master to make multiple pounce patterns, which they cut into the individual elements of each design. They glue these pattern elements to stacks of up to 30 veneers, and jigsaw the whole stack at once. The pieces that require shading are scorched in frying pans of hot sand, and the inserts are assembled by hand, one at a time. There's nothing sophisticated about the equipment (except at Inlaid Woodcraft, which has recently introduced a woodcutting laser). Inlay still comes from an artistic eye and a patient hand. These firms have the experience and the panache to execute traditional designs in quantity, but their methods are straightforward—you can apply them to any sort of design, in any quantity.

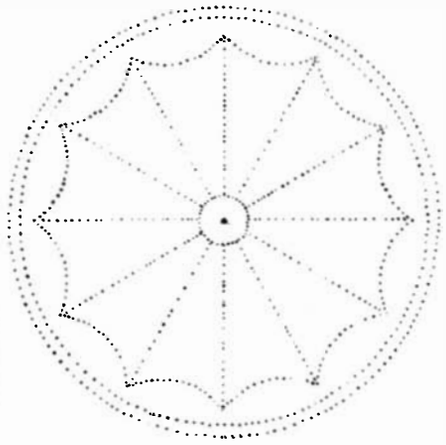
Jason French, 63, has done marquetry since he was a boy. His father, upon graduating from high school, went to New York City to learn cabinetmaking, whereupon he discovered inlay. He returned to Cambridge, Mass., in 1905 and opened his own shop, soon specializing in inlay. Jason has been a watchmaker and modelmaker, but he always worked nights and weekends in his father's shop. In 1968, Jason took over the business; he's not been without work since. He works with his wife, Violet, who does most of the assembly and the shading, while he designs and saws. It's very much a cottage industry on the second floor of their backyard garage. Their simple machinery consists of a Rockwell jigsaw, a Powermatic 10-in. table saw (fit with a thin-rim veneer blade), a Delta drill press and a Craftsman 12-in. bandsaw. French's pride is a 4-ft. by 13-in., 5-screw veneer press, and the thousands of feet of various woods he has squirreled away, "everything from aspen to zebrawood," he tells me.

Dover is a larger operation, though it is also a couple of generations old (established in 1919) and still works in traditional ways. It's owned and operated by Paul and Don Boege, father and son. They've experimented with various alternatives to jigsawing, the most skill-demanding part of making inlay, but die cutting, they found, leaves a beveled edge on the parts, visible as a gap in the finished design, and the laser wasn't cost-effective for the scale of their operation. They employ three people on jigsaws, including Don Boege, and at

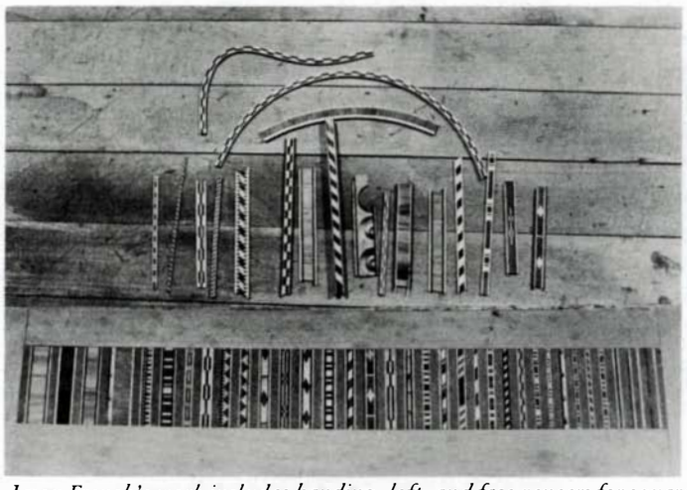
Full-size pounce patterns for popular designs, from Jason French



Oval floral pattern: usually a background of walnut or redwood burl, with various shades of green for leaves. Rose is holly; other flowers are korina, satinwood and pink. Border line is holly. (See front cover for finished insert.)



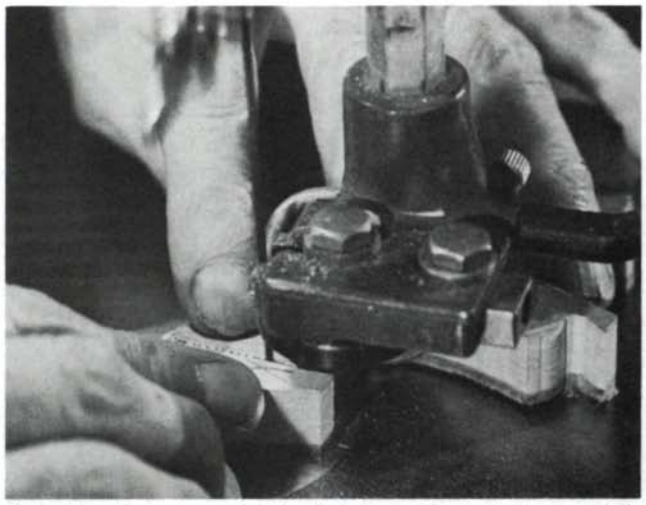
Round sunburst: twelve segments in shaded holly or satinwood with black or mahogany scallops and center to match.



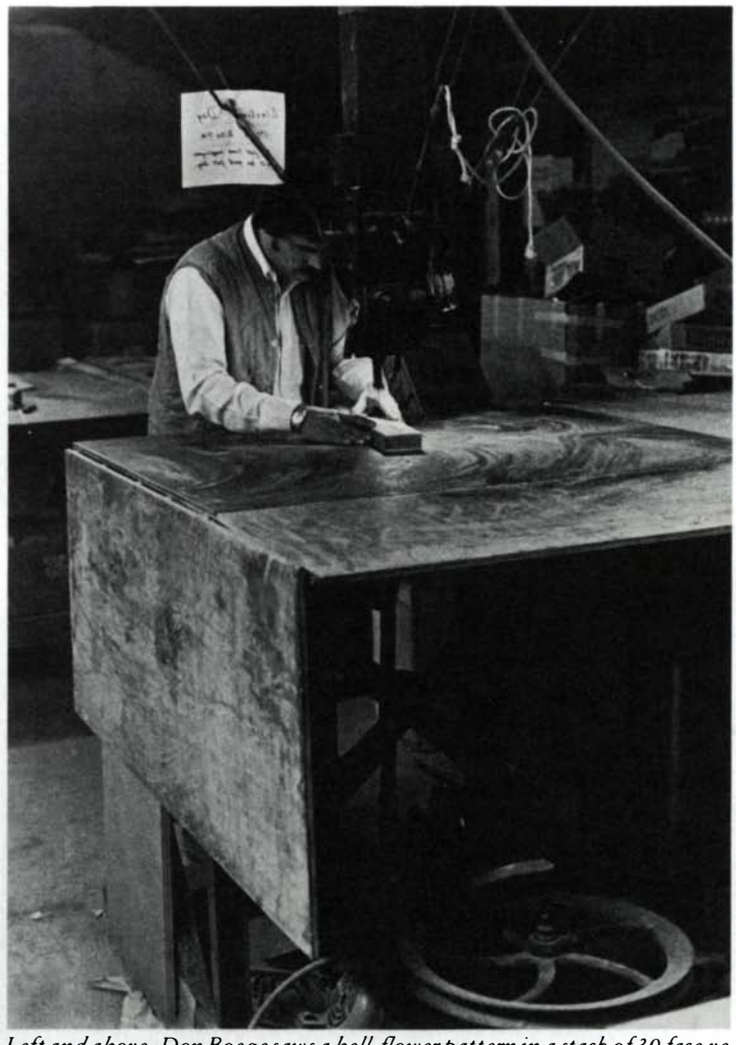
Jason French's work includes banding, left, and face veneers for square-tapered legs, right. Note that these are samples and that the leg veneers would run the entire length of the leg, including the border line, which is sawn.

least four people at the assembly bench. One-third of their 6,000-sq. ft. shop is devoted to storage, mainly 1/28-in. veneers, though there's also lumber for making into banding. Their machinery is only slightly more sophisticated than French's. Table-saw tops hinge up so blades can be changed without affecting arbor or fence adjustments, and their jigsaws are large, wooden-frame designs able to cut accurately a stack of 30 veneers at a time. The saws incorporate a clutch that saves turning off and on the motor to thread the blade through drilled holes for interior cuts. One jigsaw (shown on the next page) has an almost infinite throat, limited only by the walls of the shop, for instead of an arm from the base supporting the upper end of the blade, a post mounted and guyed to the ceiling extends down to within 12 in. of the table top. The blade, powered from below, is attached at its upper end to a spring in the post. They use this saw for cutting out bell flowers and borders in face veneers for square-tapered legs and other large assemblages.

At both the French and Dover shops, a marquetry insert begins with a pattern drawn on thin, 100% rag paper from which copies must be made; the number of copies depends on the intricacy of the design (adjacent parts require separate patterns cut from separate copies) and on the number of stacks of veneer to be sawn. The pattern must realistically anticipate the fineness and curvature of the cut their saws and sawyers can manage, and notations on it indicate what kind of wood each piece will be. This is a pre-zerox method that has the advantage of a durable master from which thousands of exact copies can be made (photocopies are usually a slightly different size from the original). If the pattern is symmetrical, the paper is folded and only half the pattern is drawn. Then the paper is perforated along the pattern lines with tiny holes, spaced as close together as possible. French uses a pin and pin vise, backing the paper with an even-grained, medium-density hardwood. Dover uses a fine needle stuck in a wooden handle. To make a copy, the perforated master is placed on the copy paper, and pounce, a fine asphaltum powder (French uses pulverized gilsonite from the American Gilsonite Co., 1150 Kennecott Bldg., 10 E. South Temple St., Salt Lake City, Utah 84133) is daubed up with a felt pad and



Jason French saws a sandwich of 16 veneers for fan inlay parts. The dotted line is pounce, a powdered asphaltum applied through perforations in the master pattern.



Left and above, Don Boege saws a bell-flower pattern in a stack of 30 face veneers for square-tapered legs. The jigsaw has an almost limitless throat because the top of the blade is attached to a spring in the ceiling-suspended post.

rubbed through the perforations. The copy is then carefully moved over a heating element (French uses an electric hot plate), which fixes the powder to the paper so it can't smear or blow off. The copy is then scissored into its individual parts, well outside the dotted line, and the parts are sorted according to what species of wood each will be sawn from.

French saws from 6 to 20 units at a time, depending on the run he is producing and on the delicacy of the cut—details will be cleaner from a smaller stack. He sandwiches the veneers between two pieces of plywood (¼-in. on top, ⅛-in. on the bottom) to prevent tear-out. The sandwich has to accommodate all the parts of the pattern to be cut from that type of wood. French hide-glues the pattern parts to the top of the sandwich and holds it together by driving brads through the waste areas, clinching them on the bottom side. Sawing is then a matter of care and skill. French tries to split the dotted line on both the individual parts and the background veneer to produce a good, snug fit. For most cuts he uses a Trojan #2 coarse blade, 0.085 in. by 0.020 in., 15 teeth per inch. "It says it's filed and set when you get it," he says, "but you can't believe that. I sharpen each blade before I use it, filing straight across. It takes me about two days to saw out all the pieces for a complex pattern in a run of 30, my usual number. The hardest cut in the book, though, is a long, straight line into a square corner, like on table legs."

Pieces that need shading are brought over to a sand-filled frying pan on an electric hot plate. The pieces are held in handmade wooden tweezers, two at a time, show-face out, and dipped into the sand for scorching. The edge is made darkest, fading gradually toward the interior.

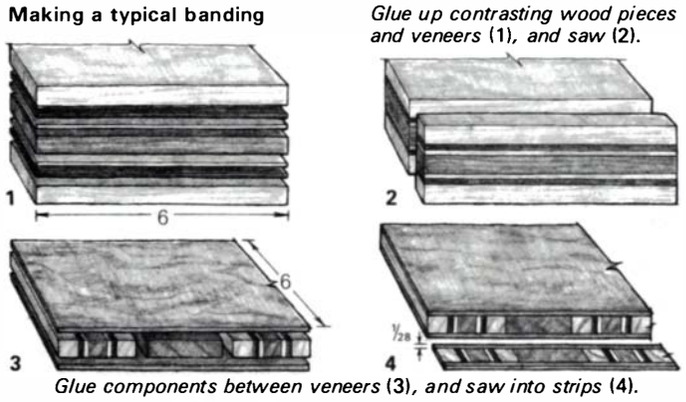
The piles of identical parts are then organized on the assembly bench around a sheet of newspaper. First the background veneer is tacked down with brads, show-face up. Then the point of a razor-knife spears each tiny piece, and a dab of hot hide glue on the newspaper holds it in place in the background. It's like assembling a jigsaw puzzle, tack-gluing each piece as the puzzle proceeds. When all the pieces are in place, French coats a piece of heavy brown paper with hide glue and lays it over the top. He presses the assemblages immediately with a wool rug for about an hour to make up for any unevenness. When the glue has set, the newspaper (under) side of each picture is moistened and scraped clean. A mixture of hide glue, water and mahogany dust is rubbed into the spaces between the pieces and into the sawn lines that represent detailing on the larger pieces. French uses the edge of a Teflon block to squeegee off the excess filler. The remainder is left to set while the pictures are kept flat under a heavy board. A finished insert will retail for anywhere from $2.50 to $20. If he did little else, French figures he could produce 50 to 75 inserts in a week.

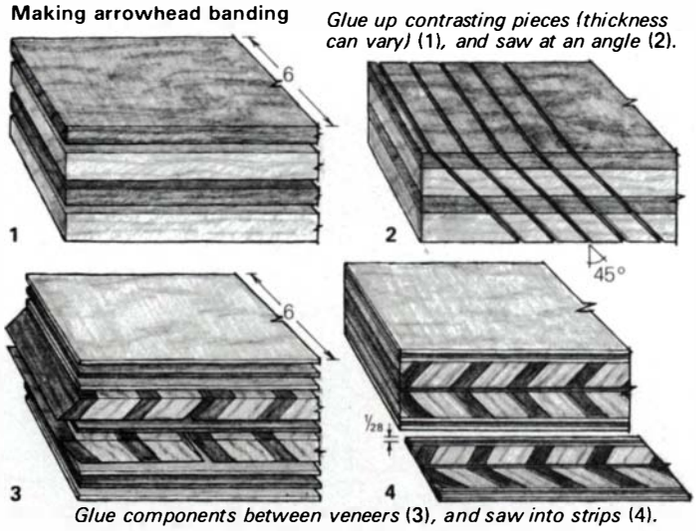
Dover Inlay can produce hundreds. Besides its larger staff, the firm has streamlined assembly by using, instead of hot

hide glue, two kinds of tape. Individual pieces are still speared, show-face up, and positioned with the point of a razor-knife, but instead of newspaper and glue, a ground of light-tack tape holds them in place. When assembly is complete, a gummed tape, similar to packaging tape, is placed over the show-face. The light-tack tape is removed from the back and a filler of water-soluble glue, water and mahogany dust is pressed in. With this method you don't have to tend the glue pot or contend with the wood curling from moisture taken on from the backing glue, and you don't have to clamp.

Banding is made entirely differently. Instead of tiny pieces assembled into finished units one at a time, a 36-in. long, 6-in. or 8-in. wide "trunk" pattern is assembled, and 1/28-in. strips are cut from it on the table saw, like slicing pastrami. Often what appears in the finished banding as tiny components is the result of an earlier generation of assembling and slicing larger pieces of wood or sheets of veneer. A typical design will begin with two or three pieces of contrasting veneer, 36 in. by 6 in., laid down with glue between. French prefers traditional hot hide glue because of its long assembly time; hot cauls applied to the assembly before it goes in the press reliquefy the glue. Dover Inlay uses Cascamite, and Danker Marquetry, the other large producer of banding, has switched to a slow-set Titebond. Next a series of 6-in. long sticks of complementary section, or a series of 6-in. long assemblages from an earlier gluing and slicing (parallelograms, say, from 45° cuts) are glued together and onto the veneer. Another two or three layers of veneer on top complete the sandwich, and the whole thing goes in the press for a day. When the assemblage is removed and sliced, the components will appear as arrowhead banding, bordered by thin lines, as in the drawing at right. With a veneer blade producing a 1/32-in. kerf, about ninety 36-in. long strips can be gotten from a 6-in. wide lamination. These sell for anywhere from 70¢ to $7 a yard. Hundreds of patterns are currently produced. "There's no end to inlay," says French, "because there's always someone coming up with some new challenge."

Both French and Dover have found that the demand for their products has increased in the last two years. This popularity seems to be part of a cycle that has gone on for as long as woodworking itself. Interest in decorating furniture alternates with the primary interest in constructing it. Medieval joiners, for instance, when they had satisfied the demands of their time for building in solid wood, devoted more and more of their energies to decoration. Carved designs *(FWW* #19, Nov. '79, pp. 80-82 and #22, May '80, pp. 48-50) were the most popular, but straight-walled recesses were also cut into solid wood surfaces, using a shoulder knife, and thin pieces of wood let in to describe floral patterns and religious pictures. This was the beginning of marquetry in the West. In some monastic orders, marquetry became an art in its own right, not wed to furniture as decoration, and wooden pictures came to rival oil paintings for their detail and realism. The invention of the fretsaw in 1562 took marquetry out of the domain of the artist and gave it over to the craftsman, who could follow designs prepared by more artistic hands than his own. The result was a decline in the quality of the pictorial images and an increase in their use as decoration. Throughout the ensuing era of the cabinetmaker, there can be traced an ebb and flow in the taste for decorating furniture with thin wood. At least part of the reason lies with the makers themselves. Newly challenged by the construc-





tional demands of a compound-curved surface, say, or a tambour door, the cabinetmaker is absorbed. After mastering the difficulties, he looks for more; he decorates, often by inlaying.

Contemporary woodworking seems not immune to this cycle. Since the end of World War II, when Danish designs became aligned with modern tastes, many people have appreciated solid, unembellished wood, and have been absorbed in constructing with it. Even in the period-furniture trade, Queen Anne and Chippendale have been far more popular than decoratively veneered Hepplewhite, Sheraton and Louis XV or XVI. Until recently, that is. Period-furniture manufacturers are now responding to increased interest in Federal furniture, typically decorated with banding and marquetry inserts. The mail-order companies that sell inlays (Constantine, 2050 Eastchester Rd., Bronx, N.Y. 10461; Craftsman, 1735 West Cortland Ct., Addison, Ill., 60101; and The Woodworkers' Store, 21801 Industrial Blvd., Rogers, Minn. 55374) are selling more these days. And recent gallery shows have included more inlaid work, reflecting the greater sophistication of contemporary woodworkers who have been in the trade long enough to have outgrown their image as the first wave of a resurgence in crafts. □

EDITOR'S NOTE: For more about marquetry and inlay, see *FWW* #1, Winter '75, pp. 33-36; #5, Winter '76, pp. 38-40; and #22, May '79, p. 76. The Marquetry Society of America publishes a monthly newsletter (940 N. Hamilton Ave., Lindenhurst, N.Y. 11757). Books on the subject include *The Art and Practice of Marquetry* by William Alexander Lincoln (London: Thames and Hudson, 1971), $5.95; *Modern Marquetry Handbook* ed. Harry Hobbs and Alan Fitchett (New York: Constantine, 1978), $7.95; and *Veneering Simplified* by Harry Hobbs (New York: Constantine, 1978), $6.95. All three are available from Constantine, 2050 Eastchester Rd., Bronx, N.Y. 10461.

Inlaying Mother-of-Pearl

Watching one banjo maker cut and fit a delicate design

by John Lively

Though most often found as decoration on musical instruments, mother-of-pearl inlays traditionally have graced a diversity of articles—furniture large and small, gunstocks and knife handles, walking sticks and billiard cues. Mother-of-pearl and its more colorful cousin, abalone shell, are sold in small, thin pieces (the box below lists some suppliers), that are quite abrasive, hence hard on tools, and extremely brittle. You can't just saw it as though it were maple veneer. A highly developed craft practiced by the Chinese as early as the 14th century, mother-of-pearl inlay was very popular among the 18th-century *ébénistes*, and it distinguishes the work of such 20th-century inheritors of that tradition as Louis Süe and André Mare (pp. 44-45).

To learn how to cut and inlay mother-of-pearl, I visited Richard Newman (whose banjo appeared in *FWW* #1, Winter '75) at his shop in Rochester, N.Y. He demonstrated the technique by cutting a stylized Georgian dolphin in pearl, then inlaying it into a piece of scrap ebony. Here's how he did it:

From his stash of mother-of-pearl chips, Newman selected one and pasted a paper cartoon of the sea beast on top of it. Next, he clamped his bird's mouth (a rectangular block with

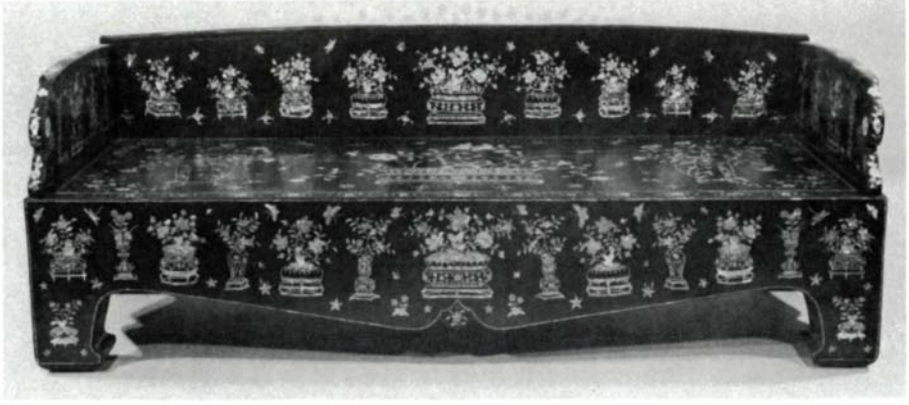
Sources of supply for mother-of-pearl and abalone

Mother-of-pearl does not come from the oyster that produces seed pearls, but from various bivalve mollusks, some of which grow as large as 2 ft. in diameter. Most pearl shell is imported from the western Pacific; the cold waters of Australia produce the finest shells, less likely to be damaged by sea worms, barnacles or other parasites. Colors range from white and grey to pink and deep gold; gold pearl, from the lip of the shell, is the most expensive cut. Some pieces of pearl are preferred for their evenness of color; others are irridescent and highly figured, sometimes designated wavy or fiddleback after the wood figures they resemble.

Abalone is cut from the shell of a monovalve mollusk native to southern Californian and Mexican waters. It is generally more spectacular than pearl, with black fracture lines along twisting planes of bright colors that blend and shift under changing light. There is green abalone, which has become rare, and there is larger, less expensive red abalone. The central portion of the shell, where the muscle attaches, is called the heart and is most prized. It looks something like crinkled tinfoil, sparkling with green, blue and red.

Suppliers cut mother-of-pearl and abalone with a lapidary saw, attending to the figure and curvature of the shell. The pieces are irregularly shaped, usually about 1 in. square (a 3-in. piece is considered large). Then they're ground to thicknesses ranging from 0.035 in. to 0.060 in. The thicker stock is best for curved surfaces, like fretboards, and for fine lines and sharp curves. Some suppliers grade their stock "select" (for exceptional figure and size), "#1" (good and clear), and "#2" (some parasite damage). Cost is figured by the ounce, $15 to $25 an ounce being typical. Some suppliers, as indicated below, will custom-cut designs; some provide precut blanks in a limited number of designs. —*Arthur Sweeney*

Arthur Sweeney is a professional stringed-instrument maker. He lives in Napa, Calif.



Chinese k'ang *(a type of bed) from the Ming dynasty (1368-1644) exemplifies the sophistication of mother-of-pearl inlay work before it became popular in Europe. Metropolitan Museum of Art, gift of Mrs. Jean Mayzē, 1961.*

Suppliers:

Erika, 12731 Loma Rica Dr., Suite G, Grass Valley, Calif. 95945. Mother-of-pearl and abalone blanks.

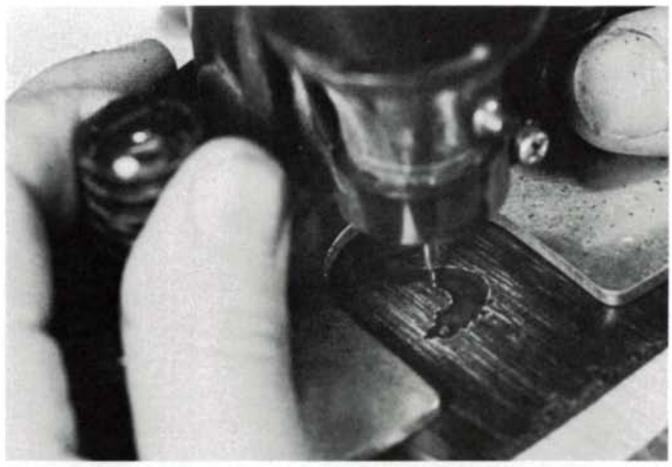
Handy Trading Co., 8560 Venice Blvd., Los Angeles, Calif. 90034. Mother-of-pearl and abalone in bulk.

Pearl Works, Larry Sifel, Rt. 3, Box 98B, Mechanicsville, Md. 20659. Mother-of-pearl and abalone blanks; precut designs; will custom-cut designs.

Vitali Imports, 5944 Atlantic Boulevard, Maywood, Calif. 90270. Mother-of-pearl blanks.

David Russell Young, 7134 Balboa Boulevard, Van Nuys, Calif. 91406. Mother-of-pearl and abalone blanks.

Zaharoff Industries, 26 Max Ave., Hicksville, N.Y. 11801. Mother-of-pearl and abalone blanks; will custom-cut designs. □



Very fragile and brittle, pearl must be sawn with a studied technique and special care. Left, with jeweler's saw and bird's mouth (the V-notched board clamped to his bench), Newman cuts a mythical sea beast from a mother-of-pearl chip. Top right, Dremel equipped with a tiny end mill routs the recess for the pearl inlay. It must fit easily, but with no gaps. Center, Newman uses an engraver's block to hold the stock when incising detail into the pearl. Engraver's blocks are necessary for good results, since engraving requires moving the work into the tool rather than the other way around, as is the case with carving wood. Engraved gouges filled with epoxy/aniline dye mixture delineate details and add depth to the finished dolphin (about twice actual size), right. Newman used black dye, but other colors would work as well.

a V-notch cut in one end) to his bench. With jeweler's saw in hand, handle up, teeth down, he proceeded to cut around the shape of the beast, using a #3 jeweler's blade (photo, above left). Sometimes moving the pearl into the blade and sometimes moving the blade into the pearl, his easy sawing rhythm kept the blade from binding, which, had it occurred, would have fractured the pearl. Rhythm, he told me, is especially important when sawing tight curves, because interrupting the up-and-down motion can snag the blade, chip the pearl and ruin the whole job.

While sawing away, Newman pointed out that pearl dust is toxic and said you should blow the dust away from your face. He uses a respirator when sawing it for extended periods, and warns that lung damage can result from inhaling too much of the powder. To saw the sharp points on the tail and pectoral fins, he always cut from the outside in, sawing out little loops in the waste part of the pearl to make space for a new angle of attack. This part of the job was slow-going, but the tedium paid off. The finished dolphin required only a few deft touches with a needle file to make its profile precisely right.

To prepare the ebony for inletting, he glued the pearl dolphin on the surface with Duco quick-dry cement. Then, carefully, he traced around the figure with a sharp machinist's scribe, deepening the scratch a little at a time until the outline was clearly visible. Tracing complete, he slid a razor blade under the pearl and popped it free, leaving its silhouette behind. For routing out the area for inletting, Newman used a 2-flute, single-end micro-miniature end mill with a ⅛-in. shank (available from the Woodson Tool Co., 544 W. 132nd St., Gardena, Calif. 90248). The bit was mounted in a Dremel Moto-Tool equipped with a router base (photo, top right). Newman set the depth of cut slightly shallower than the thickness of the pearl. This end mill will cut a channel as narrow as 1/32 in., thus minimizing the areas that will need to be filled in later at sharp corners.

It took a little trial fitting and re-routing to make the pearl drop neatly into place. Next, Newman applied silver leaf to the back of the inlay, and then he mixed a pinch of ebony sanding dust into a batch of five-minute epoxy (full-cure epoxy is better), smeared some into the recess and inserted the dolphin, pushing down gently and letting the epoxy/dust mixture ooze out slowly. He covered the inlay with plastic wrap and clamped a block on top of it. After 30 minutes drying (the epoxy has to set hard), he removed the block and

Newman saws mother-of-pearl the traditional way.

filed, scraped and sanded the whole business flush with the surface of the wood. Whatever gaps there were between the pearl and the wood (I saw only a speck or two) had been neatly filled with the dust/epoxy mixture.

Sanding, of course, made powder of the original cartoon. But he had lots of them on hand (they're photocopies of his original drawing) and got another out to use as a guide for penciling on the blank form all of its details—eye, scales and frilly gill. To engrave these little details into the beast's surface, Newman secured the wood in an engraver's block (photo, previous page, center). Unlike carving wood, where one moves the tool into the work, engraving calls for moving the work into the tool, which is held almost stationary. The engraver's block, with its heavy hemispherical base, is designed for this. You can order one from Brownell's Inc., Rt. 2, Box 1, Montezuma, Iowa 50171, or from Paul H. Gesswein Co., 235 Park Ave. South, New York, N.Y. 10003. With a square high-speed steel graver, Newman incised the details into the pearl. You can engrave pearl without an engraver's block, but it's not easy. You'll have to clamp and reclamp the stock to your bench because you will need both hands to control the tool, and your avenues of approaching the work will be limited, since you must lock your arms to your sides and move your whole body into the cut.

With the engraving done, Newman made another epoxy puddle, mixed in powdered black aniline dye and spread the inky stuff over the entire surface of the pearl, filling in the engraved areas. When the mess had dried, he sanded it down flush with the surface of the wood. Upon lifting the sanding block and wiping the dust away, some three hours after taking saw in hand, there lay the finished dolphin, its incised features boldly alive and vividly defined. □

Inlaid lap desk

Photo: Dave Murphy

This lap desk took Larry Robinson of Petaluma, Calif., 100 hours to make. It's of crotch and curly maple, bordered by ebony and inlaid with some 400 pieces of various woods, metals, and other materials, including crushed blue glass, crazy-lace agate, ivory, mother-of-pearl, abalone and opal. Robinson says he uses cyanoacrylate (Crazy) glue because it adheres to anything and it dries clear and free of the bubbles that characterize many epoxy mixes. He prefers to work with relatively thick materials (⅛-in. wood and 18-ga. to 20-ga. metals) because they're easier to saw and less likely to sand through than thinner stock. After sawing with a 4/0 or a 6/0 jeweler's blade, he tack-glues the pieces to the surface to be inlaid and scribes, then highlights the outline with chalk dust before routing. Combining various materials requires that the least dense ones be thickest and that all the pieces sit flush on the bottom of the inlay cavity, so sanding can bring their top surfaces flush.

A Jigsaw for Cutting Delicate Stock

Treadle power and spring return are ideal for pearl inlay

by Ken Parker

Cutting mother-of-pearl and abalone is difficult at best. The material is abrasive, very hard, brittle and rife with natural faults. As I stubbornly tried to saw out my signature, it became apparent that I didn't have the right tool.

Usually, pearl is sawn by hand with a jeweler's saw, against a bird's mouth (see p. 51). Any skewing of the fragile blade may snap the pearl. Furthermore, a small piece is hard to hold flat with one hand against the lifting force of the return stroke. As you struggle to control the cut, hold the work and keep the stroke perpendicular, tension builds quickly and it's easy to apply forces that exceed the material's strength.

Sawing pearl in a power jigsaw presents different problems. Typically the slowest speed is much too fast and the stroke too short; instead of cutting efficiently, the sawteeth slide against the pearl, overheating and dulling quickly. Lubricating with light oils or beeswax to keep cutting temperatures lower and to ease the work obscures the cut with pearl-dust sludge and loosens the glue holding the paper pattern.

Industry uses small, template-controlled overhead pin routers to produce elaborate inlays in guitars, banjos and other stringed instruments. The single-flute, solid-carbide cutters are air/mist cooled and spin as fast as 100,000 RPM. But besides the prohibitive cost of such machines for the individual craftsman, these routers are still unable to make the finest cuts. A 4/0 jeweler's saw, for example, takes a 0.008-in. kerf, while router bits are usually 0.022 in. in diameter. Thus hand-cut pearl can have sharp inside corners that machine-cut pearl can't.

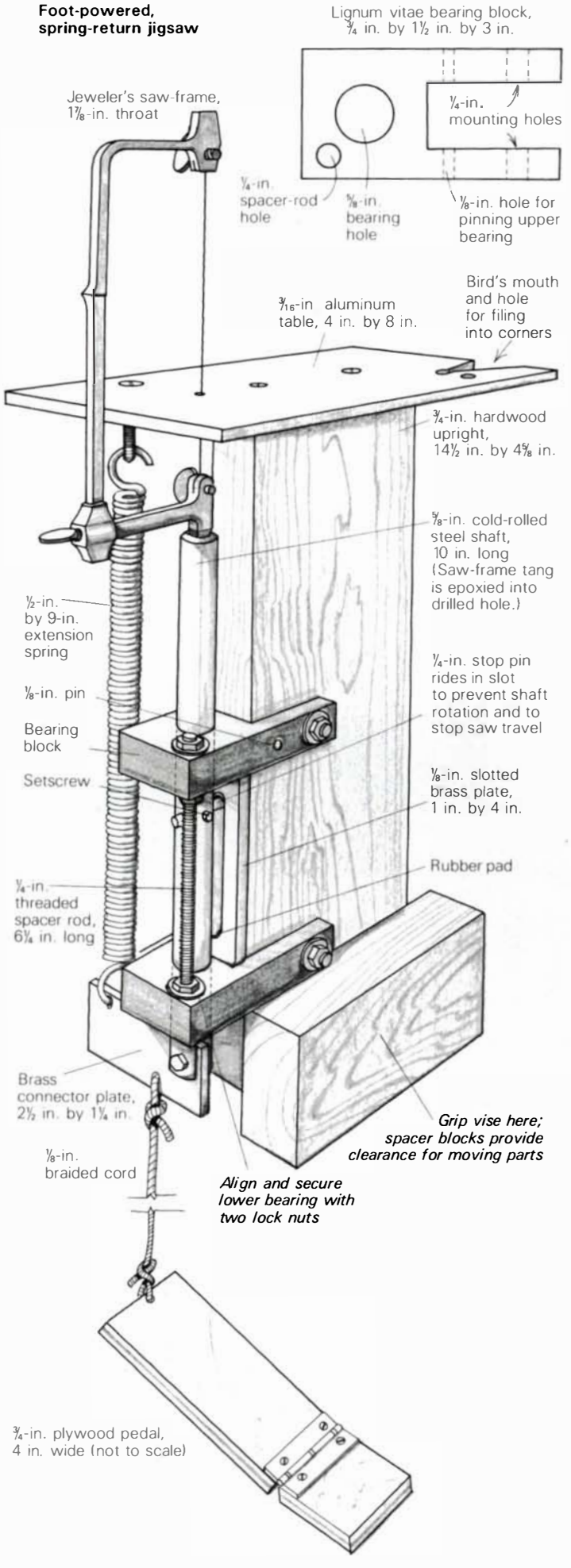
My solution is the foot-operated saw shown here. It is simple to build and has some important advantages for cutting pearl. It can be used as well for cutting veneer, especially for marquetry, though you would probably want to add a flywheel and rocker treadle for momentum. (An old Singer sewing machine has a design worth adapting, or see *FWW* #15, March '79, pp. 60-64). Foot power in my pearl-cutting saw is direct, and the return stroke is by way of a spring. The blade can thus be stopped instantly to prevent a strained piece from breaking. I clamp the upper part of the saw in my bench vise with the table at chin height. This provides good visibility and a relaxed posture; note that the teeth face the operator and the saw frame is behind the work. I rest my elbows on the bench and my chin on the table, blowing dust away with every stroke. There are two hands free to hold and maneuver the work, and the small table allows me to grip tightly, fingers on top and thumbs underneath.

Before describing the construction of the saw, some general remarks on cutting pearl: Use the largest blade possible for the contour you have to cut, and replace the blade before it gets dull, saving it for less critical work. As with all saw or file cuts in hard or tenacious material, the tool must move slowly enough to take a maximum cut per tooth. Excessive speed produces friction and dulls the saw while cutting very little, as the teeth do not fully engage the work. Feel each tooth dig in and cut and the job will go surprisingly quickly.

It's best after pasting your paper pattern on the pearl (I use mucilage) to drill a hole at one end.of the design and work from there instead of sawing in from the edge of the pearl. This provides support around the design. Try to cut exactly outside the pattern line. The only filing necessary should be on inside corners and at the ends of cuts. Jeweler's sawblades begin and end with graduated teeth. By using the top ¼-in. of the blade when turning tight corners, the "broaching" action aggressively chops out the waste and gives the blade room to turn. Furthermore, the extra rigidity at the blade end aids in accurate turning.

Construction—Begin with a rigid saw-frame. It is essential that there be no side play because racking strain can shatter

Foot-powered jigsaw designed especially for cutting delicate mother-of-pearl and abalone is mounted in the bench vise. A drawing of Parker's jigsaw appears on the following page.



the fragile pearl. The best style of saw-frame has a square shaft for a back member; its blade is tensioned by a thumbscrew. I used a jeweler's saw-frame with a 1⅞-in. throat, which can be had from a jeweler's supply house, as can an assortment of blades.

The tang of the saw-frame is mounted in a ⅝-in. cold-rolled steel shaft (more on that later) and the shaft slides up and down in a pair of bearings attached to a hardwood upright. Lignum vitae works beautifully for these low-speed bearings. It is easily sawn and drilled, it is hard and resistant to abrasion, and it is naturally oily, though I keep the bearings moist with mineral oil when the saw is in use. Saw the outside dimensions carefully to minimize the need to true up the lignum by hand; it will dull all but the toughest edge tools. Seal freshly cut surfaces immediately with tung oil or wax to prevent checking that will ruin the part.

Spade bits are convenient for drilling the ⅝-in. bearing hole because they can be filed to size. Test-drill in a scrap of lignum, coat the inside of the hole with mineral oil and see if you still have enough clearance. The oil will cause the wood to swell and make the hole minutely smaller. To get a clean cut, clamp the work and use high speed and slow feed. Once you have a good fit in a test block, prepare the two bearing blocks for drilling by stacking and gluing them together with a dab of 5-minute (weak) epoxy or paper and white glue between; assembly and alignment will go smoothly if the blocks have been squared, drilled and slotted precisely. Drill the ⅝-in. and ¼-in. vertical holes and saw the slots. Cross-holes for the mounting bolts may also be conveniently drilled before the blocks are split apart. Do not drill the ⅛-in. hole in the upper block at this time; it's more precise to drill and pin the block after it's mounted on the upright. Be sure to witness-mark the blocks to preserve alignment.

For the upright, use a piece of stable, straight-grained hardwood. Warping here can impede the saw's action. Thickness the stock, and square the edges and ends accurately. Spacer blocks are added later, as shown in the drawing, to provide clearance for moving parts when the saw is gripped in the bench vise.

This is the end of the woodworking part of this project. If you have never worked with metal before, you will benefit from the following primer. You'll be surprised to discover how nicely some of your woodworking tools will handle metal.

Sawing—At least two teeth in the work, as usual.

—*Steel*: Hacksaw; use heavy cutting oil; slow, even strokes.

—*Aluminum*: Bandsaws beautifully with standard woodcutting blades; light cutting oil or kerosene may be used for heavier cuts; wipe tires dry after cutting.

—*Brass*: Bandsaws well; use dull blade; do not lubricate.

Drilling—Smaller holes, higher speeds, lighter feeds. Use twist drills; center-punch the hole location; clamp the work or hold it in a vise.

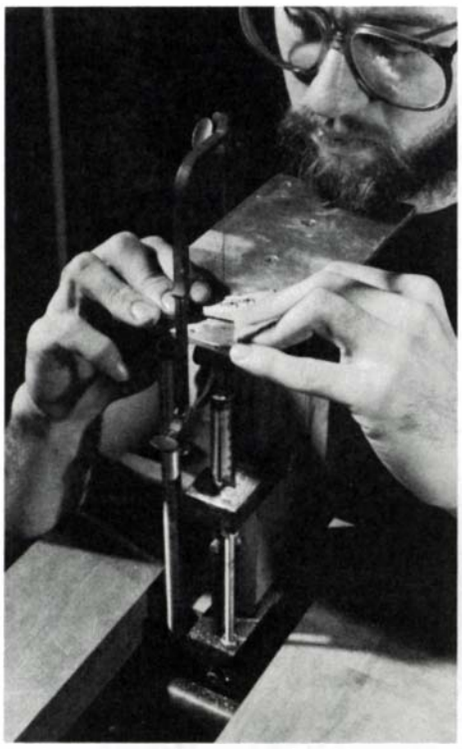
—*Steel*: low speeds; heavy feed; lubricate with oil. For easy cutting and accurate hole size, drill with a succession of drills of increasing diameter; for example, for a ¼-in. hole, drill first with a 3/32-in. drill, then a 3/16-in., then a ¼-in.

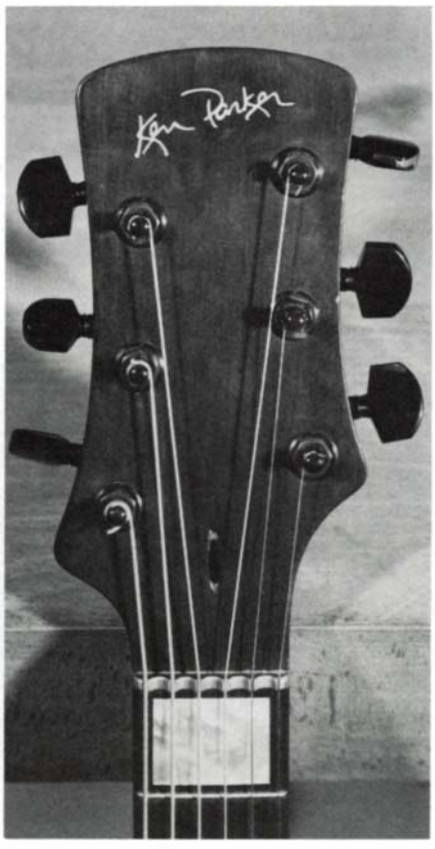
—*Aluminum*: Fairly high speeds; light feed; lubricate with light oil or kerosene.

—*Brass*: Medium speeds; medium feed; do not lubricate. Best results come from honing the rake angle to 0°, thus preventing the drill from grabbing or screwing into the work.

To mount the saw-frame in the ⅝-in. cold-rolled steel shaft,

Drawing: Ric Lopez





Parker's design allows a comfortable working posture, sensitive control of the stroke and a good view of the work. Thin, narrow sawtable, left, allows work to be held down securely between fingers and thumbs. Center, Parker cuts the mortise for his mother-of-pearl signature (0.030 in. wide) using a Foredom mounted in a simple, adjustable-leg tripod.

first remove the saw-frame handle and determine the diameter and depth of the hole that will accommodate the tang. If in doubt, drill oversize because the tang will be fixed with epoxy, which will fill any voids. Cross-drill the shaft for the stop pin that will slide in the brass track on the upright's back edge. The stop pin may be retained by a setscrew epoxied in place or, if a bolt is used, locked in place with nuts. Notch the bottom end of the steel shaft using a hacksaw, and file the notch to fit a brass or aluminum plate. The plate, bolted in place, serves to transmit the drive and spring-return forces to the shaft.

Now make the brass track, which keeps the shaft from rotating, limits travel and houses rubber pads for absorbing shock at the ends of travel. You can mill the track from solid stock or construct it from strips. Alternately, you can rout the slot in the edge of the upright, although a separate brass plate allows you to set up the saw with a blade and determine where the stops should be. Travel will be the slot length minus the stop-pin diameter and the thickness of the rubber pads. Travel on my saw is just under 3 in., the length of toothed area on a 5-in. jeweler's sawblade.

I made my table out of 3/16-in. aluminum plate. You can vary the size to suit the work; a thin, narrow table is good for cutting inlay because you can fit your thumbs and fingers around to pinch the work to the table (photo, above left), decreasing the likelihood that it will lift and break on the return stroke. Drill holes in the table for mounting, for passing the blade through (this should be as small as possible) and for attaching the spring. Also drill a couple of holes or cut a bird's mouth to be used for filing at the end of the table opposite the blade.

Assembly—Hold the saw sideways during assembly. Mark positions for the bearing blocks, and clamp them to the upright, shimming the throat of the blocks out with thin cardboard so that as the bearings wear they can be angled to take up slop. Get the shaft to move smoothly and drill through the upright for the mounting bolts. Insert bolts, washers and nuts; tighten and make sure the shaft is still free. Drill the 1/8-in. hole through the upper bearing, pin it in place and remove the cardboard shims. Slide the threaded spacer rod, with washers and nuts, through the bearings, and lock it in place in the upper bearing. Adjust the lower nuts to bring the lower bearing into line, confirmed by easy movement of the shaft. Position the brass track on the edge of the upright and test the stroke to be sure the top teeth can be brought into the work. The track may be screwed, pinned or epoxied in place. Insert the stop pin in the shaft, and see that the shaft runs freely without rotation.

To mount the saw-frame in proper alignment on the shaft, install a blade on center in the saw-frame clamps, fill the hole in the top of the shaft with epoxy and slip the saw-frame tang in. Slide the shaft up and down and observe the blade travel using a try square on the table. Align the saw-frame accordingly and hold or support it in place while the epoxy hardens. If you need to reset the tang, heat the shaft end with a torch; most epoxies give up before 300°F.

Position the table so the blade passes through and mark and drill for shankless wood screws in the end grain of the upright. Screw the table into place, making sure it is perfectly square with the blade.

Bolt the connecting plate in place at the bottom of the shaft and attach the spring from it to the table. The cord from the pedal also attaches to the plate. With the heel of the pedal screwed to the floor and the upright clamped in your bench end-vise, you're ready to saw. □

Ken Parker makes arch-top guitars in New York City.

Armand LaMontagne

Sculpting wood as if it were clay

by Roger Schroeder

Armand LaMontagne is a wood sculptor; he's also a portrait painter, cabinetmaker, architect and house builder. The North Scituate, R.I., home he lives and works in he built himself of native stone and pine wainscot and shingled it with hand-split sassafras. The hearth and chimney of this house, which he describes as his largest sculpture, is made from tons of dressed granite taken from old foundations, building sites and a nearby quarry.

The son of a master carpenter, LaMontagne holds that woodworking and art schools are unchallenging and too theoretical. He himself did not finish college. When he reads books, it's Hemingway and Tom Wolfe. When he listens to music, it's classical. When he paints, it's of the outdoors and the people who work there. He works with intensity and often puts in long hours. He's fast enough to carve a life-size human figure in a week or less. He is soundly opinionated, critical of others' work, and highly critical of his own. He makes pronouncements about wood and tools and makes them sound like gospel.

LaMontagne's instincts ultimately decide how his sculptures will look, as he has reached a level where he carves for interpretation and feeling, even if it means departing from precedent. When asked in 1973 to do a crucifix for a church in North Scituate, he determined that the carpenter-turned-preacher was strong and masculine, unlike the gentle Christ of Renaissance art. And thus the over-six-foot-tall sugar pine Jesus appears sinewy and hard.

LaMontagne's shop reveals the man. Wide planks of white pine make up the floor, a stone fireplace receives wood removed from his sculptures and the whitewashed walls are lined with old tools he collects and uses. His carving bench is thick-legged and solid.

LaMontagne compares his work to running a race that has no finish line, for he is constantly searching for new techniques that not only will speed up his work but also will "get the look," for which he has no explicit formula. For example, he does not practice staining on a scrap piece but goes right to a sculpture using oil-based dyes. This eliminates a step, he says, and cuts down on his working time. The ultimate test of a carver, he claims, is to "trust your eye. If it looks right, it is right." But even then, he adds ironically, "If you like what you've done a year from now, you've gone nowhere." His philosophy of carving, then, makes speed essential. Most carvers are slow and meticulous, whereas he says, "If you're not trying to get fast, you won't get fast. You've consciously got to try to get faster."

One of LaMontagne's basic rules is that "the tool must be as sharp and as well designed as possible for a particular job. A dull tool is the wrong tool." It is not surprising, then, that LaMontagne has designed and improvised many of his own carving tools. And yet he will use a chain saw to rough out a large sculpture, a 3-in. power-driven auger bit to hollow out a bust and a disc floor sander to put in muscle and detail on large sculptures.

In 1976, LaMontagne was commissioned by the Woodcraft Supply Corporation of Woburn, Mass., to carve its logo, an American Indian kneeling down to point the end of his spear with a knife. LaMontagne was immediately critical of the design. "No self-respecting craftsman sharpens with a knife on the ground. Put him on a stump," he said. He took the job because he saw the sculpture as a challenge, a pose with minimal contact between body and base, and involving large areas of end grain.

The sculpture started as a 48-in. diameter white pine log squared off to a block 30 in. by 34 in. and approximately 60 in. high. It weighed 700 lb. The sculpting began several days after the log was cut. Beginning from life-size drawings of a live model, LaMontagne began roughing out the figure. There were no sketches on the block. His only tool at the beginning was his 14-in. chain saw with a chipper blade, which he described as "big enough, small enough, light enough." He opened up the spaces between the legs and around the arms. What was left after only a day and a half was a human form with squarish features. Nothing at that point was more important than speed. Early in the sculpting he had to drill a hole through the left hand so that the spear would pass through it and touch the stump exactly where the knife in the other hand would be sharpening it—a critical location he determined by eye.

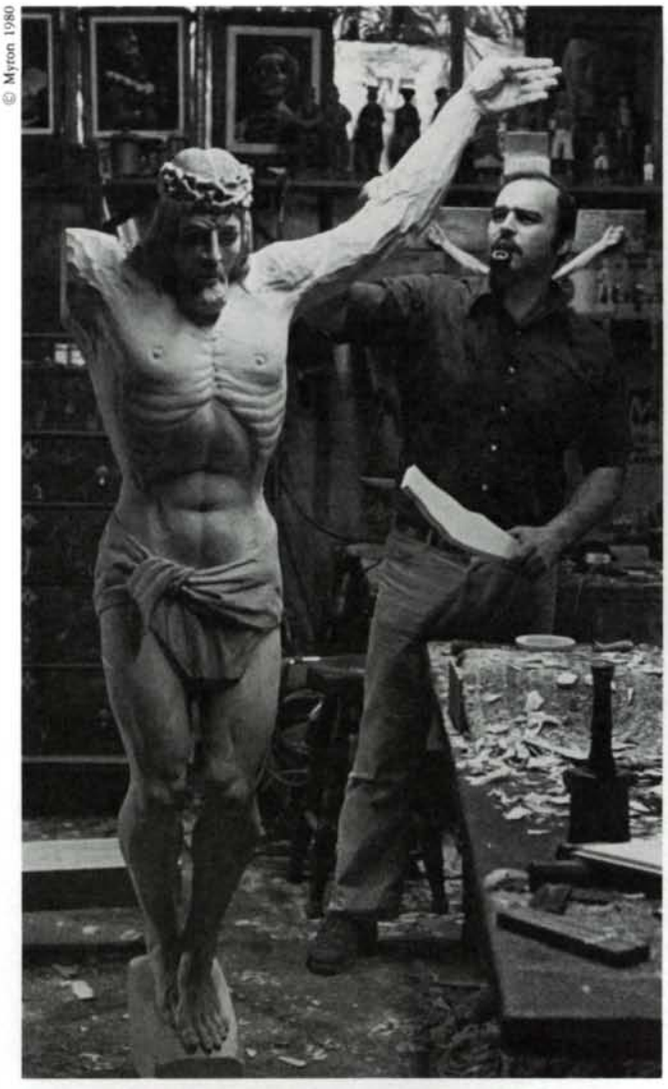
By this time the sculpture was down to about 200 lb., light enough for LaMontagne to lift onto a bench. At this point, he hollowed the stump to reduce the likelihood of checking and to lighten its weight, and he reduced its diameter. Details such as moccasins and braids were established using traditional carving tools, while the overall anatomy was carved proportionally without overworking the face or hands.

Still unseasoned, the piece was ready to be dried. Put into a propane-heated, steel chamber, it was kept at 300° F for seven days, during which time it lost 40% of its weight.

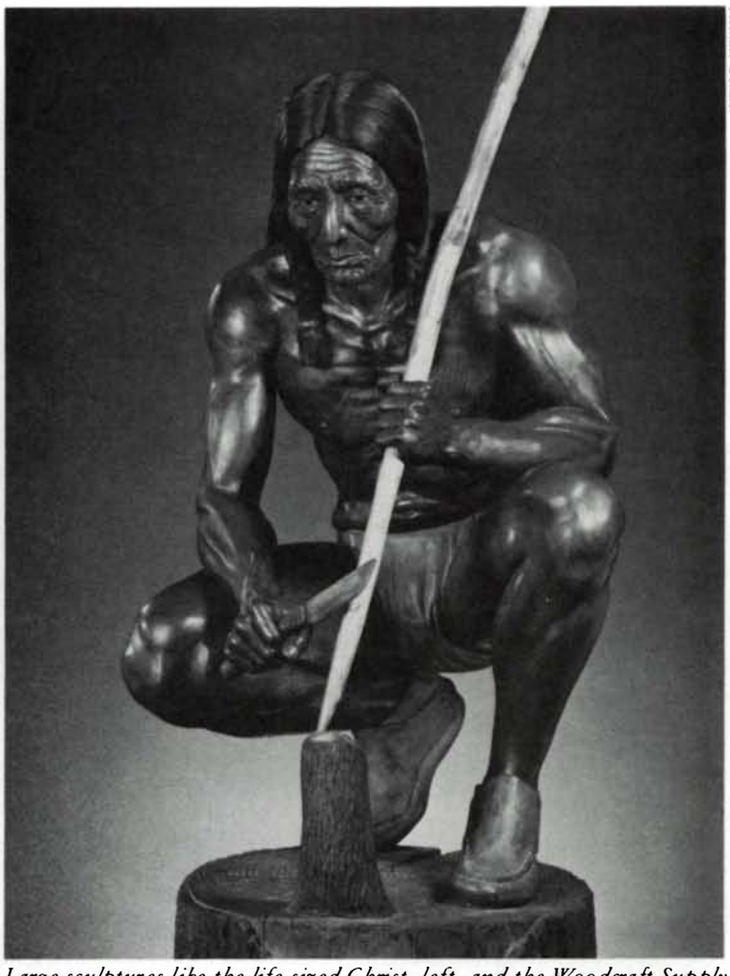
By now LaMontagne felt the basic challenge was at an end. What was left was to put in the fine details—fingernails, pores, wrinkles, and the bark on the stump. An oil-based dye of Mars red and burnt sienna was used for the flesh. He then applied a flat varnish, rubbing the areas he wanted to shine. Reflecting on the piece, which was finished in about two weeks, he is pleased with it, noting that the center of gravity is in fact in the middle of the work. He describes it as a sculpture of perfect balance.

Not all his sculptures are large. One of his most notable works is a life-size bust of Abraham Lincoln made for Jerald Beverland of Oldsmar, Fla. Working from original life masks and available photos, LaMontagne started with a block of white pine. Center cut, the heartwood in the middle, it measured 14 in. deep, 18 in. high and 16 in. wide. He began

Photos, except where noted: Joseph Avarista

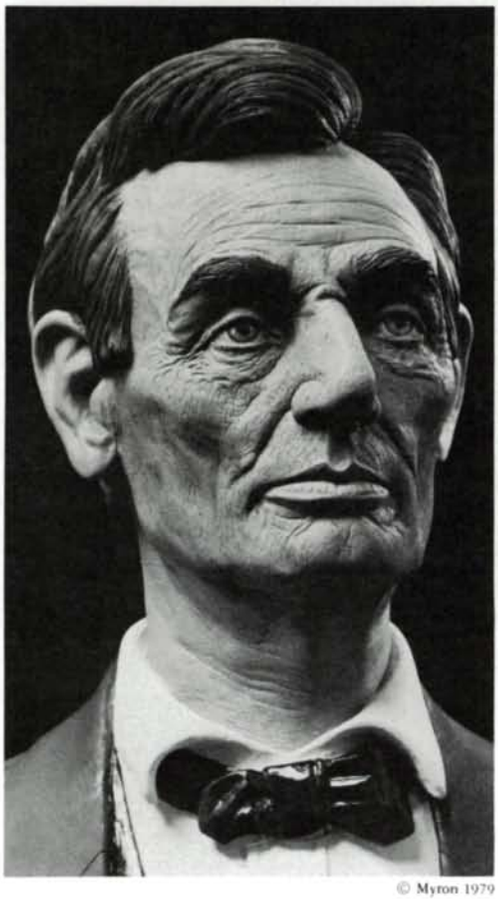


© Myron 1980



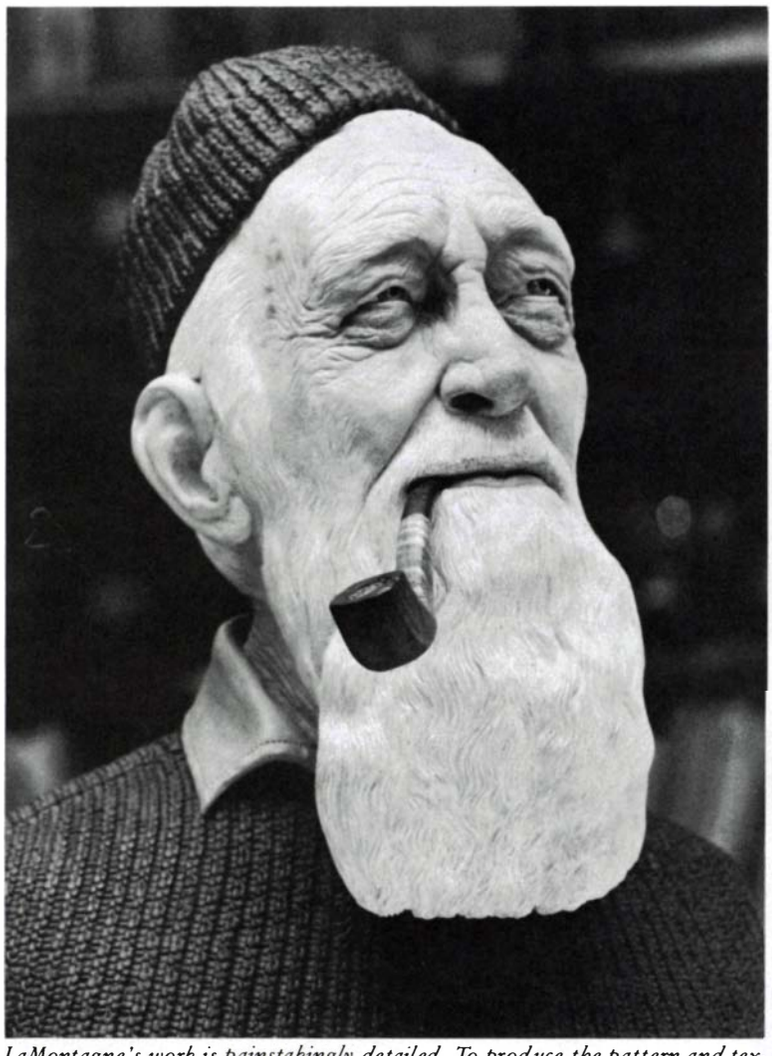
Michael Germer

Large sculptures like the life-sized Christ, left, and the Woodcraft Supply Indian, above, both of pine, are first roughed out with a chainsaw, then refined with conventional and improvised carving tools. Critical junctures, such as the angle at which the pointed stick passes through the Indian's hand to meet the stump, are located early in the carving, and by eye.

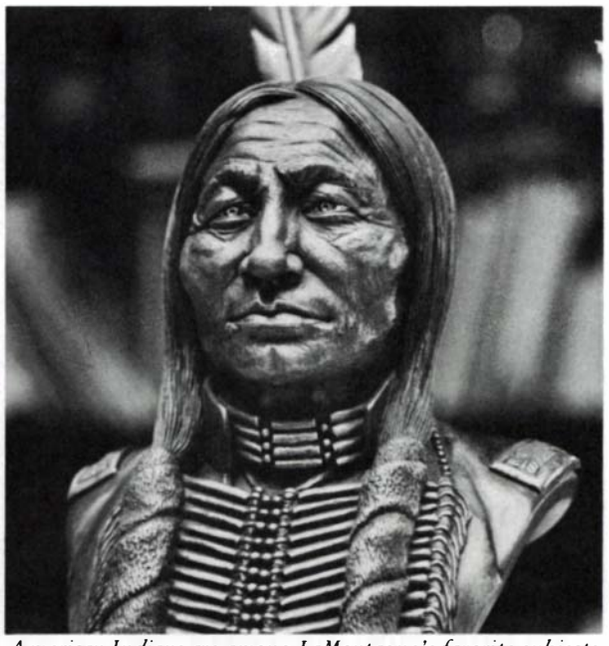


© Myron 1979

Working from life masks and photos, LaMontagne carved this bust of Lincoln (left) from a green, center-cut section of white pine. When partially complete, the bust was hollowed out, then dried in an oven. With the resulting checks filled and patched, the carving was completed. Above, after six hours of chainsawing and rough carving, the shaggy shape of a comic figure begins to emerge from a log. LaMontagne used to carve many such caricatures.



LaMontagne's work is painstakingly detailed. To produce the pattern and texture in the cap and sweater on this figure of Commodore Batton, a local resident (above and right), LaMontagne made a die stamp from ebony and pounded the impressions into the pine.



American Indians are among LaMontagne's favorite subjects. The bust above is of the Sioux chief, Crow King.

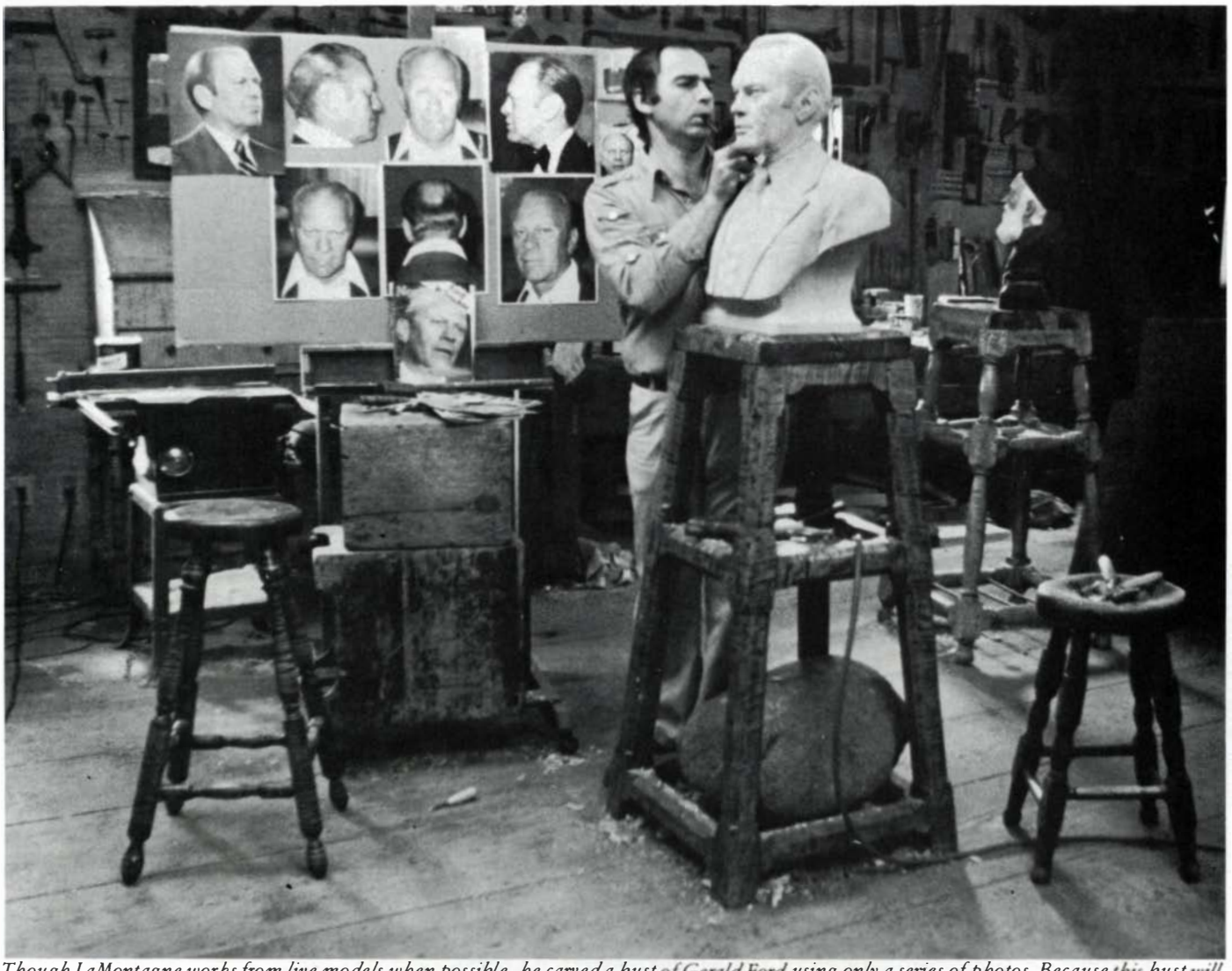
carving no more than a week after the block was taken from the tree. To work the wood green and keep it wet, he kept wet towels on it with a plastic bag over the block when it was not being carved. For combating the checking of a large, solid block of green wood, he used a 3-in. auger bit in a power drill and bored from the bottom of the bust up through the neck to within 2 in. of the top of the head. Next he bored a series of 3-in. holes in the lower torso to remove as much wood as possible, then enlarged the hole in the head with a long-handled, bent gouge. When the hollowing was completed, 1½ in. to 2 in. of wood was left on the bust. He dried it in a kitchen oven at 300° F for nearly a day, until it reached almost zero moisture content. Because it was a center cut, it shrank evenly, without distorting any anatomical features.

Some checking did occur, but LaMontagne was prepared for this. He had fashioned wooden wedges to fill both longitudinal and horizontal checks. He glued these into the checks. As the wood absorbed moisture, which it did the moment it was removed from the oven, the swelling tightened the joints. In fact, the hollowed sculpture started checking on the inside, indicating that his procedure had been a success. Having once reached almost zero moisture content, the bust would never again get so dry that it would check on the outside. It was then ready for the final carving.

Why does LaMontagne go to the trouble of hollowing his pine busts instead of using laminated blocks as most other carvers do? Aside from the economics (he doesn't like the commercial price of white pine), the natural grain of the wood plays an important role. Using a center cut of solid pine, the grain has symmetry and balance, emphasizing what he calls the grain of a person's face. "Wood grain," he says, "emphasizes the composition and anatomy. That's what you can't get with laminated wood." And it is that center-cut piece of wood that gives balance and symmetry to a bare chest or face. There are precedents for hollowing sculptures—the backs of European religious statues, set against walls or into niches, were sometimes scooped out to reduce checking. But LaMontagne knows of no other carvers who are using his technique today.

Few carvers are as conscious of detail as LaMontagne, who overlooks neither pore nor wrinkle. On the Lincoln bust, the nose is crooked as was the President's, one eye is lower than the other as was the President's, and even the hair seems to show each individual strand. The most remarkable aspect of his sculptures is the eyes. They are not glass inserts but painted wood, finished with 20 coats of high-gloss polyurethane to create a liquid look.

LaMontagne strives for stark realism in his sculptures, and American Indians are among his favorite subjects. The texture of the face of an aging Indian chief lends itself well to his



Though LaMontagne works from live models when possible, he carved a bust of Gerald Ford using only a series of photos. Because this bust will serve as a pattern for a bronze casting, he laminated the blank from basswood, as its fine grain will not telegraph onto the metal surfaces.

techniques. He has carved Crow King, Sitting Bull, Geronimo, Chief Joseph, Wolf Robe and others. Conscious of their personalities, he makes every effort to capture their aloofness, dignity and wisdom.

Not all his carving is done in hollowed white pine. In 1978 he was commissioned to sculpt a life-size bust of Gerald Ford for the Ford Library in Michigan. A bronze would be cast from it, and the painted original would also be displayed. For this LaMontagne chose laminated basswood, which he ranks second to white pine as a carving wood. Basswood was chosen to eliminate the imprint of grain on bronze that pine would make. The joints of laminated wood, he says, can be obscured with oil paint. He worked from photos and measurements and, as with his other works, he thought no feature too small or unimportant.

LaMontagne is a traditionalist who uses non-traditional methods. Dissatisfied with book-taught sharpening methods, he scoffs at sharpening stones and oil. "No stone can maintain a flat surface," he says, and oil makes a mess. He grinds his gouges on an aluminum-oxide wheel, rocking them lightly from side to side to get a small burr on the concave surface. He then goes to 220-grit sandpaper, laid over a flat surface, stroking the bevels across the paper until they are smooth. After this, he brings them to his buffing wheels. Holding the tools vertically with the steel down, he buffs them on one wheel with grey compound and then on one with red compound, removing the burrs on the concave surfaces. Of sharpening machines and belts, he says, "By the time you're set up, I'm done."

Most of his carving tools are Swiss made. Of carving tools in general he says: "There's not a chisel made big enough for me, there's not a chisel made small enough for me." Many of the tools he has designed himself are ingeniously simple. To set in the knitted pattern of the sweater on the bust of Commodore Batton, a local resident, he made an ebony punch to stamp an impression into the wood.

You don't go to LaMontagne for praise. Ultimately, he will advise, "Go home, carve. Make your mistakes. When you make a pile of chips four feet high, you will either be discouraged or you will know more about carving than you do right now. You don't need me as a crutch."

LaMontagne's own carving, which he began when he was a boy, was advanced by the work done for his carpenter father, by his early painting, and by the work in marble he did as a student in Italy. His background in painting he feels is essential to his sculpting, for he claims: "If you can do portraits, you can do anything." □

Roger Schroeder, of Amityville, N.Y., is a frequent contributor to this magazine.

Shaker Blanket Chest

A new book of measured drawings

by John Kassay

EDITOR'S NOTE: The best examples of Shaker furniture "were not the studied approach to design or a conscious effort to create masterpieces, but were rather expressions of utility, simplicity and perfection attributable to spiritual inspiration, moral responsiveness, dedication to a craft, and skill." This is how John Kassay, professor of industrial design at San Francisco State College, views the genius of Shaker designs. The following article is excerpted from Kassay's *Book of Shaker Furniture* (University of Massachusetts Press, Box 429, Amherst, Mass. 01004, 1980; $35). There are several other available books about Shaker furniture, most notably John Shea's *The American Shakers and Their Furniture*, Thomas Moser's *How to Build Shaker Furniture*, Robert Meader's *Illustrated Guide to Shaker Furniture* and Ejner Handberg's three-volume work, *Shop Drawings of Shaker Furniture and Woodenware*. With its concise introduction, its uncluttered format, superb illustrations and summary descriptions, Kassay's book is not intended for the scholar who's interested in social and religious history. Rather, the book is aimed squarely at the serious woodworker, who can scale his own shop plans directly from Kassay's drawings and purchase and dimension his stock from the accompanying bills of materials.

Inscribed in burnt letters on the back of this one-drawer blanket chest of pine in original red paint is "April, 1837 Canaan." The chest is attributed to Brother Gilbert Avery (1775-1853), a member of the Upper Canaan family, which was a part of the New Lebanon [N.Y.] community. A plinth with dovetailed corners and convex cutouts raises the chest off the floor. Four corner blocks fastened to the inside corners lend added support. The sides and ends of the chest are held together with dovetails. A lidded till with a drawer beneath is at the inside left end. As an afterthought, a hole had to be cut in the chest bottom to allow air trapped behind the drawer to escape into the chest proper. The applied tongue-and-groove molding at the ends of the hinged top is typical of Shaker work. The key escutcheons are of bone. Collection of Mrs. Edward Deming Andrews. □

	No.	Name	Material	T	W	L
A	1	front	pine	1	13⅞	40
B	2	sides	pine	1	23⅜	18
C	1	back	pine	¾	23⅜	40
D	1	chest bottom	pine	¾	16½	38⅝
E	1	bottom	pine	⅞	16¼	38⅝
F	1	drawer shelf	pine	7/16	6 1/16	16⅞
G	1	till bottom	pine	7/16	5⅝	16⅞
H	1	till front	pine	7/16	4¾	16⅞
I	2	till lid supports	pine	¼	⅜	5⅝
J	1	till lid	pine	7/16	6¼	16 3/16
K	2	front filler pieces	pine	7/16	1	9½
L	2	front and back plinths	pine	⅝	4⅛	41¼
M	2	end plinths	pine	⅝	4⅛	19¼
N	4	corner support blocks	pine	2	2	3⅛
O	4	glue blocks	pine	1¼	1¼	2½
P	2	drawer runners	pine	¼	⅞	16¼
Q	1	top	pine	1 5/16	18⅜	40⅛
R	2	end cleats	pine	1	1 5/16	18⅜

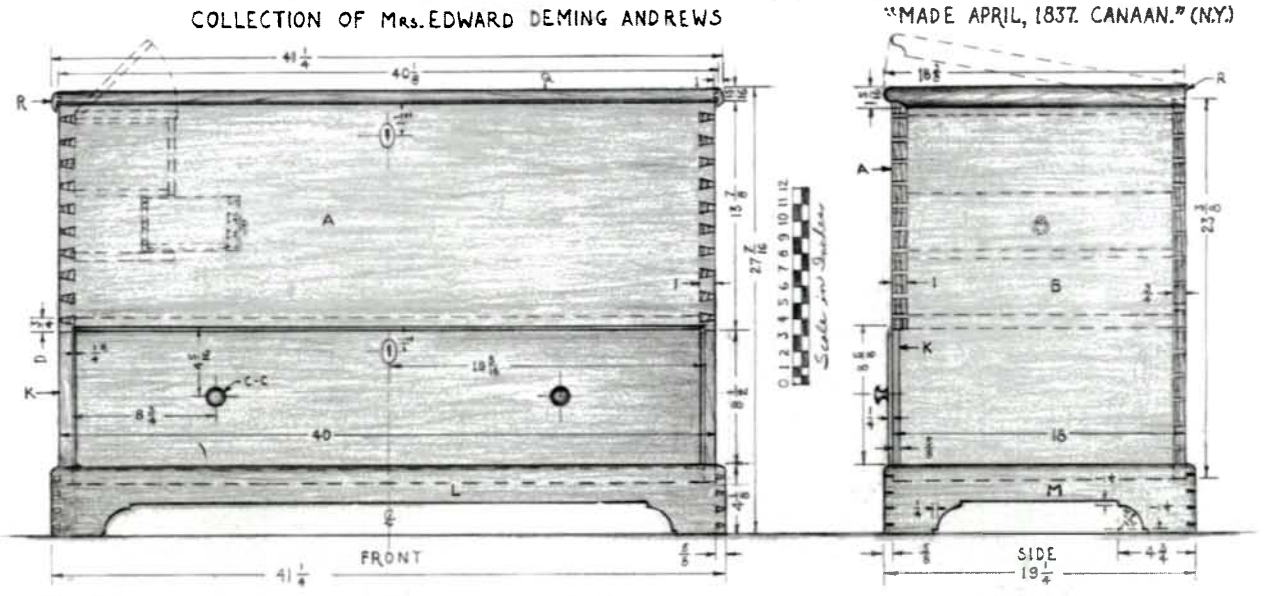
	No.	Name	Material	T	W	L
Till Drawer						
S	1	front	cherry	11/16	3½	15 11/16
T	2	sides	pine	5/16	3 7/16	5 13/16
U	1	back	pine	5/16	2 15/16	15⅝
V	1	bottom	pine	5/16	5½	15¼
W	2	fillers	pine	¼	⅜	3 9/16
X	2	guides	pine	¼	⅜	5 11/16
Drawer						
Y	1	front	pine	⅞	8⅝	38⅝
Z	2	sides	pine	9/16	8 5/16	17⅛
A-A	1	back	pine	9/16	7⅝	37⅞
B-B	1	bottom	pine	½	16⅞	37
C-C	2	pulls	maple	1 3/16 dia.		1¾
Hardware						
	1	drawer ring pull	brass	⅝ dia. ring		
	2	butt hinges	brass	—	⅜	1¾
	2	butt hinges	steel	—	¾	2
	1	chest lock	—	—	—	—
	2	key escutcheon	ivory	⅛ —	⅞	1¼

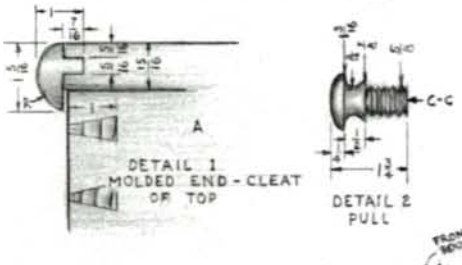
PINE
PAINTED RED

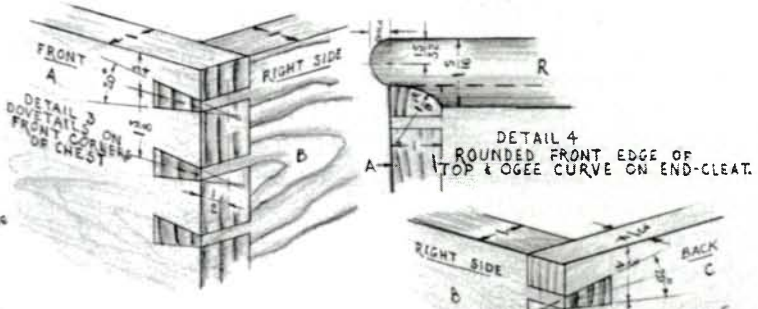
BLANKET CHEST

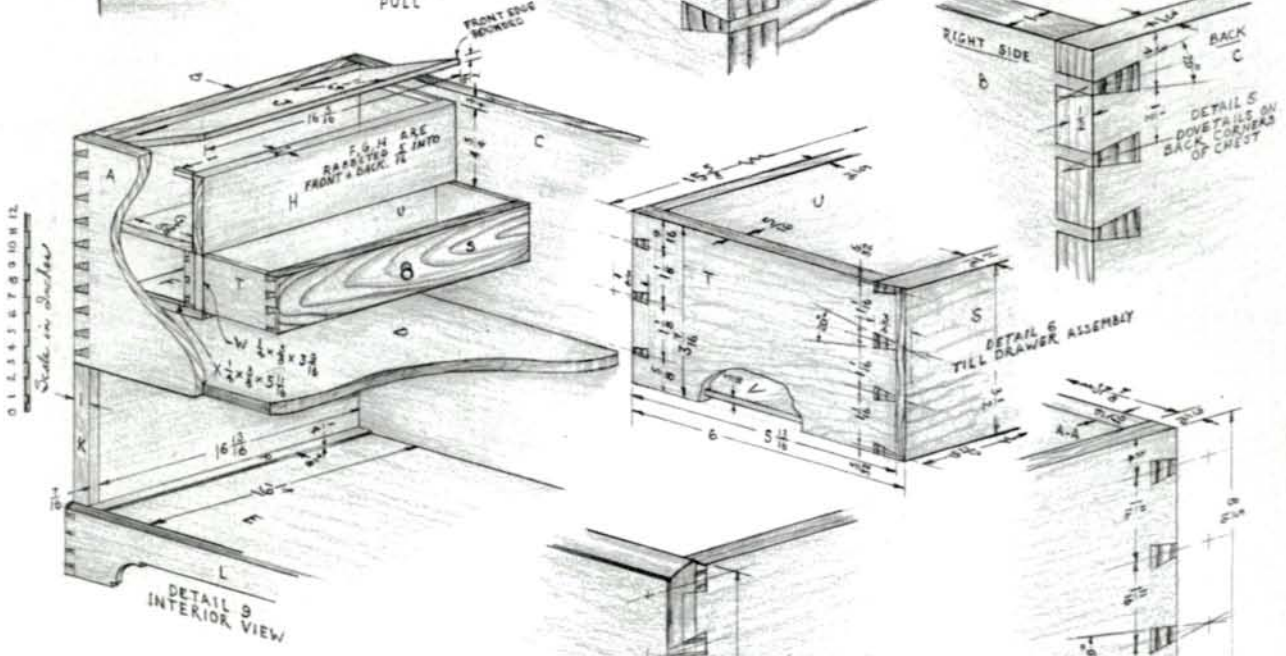
COLLECTION OF MRS. EDWARD DEMING ANDREWS

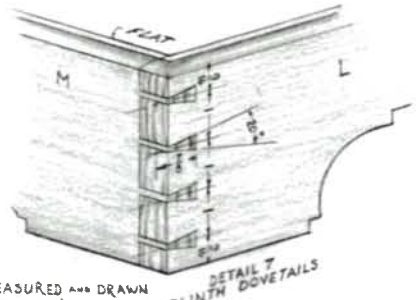
ATTRIBUTED TO,
BRO. GILBERT AVERY
INSCRIBED, (ON BACK)
"MADE APRIL, 1837. CANAAN." (N.Y.)



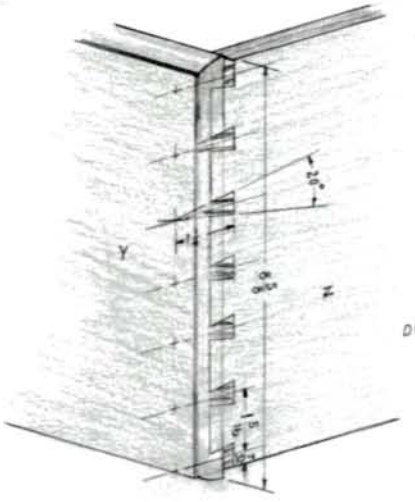


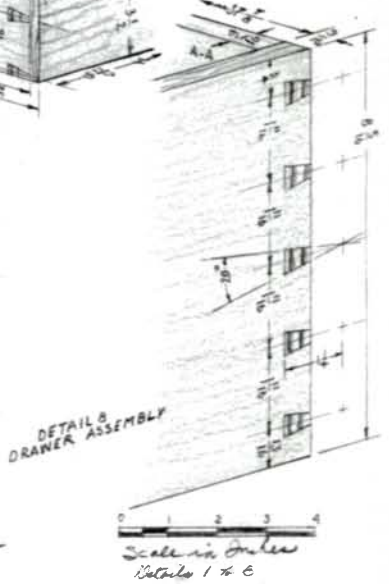






MEASURED AND DRAWN BY
Dale Kenney





Spline-Mitered Joinery

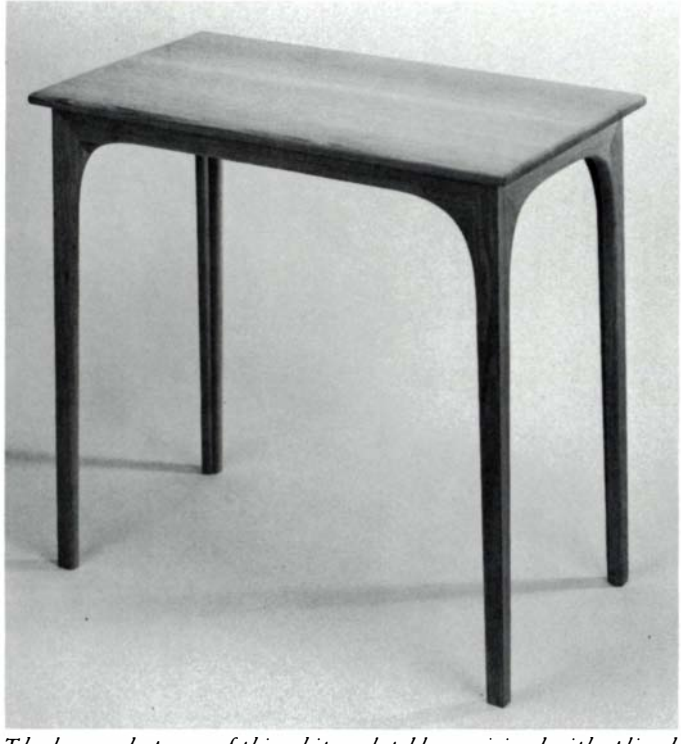
Concealed strength for fine lines

by Eric Hoag

Some years ago I solved a few design and construction problems with leg-and-apron structures using splined miters. Since then I've applied the technique to a number of projects, and after seeing these pieces exposed for several years to New England's fluctuating humidity, I believe the principles involved are sound. I was looking for a structure that would not be affected, visually or mechanically, by wood movement resulting from end grain butting long grain in the typical leg-and-apron joint. I also wanted to produce an unbroken, sweeping line from the bottom of one leg, up and across the apron, and down the other leg. Finally, I had to have strength in the joinery that would not be obtrusive or detract from the delicate appearance I was after.

The technique I worked out calls for mitering the leg-and-apron joint, which is reinforced with a blind spline, and also for joining the two halves of the legs with a splined miter (or bevel). The procedure I'll describe is for making a table like the one shown below, but you can modify it to build chairs, cabinet bases and other structurally similar pieces.

To establish the curves of the legs and aprons and to proportion the widths and thicknesses of these members, I start with an elevation drawing, fitting the end or side view within a square or rectangle of predetermined dimensions. Since the eight identical leg halves in the table must be uniformly cut, I make a Masonite pattern for these (photo A, facing page). Though adjacent aprons may be different lengths, I make only one pattern, which I lengthen or shorten in the middle (where the line is straight) as required. In proportioning the longer apron, pay close attention to its depth lest it produce, when shortened, a clunky, heavy-looking shorter apron.



The legs and aprons of this white oak table are joined with splined miters. The delicate appearance of the piece belies the inherent strength of its joints. An additional advantage is that the whole assembly can be glued up with a minimal use of clamps.

Once the patterns are made, I joint and thickness-plane enough material for the four aprons and eight leg halves before tracing the layout lines onto them. Be sure when tracing that the straight edges of the patterns are flush with the jointed edges of the stock. Then bandsaw the inner curved and straight edges of the separate pieces.

Next, cut the miters for the leg-and-apron joints using an accurately set miter gauge in your table saw. The aprons must be mitered to finished length at this point (opposites must be identical), but the legs are left long at the bottom and cut to final length after assembly. Now the bandsawn edges are given a final rough shaping and smoothing to eliminate the need for too much of this kind of work when the pieces are assembled and more unwieldy. Some of the sweat can be taken out of shaping the legs by trimming the straight tapered edges on the table saw using a taper jig and stopping just shy of the curve.

Before cutting the spline slots for the leg-and-apron joints, I study the grain and color of all the pieces and decide which leg halves will go together and which aprons will go with which legs, and I determine the face side of each piece. Then I mark them all accordingly. Once I have this information marked on each piece, I cut the spline slots using a router table and straight-face bit of the appropriate diameter—usually one-third the thickness of the stock. The advantage of the router table is that you can adjust the depth of cut without disturbing the fence setting. This allows you to make a series of progressively deeper cuts when routing these slots—a safer and more accurate way to get good results than cutting to full depth all at once.

I set the fence on the router table to precisely half the thickness of the stock, measuring from the center of the cutter. Also, I project the centerline of the cutter onto the fence, using a square and pencil. With this line as a central reference, I mark on the fence two sets of diagonal lines that will show me where to position the stock for the initial plunge of each cut and where to stop advancing it into the cutter (photo B). The distance between these diagonals (one pair for each orientation of the stock) is determined by the length of the miter involved in the joint. Keep in mind that it's necessary to leave more space at the top of the slot (where the angle is acute) than at the bottom. If you're not careful you could cut all the way through the stock at the tip of the miter.

For spline material I often use plywood, as it allows me to rip a piece the desired length of the splines and to crosscut them to width. Because the router bit leaves the slots rounded

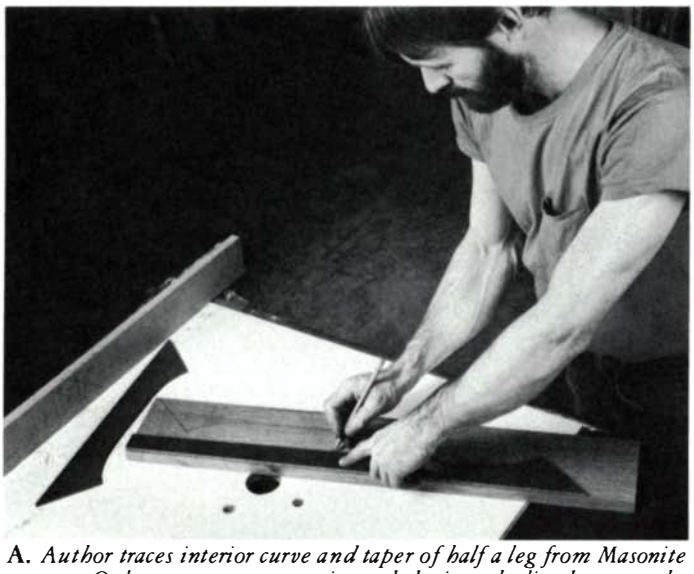
Photos: William K. Sacco

at their ends, the splines must be rounded or chamfered to fit (photo C). After dry-fitting all the joints to check for proper tightness and accuracy, I glue each leg-and-apron assembly together. If the joints fit well to begin with, the miters need not be clamped, only forced together by hand and secured with several strips of tape across the joints on both sides. Sometimes unequal stresses exerted by the tapes cause the joints to rock and cure out of square. This can be remedied by tacking three carefully positioned strips of wood on a flat surface at right angles to one another. The three members can be clamped to this U, which will keep them square while the glue sets. Remove the tape as soon as the glue dries or it may pull up bits of wood when you peel it off.

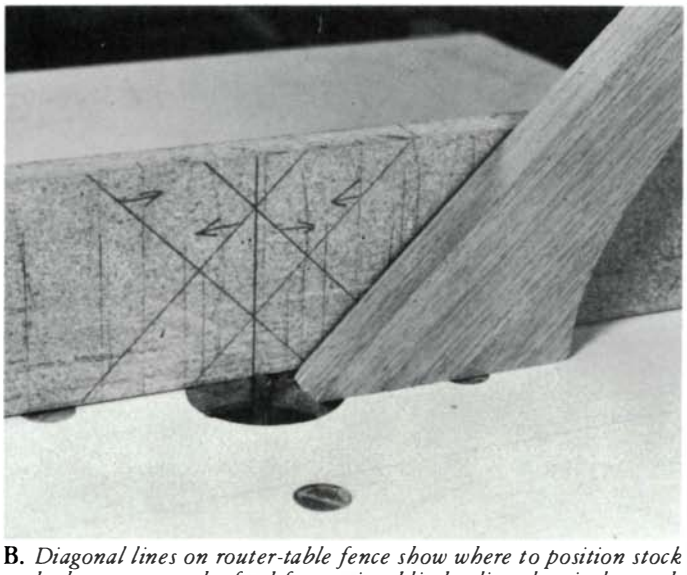
Scrape and sand the area of the joint when the glue has dried; then smooth out any irregularities in the curves where the legs and aprons meet. My preference is to round these inner edges with my router, using a quarter-round bit with a ball-bearing pilot. This rounding also helps with the final shaping, as it eliminates a goodly amount of the edge I have to file and sand to get a finished contour.

Ultimately, these four leg-and-apron assemblies will be joined together with splined miters running almost the entire length of the legs. But before proceeding further, you should provide some means of attaching the tabletop support stringers to the inside of the aprons. I use a pair of stringers, with slotted expansion holes for screws (photo D) to attach the top. These stringers have tenons that are housed in shallow mortises cut into the upper inner faces of the long aprons. It's best to rout these mortises before gluing the separate assemblies into a single unit.

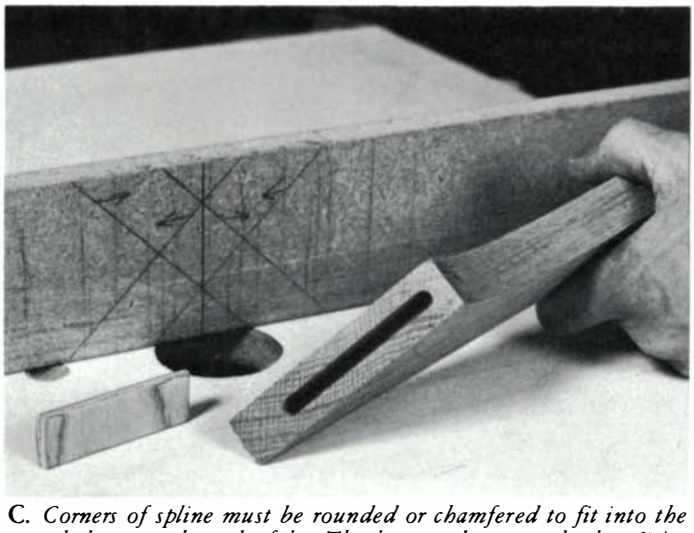
I cut the leg miters (bevels) on the table saw (photo E, next page). First I tilt the arbor to exactly 45°, checking with a combination square, and then lower the blade below the insert. Next I attach a straight wooden auxiliary fence to the saw fence, which I set on the left side of the blade, and with the saw running, I raise the blade slowly so that it just nicks the bottom outside edge of the wooden fence. The setup is checked by making a partial cut into scrap stock. The blade should enter the stock on the edge side, not the face side, and should leave behind a very narrow flat or land on the edge. This is necessary for holding the stock against the fence and keeping the beveled edge from creeping under the fence dur-



A. *Author traces interior curve and taper of half a leg from Masonite pattern. Only one apron pattern is needed, since the line between the curves can be lengthened or shortened as required. Straight side of the pattern must be registered along a jointed edge of the stock.*

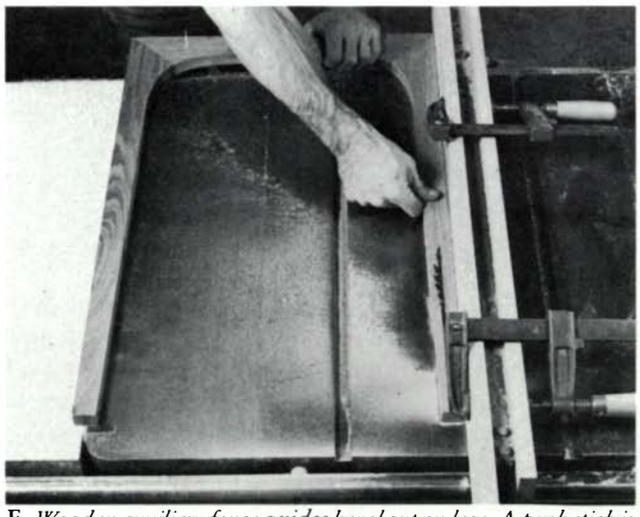


B. *Diagonal lines on router-table fence show where to position stock and where to stop the feed for cutting blind spline slots in leg-and-apron miters. There are two pairs of diagonals, one for each orientation of the stock.*



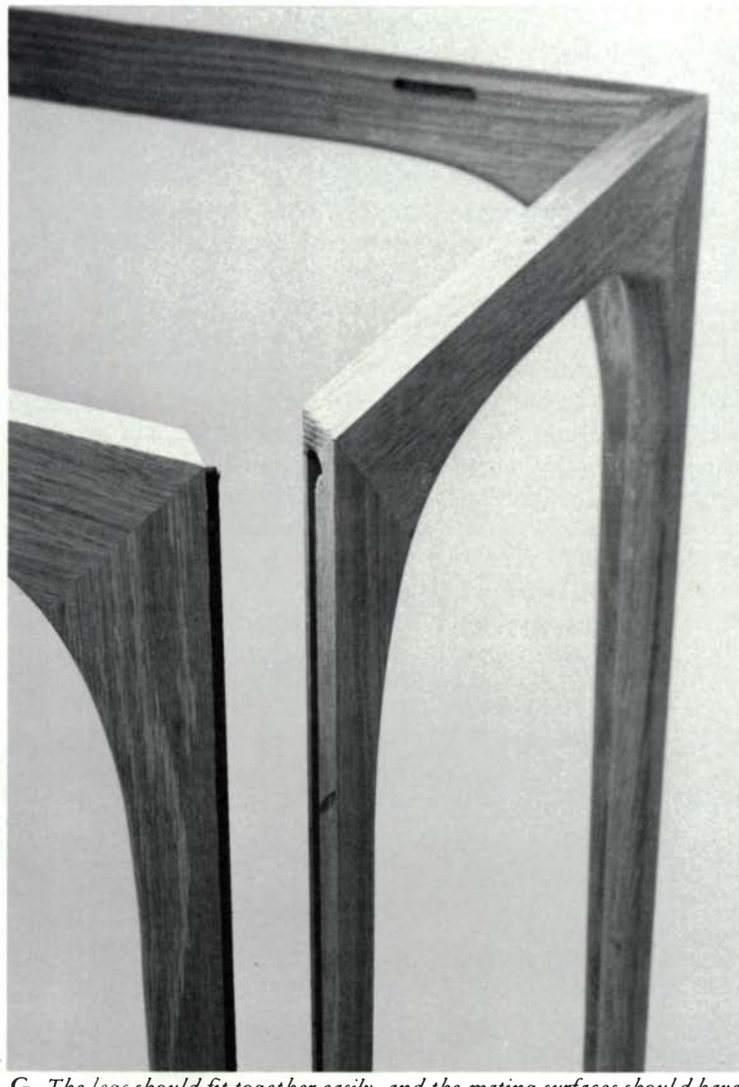
C. *Corners of spline must be rounded or chamfered to fit into the rounded areas at the ends of slot. The slot must be stopped at least ¾ in. short of the miter's toe to prevent the bit from cutting through the edge of the stock.*

D. *Tabletop support stringers are slotted for screws and mortised into the ends of the long aprons. Screw slots allow the top to expand and contract without bowing or cupping. Mortises are routed before table frame is completely assembled.*



E. *Wooden auxiliary fence guides bevel cut on legs. A push stick is used for the last several inches of the cut, and care is taken to keep stock from being burned or gouged by the blade.*

F. *A wide fence on router table is used to guide stock when slotting the miter down the length of the legs. The extra-large fence gives needed support to the leg-and-apron assembly and ensures accuracy in cutting.*



G. *The legs should fit together easily, and the mating surfaces should have no gaps for an ideal interface. When the glue is applied, the joints are assembled by hand, pressed together and secured with clamps and tape at frequent intervals along their length.*

ing the cut. When two leg halves are assembled, these lands will create a small chamfer down the outside corner of the miter. This may be eliminated by planing or filing, or you may choose to increase its width or to round it over. Use a push-stick for the final 6 in. or so of the cut and take care that the work doesn't lurch against the blade as the cut ends, as this will create a gap in the joint.

Though you can cut the grooves for the splines on the table saw, I prefer to use the router table, which I equip with a high fence, angled accurately at 45 ° (photo F). Cutting the grooves this way allows you to stop them easily, and the high fence gives good support for the stock, ensuring accuracy. I cut the splines from scrap stock planed or resawn to the proper thickness, or I cut them out of plywood. With the splines in place, I dry-fit all four assemblies together (photo G), looking for a fit that is snug, with all joining surfaces in contact. The fit should not be so tight, however, as to require force to get the whole thing together. Use a band clamp around the top and C-clamps or spring clamps on the legs, working from top to bottom to ensure proper glue squeeze-out. Then I reinforce the joints with tape, where possible.

Depending on the piece of furniture you are making, there are additional steps prior to final assembly. A chair or a stool with a drop-in seat will need a groove near the upper inside edge to accommodate the tongue of a frame to support the seat. An inset tabletop will require a rabbet along the top inside edge. Although I've never had to use stretchers with this design, an end table with a shelf may require making some joints to receive the shelf supports. Lastly, in the case of a large piece (or one that will get rough treatment), corner braces may be necessary. Where they are placed will depend on where the increased stresses are expected. I mortise them into the structure, usually across the mitered joint between the leg and apron at an angle that will conceal their presence so they don't detract from the appearance of the curve. These corner braces can be decorative as well as functional in tables with inset or overlapping glass tops.

As I said earlier, I like to cut the legs to final length after assembly, whenever this is feasible. After the glue is cured, the tape removed and the excess glue scraped away, I set the fence on the table saw to the finished length of the legs and make the cuts by running the two long aprons against the fence. Before cutting, however, I wrap some tape around the foot of the leg where the sawblade will exit. This helps keep the wood from chipping out as the blade comes through. □

Eric Hoag, 37, is a professional cabinetmaker. He lives in Branford, Conn.

Coloring With Penetrating Oils

A little dab goes a long way

by Oscar MacQuiddy

In my article on clear finishes *(FWW #26,* Jan. '81) I said little about the business of coloring wood, except insofar as a clear finish might darken certain woods, as in the case of oils. Color is a quality possessed by tiny particles of a substance. These absorb all wavelengths of light save those in certain portions of the spectrum, which are reflected and which we perceive as color. What makes a thing look green is its ability to absorb red. A stain consists of tiny particles suspended in a liquid or a paste. Because ultimately the test of a color's quality is its degree of permanency and how closely it approaches what you want it to do, I like to use readily obtainable universal colors.

These colors are standardized, and several brands are available. Also, they are inexpensive if you buy them in large quantities; I purchase them in pint containers. For class demonstrations I have pints of all the available colors, and I have never experienced any problems mixing them with any finishing product but lacquer. In my teaching I must use materials that are readily available where artist's supplies are sold, and the colors that are most easily and economically obtained are universal colors. Oil colors are slower drying than universal colors, and they don't burnish as well, probably because the particle size is larger. Universal colors are intended to be mixed with water-based finishes, including Deft Wood Armor. They can be used in varnishes and, most important, in penetrating oil finishes.

In case you think my preference uncraftsmanlike, you might be interested in a conversation I once had. I phoned one of the really fine antique furniture dealers. Saying I was an instructor of furniture finishing, I asked if I could speak with his refinisher. After asking the refinisher a couple of innocent questions to get the conversation going, I said, "Tell me, how do you handle your stains?" He told me that he used universal colors and thinned them with turpentine. Since then I have spoken with other commercial finishers and gotten more or less the same answer. The wide range of color available in universal colors provides professionals with the variety and versatility they need.

The stable earth colors we use are named after geographical areas. You may have heard of raw sienna. Sienna is a part of Italy. The earth there is an intense yellow, and it's used to make pine and maple stains. It has good transluscency although it can be too bright. Since this earth contains a lot of extraneous organic materials, Italians experimented with firing to purify it. It turned red, and became known as burnt sienna. That's the beautiful red we use on mahogany, but used alone it's too red. In another part of Italy called Umbria, the soil is greenish-brown in color, and they'd use it when they wanted to make a deep, cold walnut. When they wanted to deepen another color they put some raw umber in it. In purifying it they produced "burnt umber," a beautiful brown the natural shade of walnut. Working with these four colors—raw sienna, burnt sienna, raw umber and burnt umber—it is possible, in most instances, to match almost any color you see on wood.

Of course, you do have a wider choice of colors. The Spanish oxides are tremendously stable red colors. Sometimes French ochre, a light, more subtle shade of yellow than raw sienna, matches some of the early pines a little better. Or you can get modern chromium oxides, yellow and green. In my kit I carry the four stable earth colors and three additional yellows—a French ochre, a chromium oxide and a bulletin yellow for the places where I want to add a spot of yellow that's really alive. I carry three reds in addition to burnt sienna—American vermilion, Venetian red, and a tube of French vermilion, for the times I want a red shadow that is warm but not bright. For the greens, I have chromium oxide and permanent green, in its medium version.

In coloring wood, I prefer not to stain. I'm not knocking stains, but I teach students to see the color they want and to set out like an artist to make it. Stains simply don't give the effect I want, but they will give solid color, in particular the 5-Minute Watco stains, which come in nine wood tones and nine colors. I prefer to develop the color gradually with control, which produces subtle nuances and a high degree of transparency. Of course, compatibility with the penetrating oil finish is necessary. In choosing the so-called universal colors, nothing is compromised.

In using universal colors, I like to mix them with natural Watco Danish Oil because the color will penetrate the wood along with the oil and become tightly locked in. But sometimes I use Minwax Antique Oil (a polymerizing tung oil) as the vehicle for the colors, especially where I want a harder, glossier finish that has the appearance of being built up on the surface of the wood. One advantage of using Watco as the vehicle is that if you make a mistake, you've got 30 minutes to rub it off with a clean rag soaked in turpentine or thinner. You can remove close to 90% of it if necessary and you can start again within a few minutes. You have a marvelous leeway in developing color.

Let me emphasize that I'm not talking about dramatic color changes. You don't take ash and make it look like rosewood. This method just isn't practical for that, nor does it produce a uniform color. You use it to create shades of color where they enhance the overall piece. Let's say we have a piece of furniture that has some carving and turnings on it and we want to emphasize the designer's original concept. There will be shadows in the recesses of a carving and at the depths of a turning. Assume we have already done the preliminary finishing. Using a piece of cardboard or plastic as an

Oscar MacQuiddy, 71, lives in Southgate, Calif. This article, the second of two parts, was adapted by Alan Marks from MacQuiddy's lectures at The Cutting Edge in Los Angeles.

artist's palette, we put on it little spots of color (shadows do have color). If it's the shadow on a piece of walnut, burnt umber may approximate it. But perhaps we want a subtler shade. So we add spots of raw umber and a bit of red or yellow on the board. Pour on a tiny bit of Watco and take a ½-in. white bristle brush and capture a little puddle of the oil. Pick up some burnt umber and rub it into the oil. Say we want to go a little toward the red. Wipe off the brush in a rag, pick up a tiny bit of red with the tip and rub it into a little area of the brown spot. Now hold the spot next to the shadow. Say it looks all right, but it's not quite dark enough. Wipe off the brush and pick up a bit of raw umber. Rub it into part of the red-brown area to darken it. Now hold that next to the carving, and it looks mighty close to capturing the tone of the beautiful shadow.

Next, take a shallow catfood can and put in it a tablespoon of Watco, a teaspoon of burnt umber, a tiny bit of red and mix them, watching the tone as it develops. Get it about right and then add a tiny bit of raw umber to darken it. Now we have our shadow color. Using Watco as a vehicle to carry the color, we have produced a rather concentrated stain.

Take a small brush and go over those carvings, covering all the areas, and let it sit until it gets a little tacky. Then get a clean rag and try to remove it. You won't be able to get it all off, and the amount you leave is going to be exactly right. The whole area will accept the tone, and rubbing diligently on the convex highlight areas will expose them to advantage. Now you suddenly discover that you have added depth to this carving, making it appear as the designer once envisioned it, with prominent highlights and deep shadows. When it is thoroughly dry, give it another coat of clear oil rubbed in by hand; then wipe off the excess. This seals in the color. Waxing later will give it a translucency that will make it even more spectacular and will bring even more life to it.

Charles Kishady, my associate (a master antique restorer), suggests that when restoring fine antiques, you should use at least three colors in shadowed areas—a basic color, a lighter color and a darker color. The exciting thing is that you can warm a color with a spot of an analogous color or kill it by adding its complement. If you put on a red and you want to reduce its intensity, green will do it, making it go towards a brown. The tiniest bits of color achieve dramatic changes. You can have one color in the highlight area and introduce a trace of its complement in the shadow. This changes the quality of the shadow emphatically.

I recall refinishing a table with a lot of intricate carvings on the legs and two drawers in front. Because of the old finish, the carving was totally lost. You knew some kind of irregular surface was there, but you didn't have the foggiest notion what it was. I asked the owner, "How would you feel if that carving suddenly came to life and you could see it?" She indicated that perhaps it would be a good thing. So I took the table to my shop, put on a polyurethane varnish and rubbed it out to a durable satin finish. But first I mixed some dark, murky color and smeared it over the carved surfaces. Then I spent an hour trying to get the stuff off. Most of it I removed, but the carving had now dramatically come to life.

I once worked with a student refinishing a lovely little cherry coffee table. It had a large white slash of sapwood across the top. A purist might say, "Well, since it is natural you'd expect that white slash in cherry." But all you saw was the white slash. Now I felt it belonged there, but wanted to alter it so your eye didn't stop at it but wandered on around to see the rest of the table. I made some shadow color and put an extremely light coat of the color on the white. It didn't change it much but gave it the general tone of the darker area. Then picking two or three spots along the white slash, I introduced a little more of it, slightly darkening these areas then fading off to a very, very light color. You still noticed the white area, but your eye moved on to look at the whole table. Still, I wasn't satisfied. It had gone a little cold, so I took a tiny bit of American vermilion and burnished it into the top of that table. That changed its entire character. Suddenly the table seemed to move off the ground.

In using this approach to finishing it is important to ask certain questions. If you are considering a chair, for example, do you see merely a chair or do you see a chair with one post that is different? Does it have some quality that makes its back stand out from the rest, or do you see the chair as a whole? Is the ornamentation conspicuous? Do you see shadows? Do you see highlights? Does the carving look like part of the piece or like an unrelated appendage? On an old chair, up for restoration, does it appear as though someone has been sitting in it, has rubbed the back slightly, has rested his arms in certain places?

You can approach furniture finishing as an artist would paint a picture over which he wants your eye to move in certain ways. But you should also be concerned with the effects of use and care. If it is a chair, the places where people habitually put their hands will be a little lighter than the rest. People wonder how to intuit this sort of thing. Let's say the chair you're working on belongs to a wealthy lady. She has a housekeeper who has a lot of work to do, and so cleans well only the places she knows her mistress will notice. She'll notice the overall appearance, but where the posts join the rails her housekeeper will leave a little dirt, and where the spindles join the rungs she won't be able to reach. When you decorate furniture with these things in mind, you discover you're creating authentic-looking antiques.

I had one student who had made many trips to the East Coast and had collected some very beautiful cherry furniture. We restored all of it eventually, but when we first started she said "I don't want any of that stuff [color] on my furniture." But when she saw some finished pieces, she began to do the same with hers; and when she finally completed her work, she was convinced of the merit of shading. Her beautiful cherry tables were all shades of color. When the appraiser came to evaluate them, each was assessed at a top price. The man said he'd never before seen restoration done so well.

As I said in my first article, you don't have to remove old finishes completely when you want to preserve their original patina. After cleaning the surface with TSP, just take a small can of natural Watco, or if the wood has been stained a dark color, pick one of the darker shades of Watco, and a small pad of 4/0 steel wool. Wet the pad with Watco and rub softly with the grain. This will remove any loose finish, and the oil will penetrate into areas where finish is missing. Start by doing a small portion to find out how quickly it is going to dry and how fast you can work; then wipe this area thoroughly with a clean rag. Frequently you will find this surface now almost

AUTHOR'S NOTE: The only text I have found that treats the subject of color the way we do in our courses is H.W. Kuhn's *Refinishing Furniture*, Arco Publishers, New York, N.Y. 10003, and I recommend it highly.

completely restored. You may have a problem in several spots where color is missing. Since you already know how to recognize what this color consists of, you can match it, and then burnish the color into these spots. And now the piece is thoroughly restored.

In class after my lecture on finishing, I bring in a piece of furniture in sad shape and tell the students, "I am going to restore this piece, and in 20 minutes it will be acceptable to sell." Of course, no one believes me. I pour some Watco into a container, and with some 4/0 steel wool I quickly rub the piece down. I squeeze out some universal color on a palette and show them how to match the color. Then I pick up some more oil, rub the color into spots where it's missing, and presto, the job is 95% done. In two or three places it may be necessary to come back the next day and rub in some more, but it's essentially done at that point. Minwax Antique Oil also works well. Most antique dealers could restore furniture without altering anything, or ruining the original patina. But instead, they usually work their hands to the bone putting on varnish or something else and make a mess of things.

If you need to clean the furniture, rub it down lightly with a mixture of vinegar, turpentine and mineral oil. If the finish is thoroughly dried out, as some old varnish finishes are, you can use linseed oil instead of mineral oil. When working with oil, you must wipe off everything you put on, and you must dispose of the rags properly. To prevent a fire don't throw them in the trash, but spread them out to dry.

I would like to say a word or two here about lacquers. On woods requiring a minimum change in color or texture, water-white lacquers are satisfactory, especially when speed is important. You can put on three or four coats of lacquer in one day. But in working with lacquers, color is sometimes a problem. However, vinyl stains work very well with lacquer, though you don't have the freedom you do when using the penetrating oil finish. But using the vinyl stains and very carefully shading or highlighting before applying the lacquer produces good results.

The 5-Minute Stains made by Watco are aniline dyes dissolved in methanol, and they work very well. Watco is completely compatible with urethanes and acrylic finishes. They will go on over a Watco/universal-color mixture, and the Watco/universal-color mixture can be applied over them. Let this dry, and apply a finish coat of urethane or acrylic to lock it in. You can blend two or three colors to get special tones. Minwax provides aniline dyes in other forms, more subtle in color. In working with stains, stay within the family. If you start with Minwax, work entirely in the Minwax line. If you are using Deft, stay within the Deft family of products. You may avoid some costly errors.

One of my students had built his daughter some walnut cabinets for her kitchen and bathroom. He wanted to finish them so that moisture would be no problem. He'd worked too hard on them to have them spoiled. He said to me, "I want them to look oiled. Can we do it?" I said I could see no reason why not. He brought in some samples of his walnut and we experimented a little. We put on two coats of Watco for the oiled appearance, and we followed that with two coats of satin urethane varnish. When it had thoroughly dried, we rubbed it with steel wool and wax. It resulted in a soft, subtle oil finish, and the wood was completely washable.

I usually finish off with waxing. Of the waxes available, I prefer a hard wax finish that is easily maintained, having to be done perhaps every six months. I call my method the "three-rag approach." Take three clean rags and a can of Trewax, which is comparable to bowling-alley wax or similar to any one of the hard carnauba-wax products. Thoroughly saturate the first rag with wax. Rub that saturated rag on the surface to be treated and attempt to load it with wax, putting on as much wax as you possibly can. Set rag #1 aside and wait about one minute. Then take rag #2 and try to remove every trace of wax. Scrub, rub, get that wax off. Wait five minutes, and take rag #3 and lightly burnish the surface. This procedure may seem unduly complicated, but it works. You put the wax on, thoroughly saturating the surface. You rub it off, and you will have no difficulty burnishing to a soft, shiny, smooth surface.

Alan Braus Photo

Oscar MacQuiddy touches some tone into a shadowed area of chair's arm. He mixes earth colors with Watco oil on a cardboard palette to create just the right effect in restoring antiques.

If you have a problem surface, one not quite as smooth as you would like, particularly when you've applied polyurethane and dust particles have contaminated the finish, another approach is necessary. Take some 4/0 steel wool and after applying the wax, rub the surface with long straight strokes, removing the wax as outlined above. You will smooth the surface and get rid of the excess wax at the same time. Upon wiping the surface down, you will have achieved a beautiful satin finish with a protective wax film. All the dust particles will have disappeared, and you can count on compliments from people who see your work.

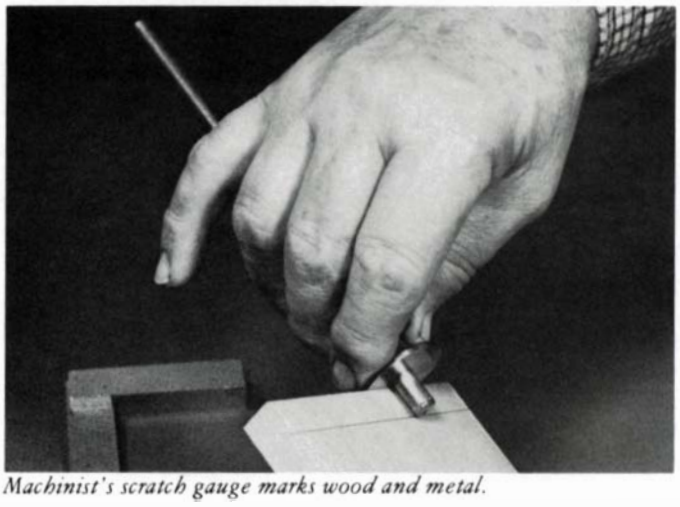
The exciting part of teaching these methods of finishing has been being able to communicate my enthusiasm to others, helping them develop an appreciation for fine work, helping them to understand that with simple materials it is possible to work miracles. You don't need to use exotic preparations. You can use things that come off the shelves of discount paint stores. You come to know how it feels to work directly with your hands and to know the effects you are capable of producing. □

Template Dovetails

Another way to skin the cat

by Charles Riordan

Tools for template dovetails.



Machinist's scratch gauge marks wood and metal.

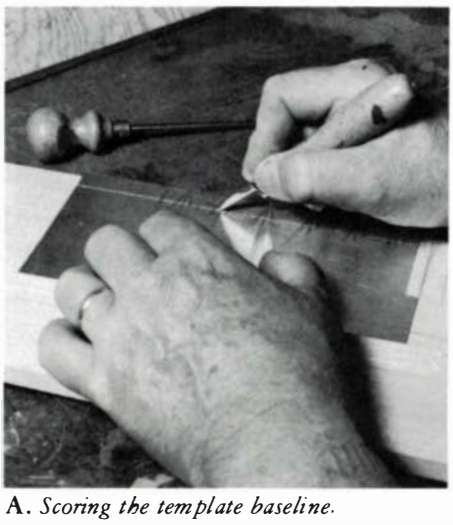
For centuries the dovetail joint has been the most satisfactory method of joining two pieces of wood meeting at the end grain. It's especially appropriate for drawer and case construction. The joint is strong, durable and decorative, one of the hallmarks of the master craftsman. However, the tyro need not approach dovetailing with a faint heart. There are indeed many ways to divest a feline of its fur; I believe using templates is the best way to produce dovetails. The method described in this article, with special attention to drawer construction, owes its inspiration to Andy Marlow, whose *Classic Furniture Projects* (New York: Stein and Day, 1977) describes a similar approach.

Templates can be made quickly and easily using the sheet aluminum stocked by almost any hardware store. The photo top right shows the tools I use. The scratch gauge, photo right, is a machinist's gauge made by Starrett Tools (Athol, Mass. 01331), and I use it for both laying out the templates and marking the boards for the dovetails. Over the years I have found this marking tool easier to use and more accurate than the conventional cabinetmaker's marking gauge.

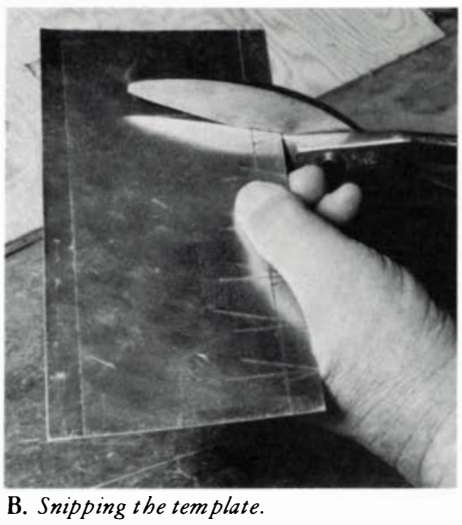
Charles Riordan makes period furniture in Dansville, N.Y. For more on his work see FWW *#26, Jan. '81, pp. 98-99.*

To make the template, cut a piece of aluminum about 4 in. wide and long enough to span the width of the stock you are joining. Make sure that the bottom is square to both sides. Don't count on the sheet you buy at the hardware store being square at each corner; check it. Set the scratch gauge to the thickness of your drawer-side stock, or the stock you will cut tails in, and mark the sides of the template. You will be able to make two templates from this one sheet, one on each long side.

Determine the number of pins necessary for the depth of the drawer and mark their centers on the template using either a rule at an angle or the dividers, starting so the bottom pin just misses the groove for the drawer bottom. I use the bottom of each board as my reference edge for marking the pieces. With the proper pin spacing marked, set the bevel to the desired angle, usually 15°, and mark the pins on the template. Leave just enough space at the points to allow the jigsaw blade to enter. Take a sharp-pointed knife and score the bases of the pins (**A**). Laying the top blade of the tin snips in the scratched lines, cut the sides of the pins slightly through the baseline (**B**). Then, with the long-nosed pliers, grasp the waste metal at the pin baseline and carefully bend it back and forth until it breaks off (**C**). A little touch-up with a fine file and your template is ready.



A. *Scoring the template baseline.*



B. *Snipping the template.*

C. *Breaking out the waste.*

Photos: Don Sylor, Trinity Galleries

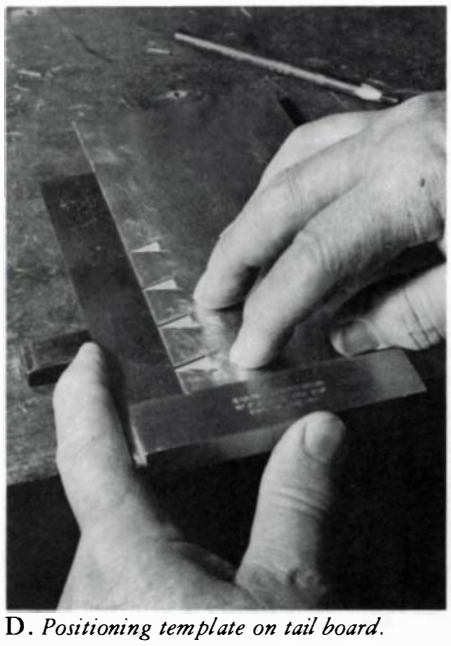
Hold the boards to be marked for the tails firmly on your bench either by clamping or with bench dogs. Leave enough space above the dog to hold the square against the bottom and end of the board, and butt the template against the square (**D**). Hold the template firmly and mark the tails (**E**). It's important here that the scratch awl be sharpened to a needle point and that it be held at the same angle for each marking, an angle that will ensure that the point follows the template cutout unerringly. Observe the grain direction and mark so that the grain will force the point of the scratch awl against the guide. The consistency of the marking will determine the accuracy of the joint.

To mark the pins, I place the board to be marked in the vise with a flat back-up board extending slightly above it. If your vise is too narrow to exert pressure across the whole width of the board, use a C-clamp or two to make sure there is no gap between the back-up board and the piece to be marked. Place the template on the end of the board to be marked and firmly against the back-up board. Abut the template against a stop held against the lower edge of the piece to be marked (**F**) and mark the pins. Here again I must stress the importance of the angle at which the scratch awl is held; a few degrees variation will result in a poorly fitting joint, especially if the errors are additive.

With a small square and the scratch awl, mark the inside face of the drawer back (or front) for the wide side of the pins. I find that it helps also to mark the narrow side of the pins on the outside face for through dovetails, especially if the wood is not fairly straight-grained. Now take a soft, black pencil that has been sharpened to a chisel point and trace lightly over the scratch marks (**G**). This will leave the center of each scratch line clearly defined as a thin, light line between the black pencil lines.

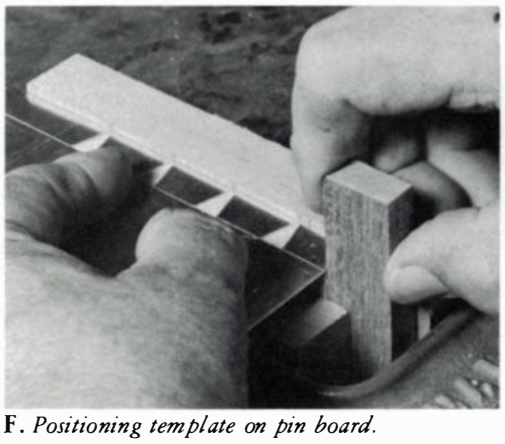
To cut the pins for a lipped (rabbeted) drawer front I use a router, with the drawer front clamped vertically in the vise (**H**). To give the router a firm base I clamp a piece of hardwood 3 in. thick, 4½ in. wide and 12 in. long to the face side of the drawer front. I also clamp a stout piece of hardwood to the inside of the drawer front both to protect the piece from clamp marks and to act as a stiffener. Instead of using the router guide fence I use a fence (or back stop) fastened to the heavy base board. I find that this gives firmer control over the router and less chance for tipping or wobble when routing end grain. This is important because the router bit is extended to include the depth of the drawer lip as well as the pins and is otherwise unstable.

Do not attempt to rout all the way to the pin lines. Come as close as you feel is safe, leaving a shaving or two to clean off later with the chisel. Of course, the depth of the pins and their width is taken care of by the depth of the router bit setting as well as by the positioning of the fence. →

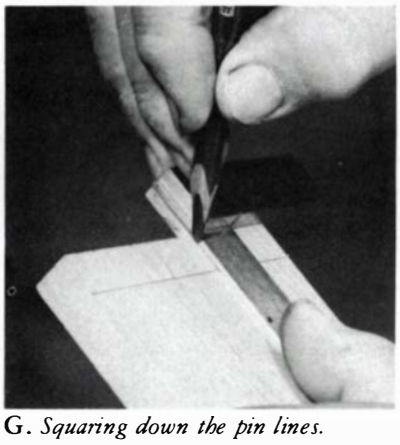


D. *Positioning template on tail board.*

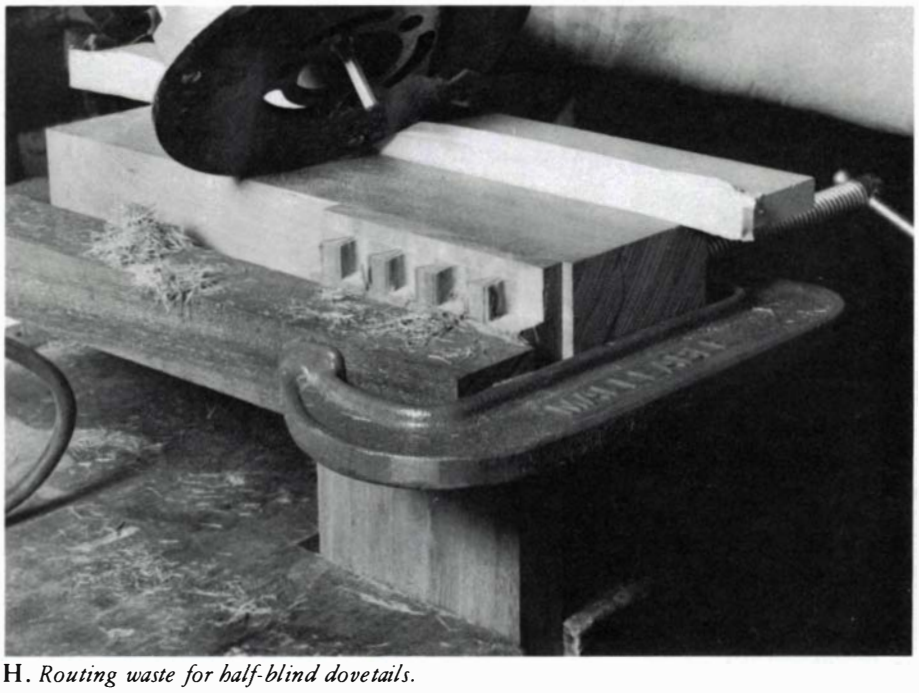
E. *Marking the tail board.*



F. *Positioning template on pin board.*



G. *Squaring down the pin lines.*



H. *Routing waste for half-blind dovetails.*

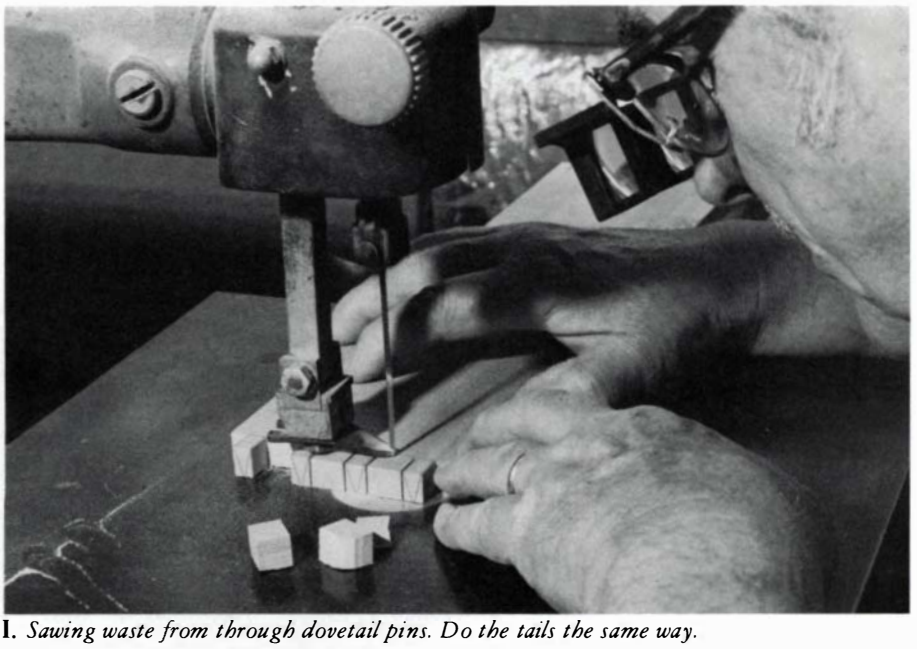
The next step is to cut the tails and rough out the pins of the drawer back (**I**) on the jigsaw. A band saw can be used, but a jigsaw will give better results. Use a sharp, fine-toothed blade, 3/32 in. to 1/8 in. wide, tensioned enough not to wander. Don't depend on your unmagnified eyesight here. I use 4× magnifying glasses and seldom have to touch a chisel to the tails or pin bases after jigsawing. Saw just to the waste side of the scratch-awl markings on the inside face highlighted by the pencil.

After the pins are cut on the jigsaw they will, of course, be square pegs that must be brought to their final triangular shape with a paring chisel. Don't try to chop down in one or two large bites. Nibble off fine shavings as shown (**J**). The chisel must be as sharp as a razor. The first cut will give the indication of which direction the grain is going. If the grain runs into the pin, pare in horizontally from one face or the other, holding a stout piece of wood against the opposite face of the pin so the wood will not break out as the chisel cuts through. Here again, use the magnifiers and place the chisel in that fine, light line between the pencil markings to make the final shave.

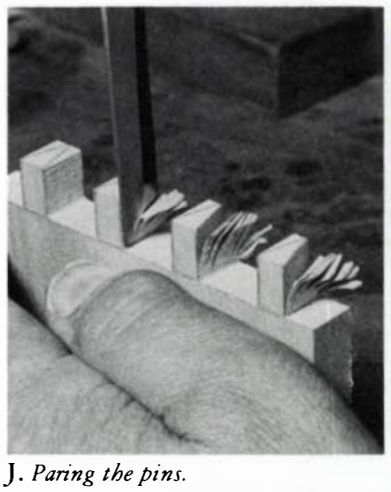
To cut away the shavings and clean up around the base of the pins, I use a spear-pointed chisel I made from a 1/4-in. straight chisel by grinding it to a 30° point (**K**). It is much better than a skew because it cuts on both sides and can be held flat on the pin baseline while severing the shavings. Its usefulness is fully appreciated when cleaning up the pins for a blind dovetail joint, as no square-edged chisel can quite get into the acute corners.

Now that you have carefully followed that fine, light line with sawblade and chisel and a careful inspection shows no more trimming to be necessary, you can assemble the pieces (**L**), and tap the tails home using a hammer and a block of wood. If you have done all your cutting with the care needed to make a dovetail joint, the pieces should go together with a firm "thunk" and you'll have to go out and buy a new hat because your old one will never again fit.

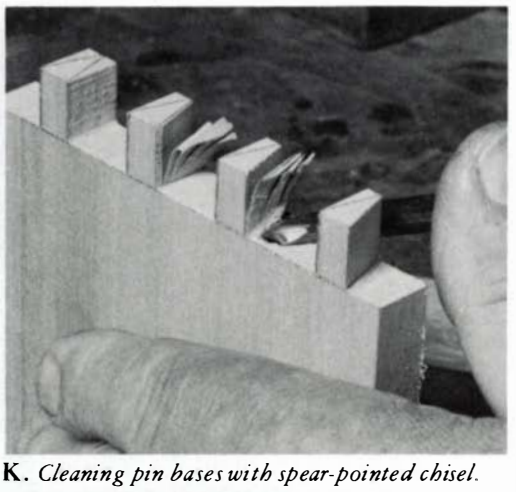
Glue up only after you're sure all the parts fit with no binding or excessive pressure being brought to bear. Apply glue to the pins only and clamp with just enough pressure to snug up the joints. Too much will cause bowing and will produce an out-of-square drawer or case with poor joints. Use a try square on the inside corners to make sure this is not taking place. □



I. *Sawing waste from through dovetail pins. Do the tails the same way.*



J. *Paring the pins.*



K. *Cleaning pin bases with spear-pointed chisel.*

L. *The completed joint.*

Chisels, and How to Pare

Master the grip and stance before tackling joinery

by Ian J. Kirby

The first step in learning to work wood by hand is mastering the three basic cutting tools: the chisel, the plane and the saw. Each tool requires its own hand grip and body stance for the most effective transmission of power to the cutting edge. The best way to acquire skill is to practice using each tool until the proper techniques become second nature. In this article, I'll illustrate these concepts by showing how to use woodworking chisels.

I cannot overemphasize the importance of practicing fundamental tool skills before you attempt to make joints, let alone whole pieces of furniture. I constantly find beginning woodworkers who are struggling to learn some vital technique in the course of making furniture, with no attempt to develop and perfect their skills before the main event. The result will at best be a nondescript article of furniture that prominently features the scars of its maker's struggle, and at worst it will be failure and disillusionment. Either way, it seems futile. On the other hand, once you have learned how to use the tools, making joints is a simple procedural application of those skills; making furniture is, in large part, the application of jointmaking skills. No manipulative skill is acquired without practice. The potter, the dentist, the athlete—indeed, anyone wanting motor skills—must practice, and practice hard. The woodworker is not exempt.

Fortunately, all of woodworking can be broken down neatly into a series of skill-development processes. In particular, total control of the chisel can and should be learned by diligently practicing horizontal and vertical paring, nothing else. The photo essay on pp. 72-75, therefore, proceeds first through horizontal paring, then vertical paring, and then shows the application of these techniques (plus sawing) to the through dovetail joint. I can only urge you to accept that it will be worth your while to practice with the chisel until you have mastered it before you spoil any good wood.

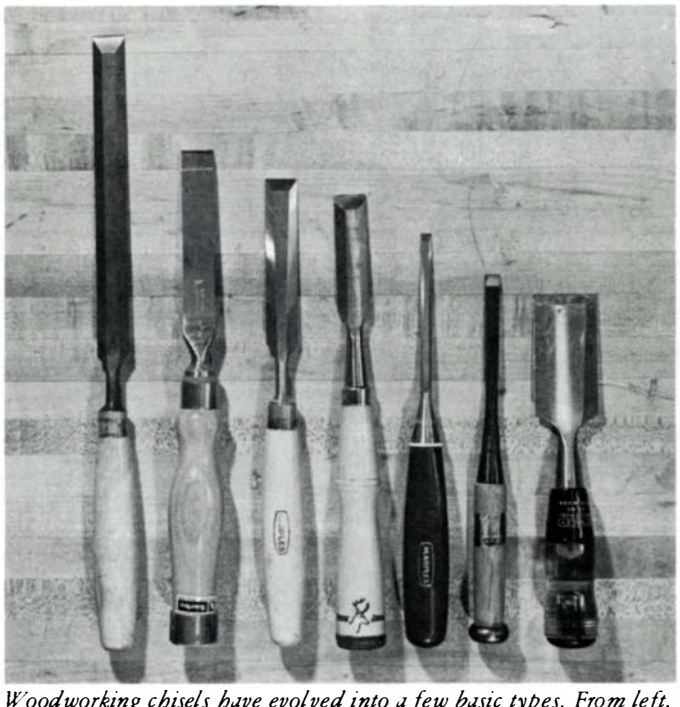
Central to becoming skilled with the chisel is learning the proper hand grip, and from that point on, going right through the body to the soles of the feet, learning the relationship of each part of the anatomy to the next part. After the grip, we must be concerned with the forearms and upper arms including the shoulders, next the trunk in relationship to the arms, then the pelvic girdle and legs, and finally the feet. To achieve just what's wanted at the cutting edge, the whole body must participate and be in accord. I find that most beginners are conscious of their relationship with the tool up to the shoulder, where their awareness seems to end.

Since there are two main ways of paring with the chisel, there are two different grips and stances to learn. Note that in either mode, both hands are kept behind the cutting edge. There are not too many universal rules in woodworking, but this has to be one of them: when using a chisel, power it with one hand, guide it with the other, and avoid a nasty cut by keeping both hands behind the cutting edge. It goes without saying that your chisels must be perfectly sharp.

Although many different chisels are available on the market, when you are deciding which to buy, there are only a few factors to consider. In terms of blade section, there are just two types: the square-edged or firmer chisel and the bevel-edged chisel. The firmer can do heavier work, and can even be pressed into service for mortising. The bevel-edged chisel (there is no standard blade thickness or bevel angle) can get into such tight places as pin sockets between dovetails and is most suitable for furniture-making.

There are three common blade lengths: patternmaker's (8 in. to 10 in.), bench (5 in. to 7 in.) and carpenter's or butt (3 in. to 4 in.). Patternmakers need a long chisel to reach into deep, awkward places. I prefer the long blade's feel and balance, and it seems easier to control. Patternmaker's chisels are nearly always bevel-edged, and are also made with a cranked handle for paring far out on a flat surface. The bench chisel is commonest amongst furniture-makers, whereas the butt chisel, a phenomenon of American mass manufacture, is the least useful.

For handles, the most prized commercial wood is boxwood; the usual alternatives are ash and beech. The handle is generally driven onto a tang that has been formed atop the metal



Woodworking chisels have evolved into a few basic types. From left, patternmaker's chisel, firmer, standard bevel-edged chisel with boxwood handle (the choice of many furniture-makers), socket bench chisel, Blue Chip, Japanese and butt.

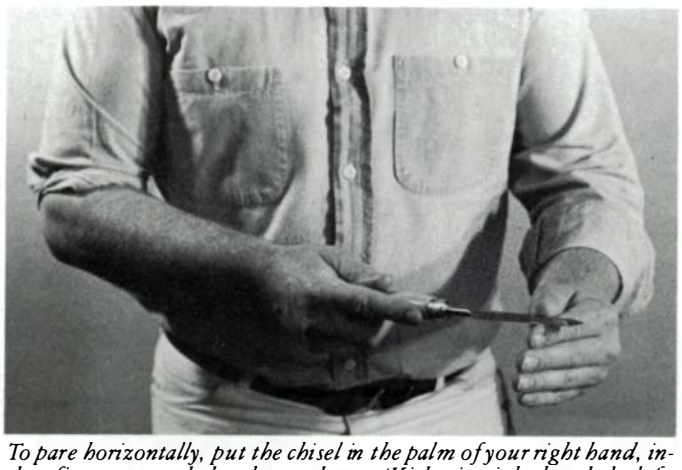
Ian Kirby teaches design and woodworking methods at his studio and workshop in North Bennington, Vt.

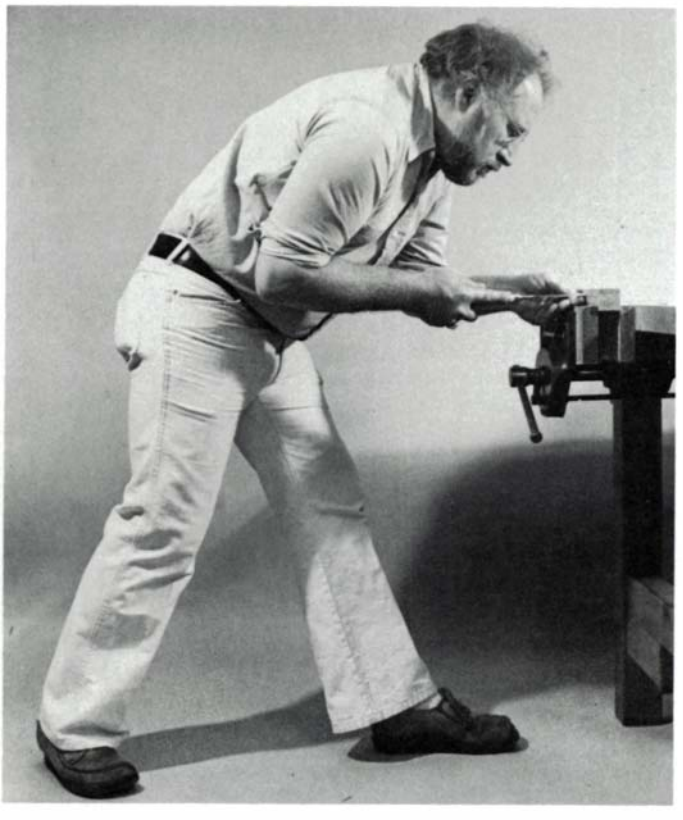
blade, and seats against a bolster formed between tang and blade. Firmers, in order to withstand pounding, generally have a thick leather washer between bolster and handle, plus metal ferrules top and bottom. Paring chisels, which are not to be struck with a mallet, usually have a single ferrule (at the bottom of the handle) and no washer. A third style, called a socket chisel, in which a tapered cylinder turned onto the handle fits a conical socket in the end of the blade, can also absorb heavy pounding. Handles made of high-impact plastic are quite as good as wood. They are generally formed around the tang and have no ferrule. Even so, they can be driven with a mallet. Once there were numerous handle shapes, and chisels were named after them. Today manufacturers seem to have settled on relatively simple turned forms for both wood and plastic, although recently plastic handles have been injection-molded into new shapes as a result of research into effective grips for maximum control. The Marples Blue Chip, a rounded square in section, is one example.

The Japanese chisels now available generally follow the form of Western chisels, with one exception. The back of the blade is hollowed out, except at the cutting edge. This makes stoning the back of the blade a little easier.

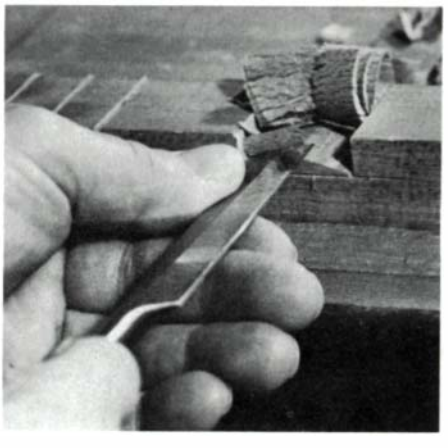
When buying chisels, you get what you pay for. I'm inclined to stay with the well-known manufacturers because they use steel of appropriate and reliable quality. On a tight budget, I'd start with bevel-edged bench chisels in widths of ¼ in., ⅜ in. and ¾ in., filling out the set as need arises and finances permit. Since plastic handles are molded in place, they are usually in line with the blade from top and side views. This is not always so with wooden handles, so be sure to check. Also, examine the back face (flat side). Except for Japanese chisels, it should come ground absolutely flat, although it is often made convex by overly enthusiastic finishing at the foundry. Having to flatten the back can cost you hours of work at the sharpening stone. To avoid slicing the left-hand index finger, which guides the chisel, always take the sharp edges off the length of the blade. Place the chisel at 45° to its back on a medium stone and give it about ten light strokes. As with any tool, buy the best you can afford. One good chisel is better than two poor ones.

Horizontal paring

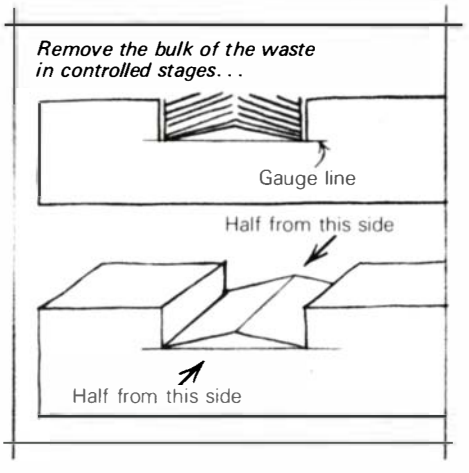


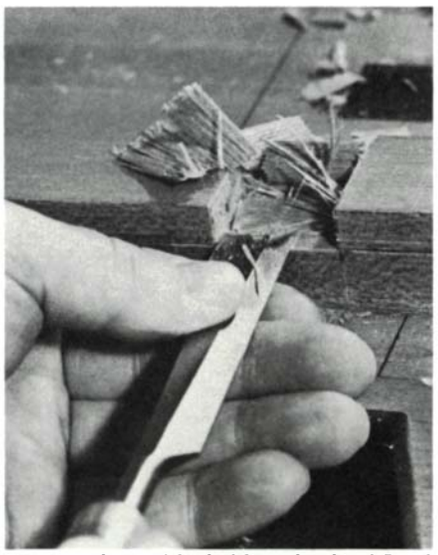


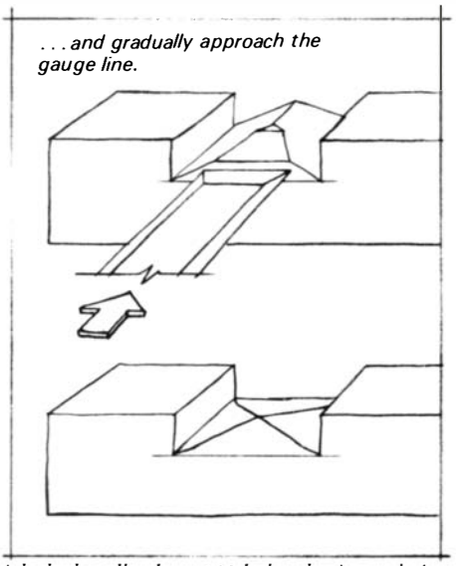
To pare horizontally, put the chisel in the palm of your right hand, index finger extended, photo above. (Kirby is right-handed; left-handers will have to reverse.) Line up blade, finger and forearm—this is the line that transmits the body's power. Rest the back of the chisel blade on your left forefinger, thumb on top, back of hand toward workpiece. This hand guides, and brakes, the cut. Now stand at the vise, take a step back with your right foot, and turn the foot so it's almost parallel to the bench edge, photo right. Bend at the waist and lock your right arm so your elbow is on or near your hip. Now push off with your right foot so the whole movement comes from your lower body and legs—your arms and trunk stay locked. You'll quickly find the most comfortable link of arms and body to suit your physique.



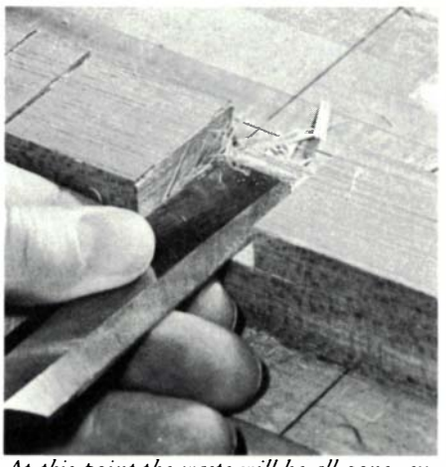
Horizontal paring is done on end grain when cleaning out dovetails (p. 75, step 7), and on cross grain when cleaning dadoes and cross-laps. In either case, the wood fibers must first have been severed by sawcuts down to a gauge line. Then the waste comes out in stages, half from one side, half with the work turned around. The pattern of paring is the same, cross grain or end grain. To practice, mark out and saw a cross-lap housing in a length of 2x2 hardwood (lauan in the photo). Pare horizontally to just beyond the middle of the work, but tip the chisel alternately left and right so you reach the gauge line at either side of the housing while leaving a peak across the middle. The drawing at right shows this strategy of approaching the line in controlled stages.



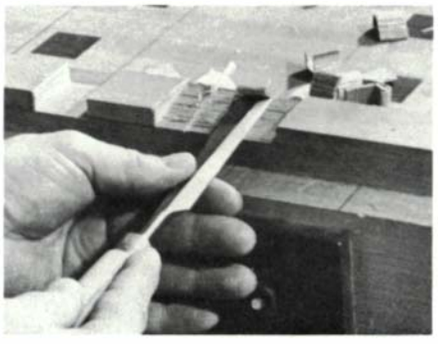


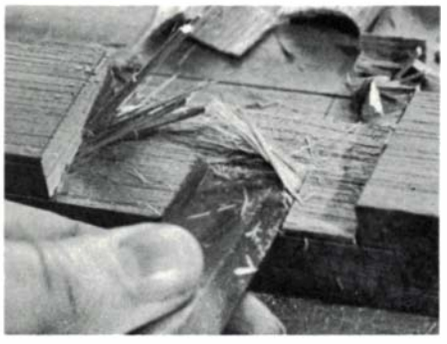


Remove the peak by holding the chisel flat, but with the handle about 10° below horizontal. As you approach the gauge line, the cut will slope upward away from you. Click the chisel edge right into the line for the last cut, but maintain the upward slope. Then turn the work around in the vise and repeat from the other side.



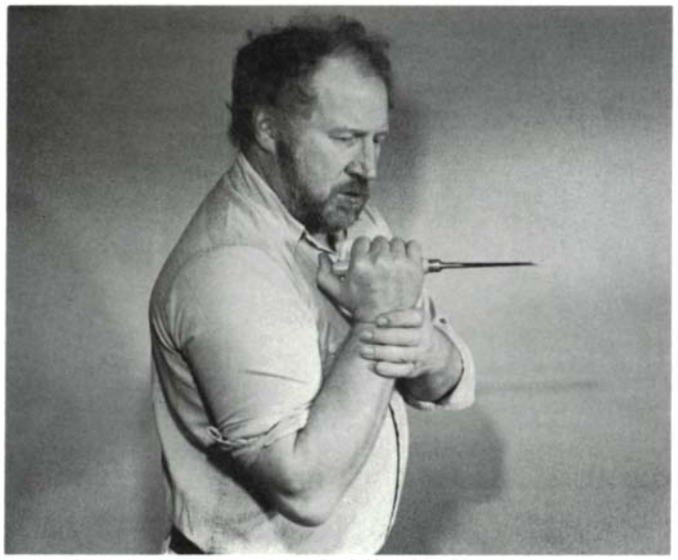
At this point the waste will be all gone, except for a small pitch in the middle of the housing. Remove it by raising the handle closer to horizontal with each cut, until on the final pass you feel the chisel go onto the gauge line on your side and see it exit on the gauge line at the far side. A little nibbling to clear out the corners, and you're done.



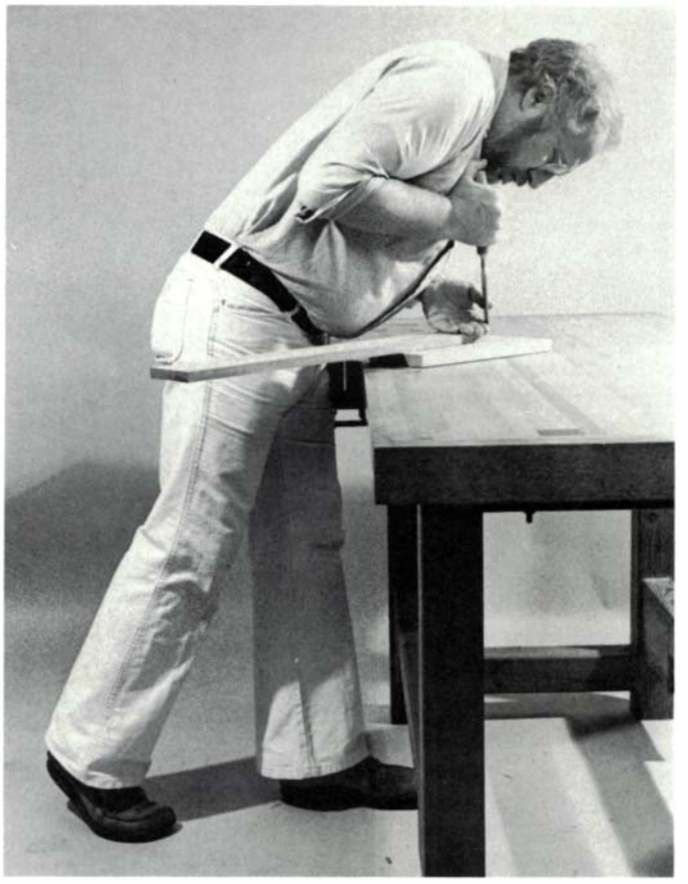


To cut a wide housing, saw the shoulders and saw a series of crosscuts spaced a little less than a chisel width apart. With the handle lower than horizontal, work a flat slope from one side and then the other, leaving a center pitch. Take small bites. The final cuts, as before, go from gauge line to gauge line. You'll find that this grip and stance provides ample power and control—the chisel should never come flying out of the wood on the far side. If it does, take smaller bites to get control of the relationship between the hardness of the wood, the sharpness of the tool, and your own strength.

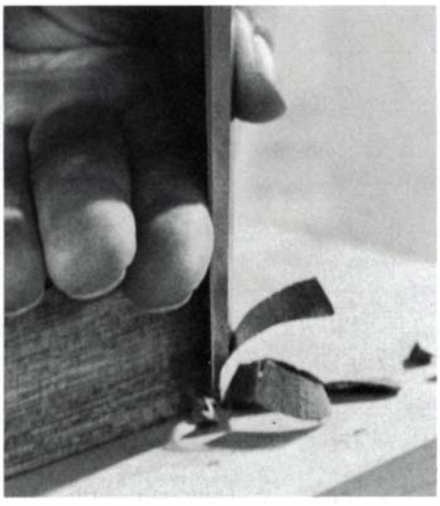
Vertical paring

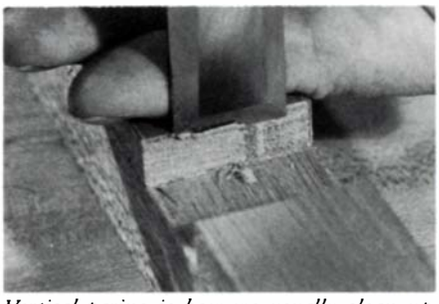


Vertical paring requires an entirely different grip and stance. Hold the chisel as if it were a dagger, thumb on the handle's end. Try to tuck your thumb into your shoulder joint. Rest the back of the chisel's blade on the middle part of your left index finger, left thumb on top of the blade. Stand with your left foot forward, and bend from the waist so the back of your left hand rests on the work. Lock your arms, rock your weight onto the forward foot, and flex your knees. All downward power comes from the hips and shoulders, not from moving your arms. Your head should move only as far downward as the chisel's edge moves, and no farther. *(continued, next page)*



This grip enables you to concentrate the whole power of your body onto the cutting edge. The left hand, braced on the work, provides fine control and acts as a brake. Practice by paring the corner off a block of wood—you'll readily see, quickly learn to sense, any variation from the vertical.





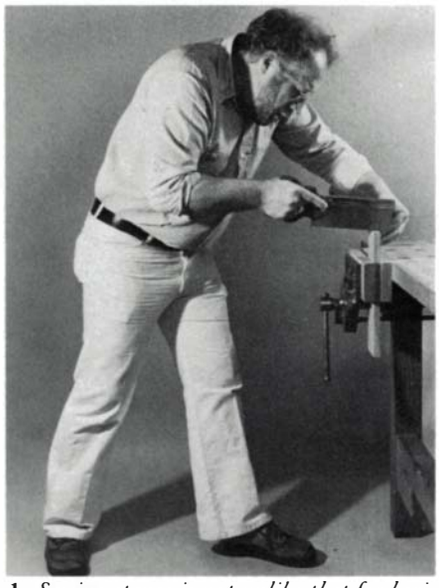
Vertical paring is how we usually clean up tenon shoulders. You can practice on the walls of housings cut in the horizontal paring exercise. With a ¾-in. chisel, place about half the blade's width in the knife line and pare straight down. Move over half the chisel's width for each subsequent pass, using the knife line and the surface previously cut as your guides. Try to sense how every part of your body functions in relation to the tool, the workpiece and the bench. Practicing these basic techniques is worth all the effort you can muster, for confidence here will make joinery an automatic and simple procedure, not the tense and chancy event that discourages many beginners.

Chisel skills and the through dovetail

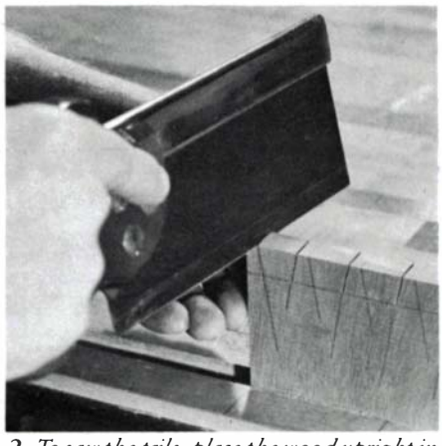
Paring with the bench chisel is one of the prerequisite skills for making through dovetails. The other major skill is sawing, which I've discussed in my articles on the mortise and tenon joint (*FWW* #13, #15 and #18), but which I'll review in the following photo sequence. I suggest that you practice dovetailing with hardwood stock about ⅞ in. thick and 4¼ in. wide. From the start, get into the habit of preparing the ends of the stock clean and square, by crosscutting with a carbide blade or else by knifing deeply around and hand-planing the end grain. When making drawers and casegoods, this end-grain surface is the register that governs final fit (*FWW* #21, March '80, pp. 73-76).

It's possible to start the joint with either the tails or the pins, but I prefer to begin sawing the tails. This is because the tails are not cut straight down, but to an angle, and the saw is liable to wander. It doesn't matter whether the angles are constant, only that all the cuts are straight. If you make the pins first and transfer their angle to the tails, then you must cut a constant angle to a line—a constant angle not on the line won't do. If you have never practiced sawing down a line, draw a multitude of lines on scrap and just make cuts. It's worth emphasizing that the joint is made entirely from the saw. There's no need to chisel or file the side grain of the pins or tails. Although the joint has been elevated to a sort of ultimate standard, it's in reality simple—in no way as difficult to make as the mortise and tenon. Don't be afraid of the dovetail.

Begin by gauging a line just less than the thickness of the stock at the ends of both pieces. After assembly, the outside surface of the stock will be planed to this thickness. Hold the wood upright in the vise. Using ¼-in. and ¾-in. increments, square lines across the end grain of the tails piece with a sharp pencil. I set the sliding bevel to a slope of one in six to mark the lines down what will be the outside of the joint (for practice, mark both sides). I carry these lines several inches below the gauge line to make it easier to sight the saw.



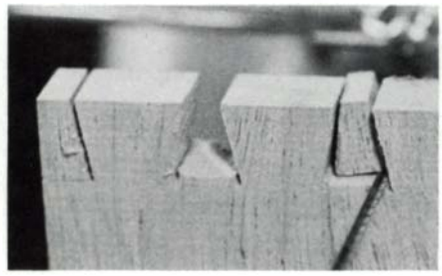
1. *Sawing stance is not unlike that for horizontal paring. Three fingers grip the saw, with the index finger extended. With feet well apart, wrist locked, power comes from the shoulder and upper arm. The other hand guides the saw into the work. A good preparatory exercise is to grasp the saw, close your eyes, and attempt to set the teeth down on the bench—level and square. Open your eyes, check with a try square, and try again.*



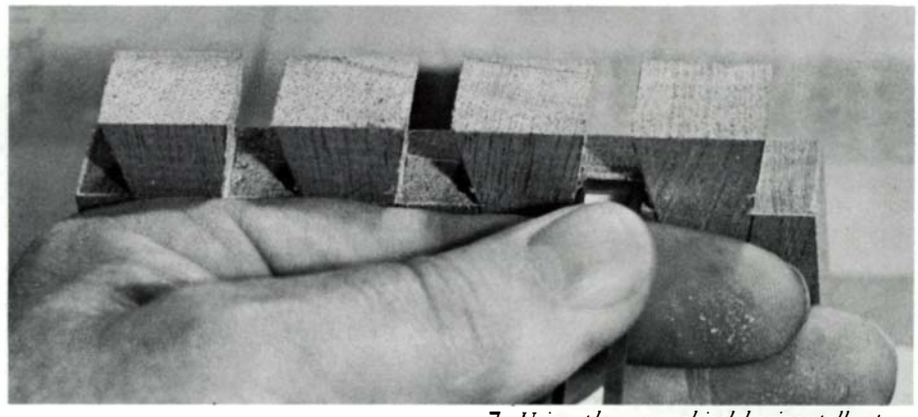
2. *To saw the tails, place the wood upright in the vise. Square lines drawn right on the vise make this easy. Some people put the wood at an angle so they can saw straight down, but it's better in the long run to learn control. Start the cut with the saw at the tail angle, on the far edge of the wood. Spend the first strokes bringing the kerf across the end grain, then bring the sawteeth to level. Saw down the outside of the pencil line, leaving no wood between line and saw. Don't try to adjust the angle mid-way—you must have a straight cut. Do try to keep the sawteeth horizontal. When you are down to the gauge line at the front, you will also be down to the line you can't see at the back.*

3. *Leave the wood upright in the vise and, standing as at left, remove the bulk of the waste with the coping saw. Its blade should slide easily into the kerf, down to within ⅛ in. of the gauge line. Rotate the saw's frame to twist the blade in the kerf, and it will turn the corner in its own thickness.*

4. *With practice, it's easy to keep the saw horizontal, and to cut very close to the gauge line, below. Some people chop all the waste out with a chisel. This is laborious, and some woods crumble so badly that the chisel pulls material out of the root of the joint.*



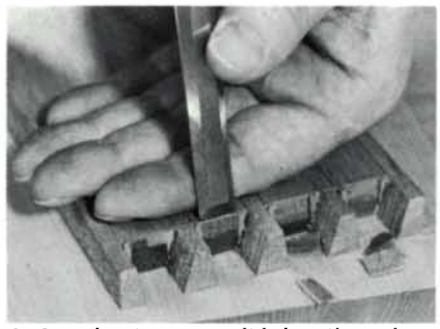
5. *Turn the wood on its edge in the vise and saw out the waste where the half-pins will fit. Clean up this shoulder by vertical paring, before turning the wood to do the other edge.*



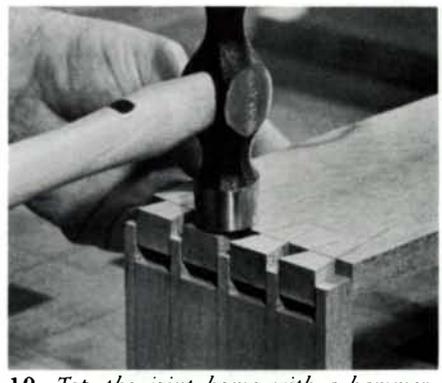
6. *To clean up the bottom of the joint, select the widest bevel-edged chisel that will fit between the tails and lay the wood flat on a cutting board. Pare down from both sides with the chisel about 10° back from 90° (left), until you can place the chisel into the gauge line. What's left is a small pitch in the middle of the joint. To remove it, place the wood upright in the vise.*

7. *Using the same chisel horizontally, pare straight across from gauge line to gauge line. The resulting surface will be flat and square, exactly where it should be. There is no virtue in undercutting the end grain, and no need to do so. Among other things, you lose the positive nature of the internal fit. Note that the initial incision made by the cutting gauge is where you finally place the chisel. An important part of the joint was completed at the start of marking out—a common condition in woodworking.*

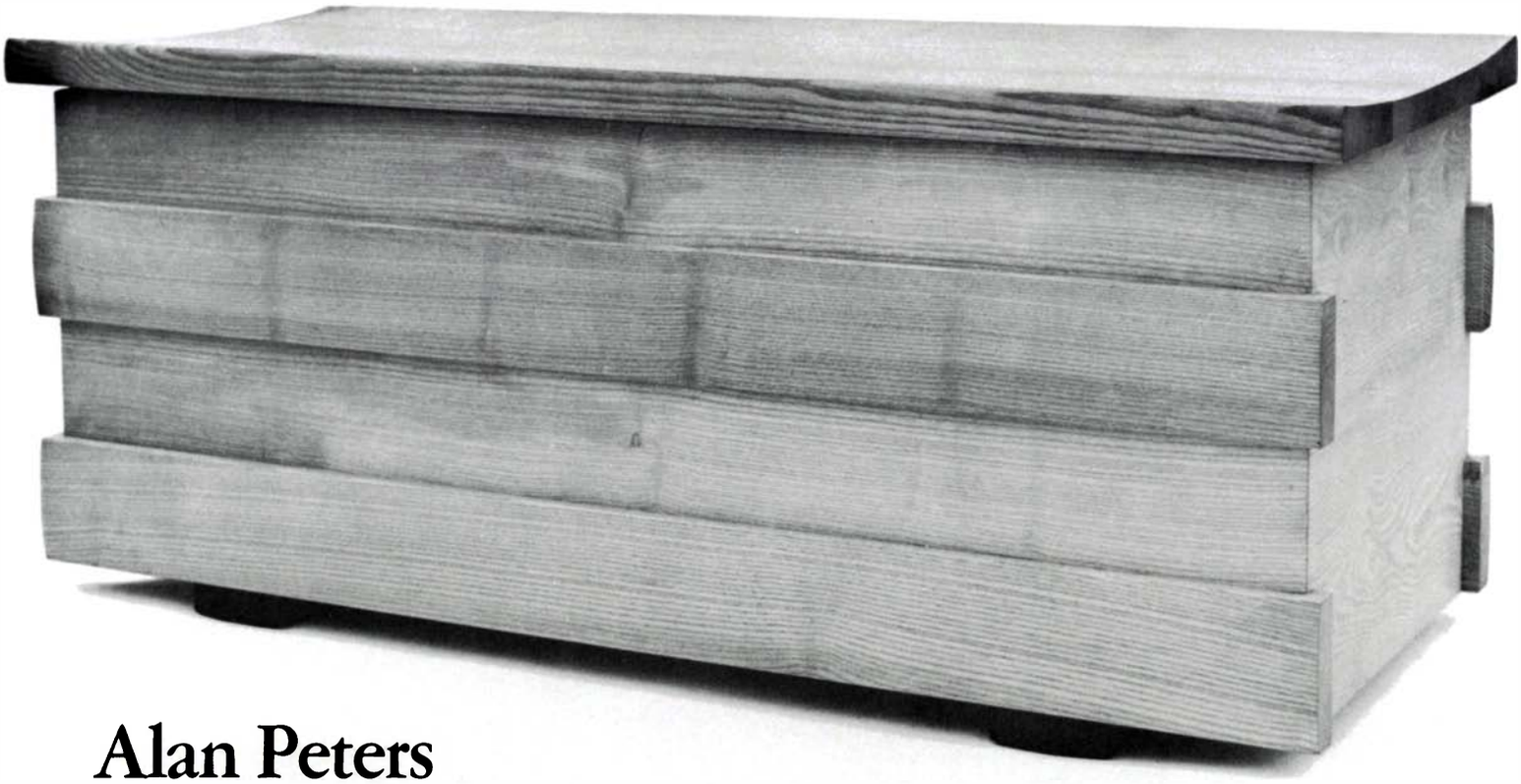
8. *Now put the pins piece in the vise, projecting ⅛ in. above the bench top, and align the tails piece on it. You can adjust the fit of the joint according to the density of the wood by moving the tails piece minutely backward or forward. A tight joint in mahogany, which crushes easily, would be too tight in hard maple. Use a sharp knife to transfer the tail profiles, bearing down hard toward the outside corner. Then, with a square, pencil these lines several inches down the wood.*



9. *Saw the pins as you did the tails, endeavoring to split the knife line. If you fear the line, study what you are doing through a magnifying glass. You'll see that it's quite possible. A method of reminding yourself which side is the waste side is to leave the tails piece in position on the bench. Remove the waste with the coping saw, then pare the end-grain flat. Use the widest chisel that will fit the narrow side of the aperture, and sweep it askew to reach the whole surface.*



10. *Tap the joint home with a hammer, directing each blow to the center of each individual tail. You don't need a block of scrap to protect the wood, and you shouldn't substitute a mallet because it's liable to damage the work. On a wide joint, you'll hear a change in pitch as the hammer strikes a tight tail. This is the best way to isolate just which part of the joint needs adjustment.* □



Alan Peters

From Arts and Crafts to Chinese Gothic

by Simon Watts

The furniture of Alan Peters is well known in England and deserves to be better known in America. A quiet yet articulate man of 49, Peters is respected in his own country not only for his innovative designs and superb craftsmanship but also for the sheer drive and tenacity that have made him one of England's leading furniture makers. His work has been exhibited widely and can be found in offices, banks, churches and embassies, as well as in private homes. A photo of his award-winning desk in Macassar ebony, mahogany and stainless steel appears in *FWW* #17, July '79, p. 83.

I visited Peters at his home in Devon, a 16th-century farmhouse he restored himself. Here one can see a consistent standard of excellence throughout the house: kitchen cabinets, doors, bookshelves, even the umbrella stand are carefully designed, and most were made by Peters' apprentices as part of their training. I sat in the low-ceilinged living room with a snack, and while Alan was fiddling with a smoky fire, I asked him how he got his start in woodworking. "My father wanted me to become an engineer," he replied, "but I wasn't much interested in metal. I spent all my school days whittling away with a penknife making airplanes."

Ash chest, top and above, 60 in. by 20 in. by 16 in., is one of Peters' favorite pieces. 'I didn't want this chest to be a clever piece peppered with dovetails. It's going into a medieval house, and I just wanted the chunkiness, the shape. The corners are mitered with a spline.'

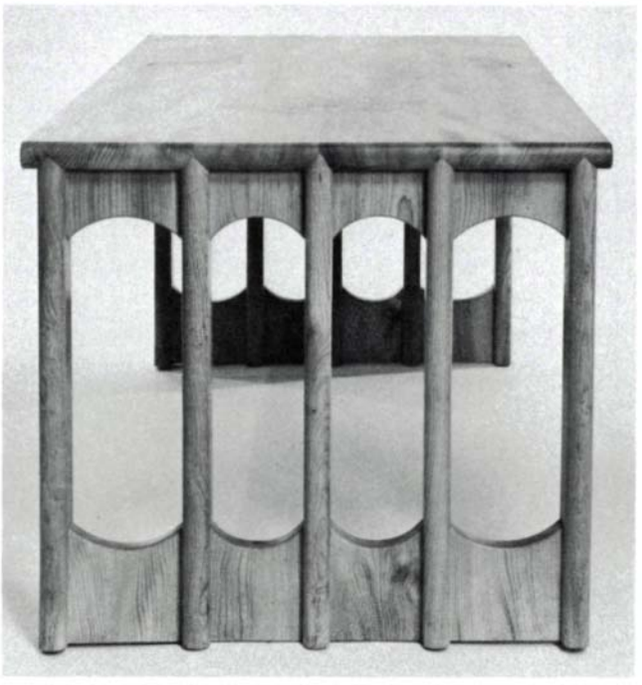
The Peters family lived in Petersfield, Hampshire, only a few miles from the man who is still England's foremost furniture-maker, Edward Barnsley *(FWW* #16, May '79). At 16 Alan was fortunate in being accepted as Barnsley's apprentice, and for the next seven years he bicycled the three-mile hill between his home and the Froxfield workshop. Trained in the earlier tradition of William Morris and the handicrafts revival movement, Barnsley did not have electricity in his shop. There were no power machines, and all cutting, planing, jointing and resawing was done by hand.

"It was a very busy place," Peters recalls. "There were twelve of us in a very small space with the benches all lined up side by side. I was the one who had to sweep off their benches, make the tea and everything else. I spent weeks just stacking timber. We had a treadle-operated circular saw and a mortiser that took so much brute force to operate we seldom used it. Chair legs were cut out with a bowsaw and everything was surfaced by hand." In spite of

Photos, except where noted: Aller Studios

having to work so close to the oil lamps (the only lighting) that he often scorched his hair, Peters values the experience of having had to work entirely by hand. "There are times now when I plane up by hand. My chaps think I'm mad, but if I were training young people, they wouldn't touch a machine or a piece of sandpaper for the first two years."

After completing his five-year training, Peters had a year in the army and then returned to work in Barnsley's shop. During this period, Barnsley and his foreman, Bert Upton, recognized the economic impossibility of continuing to work entirely by hand. So the shop was wired for electricity, and machinery was finally installed. This coincided with a dramatic shift in Barnsley's style. Up until the mid-fifties his work was a direct carrying-on from Gimson and the older Barnsleys, consisting of solid pieces almost all in native timbers—oak, chestnut, walnut. Then in came mahogany, rosewood, those delicate lines of inlay reminiscent of the 18th century and Regency—a tradition quite alien to the spirit of the Cotswolds and the handcraft revival. (For more on Gimson, the Barnsleys and the Arts and Crafts Movement, see *FWW* #26, Jan. '81). "It was a very strange thing," says Peters. "In some people's eyes Barnsley betrayed a tradition and went backwards, but who's to say in fifty years' time if he went forwards or backwards?"



Yew table, 48 in. by 20 in. by 18 in., was the first piece Peters made in the Chinese Gothic style on his return from the Orient. The uprights are mitered into the top, typical of Chinese joinery.

Peters left Barnsley in 1956 with no expectation of ever being able to open his own shop. He had no capital, and loans for craftsmen were impossible to obtain, so he decided to take a teaching job that would give him enough spare time to continue designing and making furniture. Following a two-year course at a teacher-training school, he won a scholarship to study design at the Central School for Arts and Crafts in London. After several years of teaching, he and his wife, Laura, took the plunge and opened a shop at Frensham, some 50 miles from London.

The first few years were very difficult. "The bank managers were the bane of my life," Peters recalls with bitterness. "We couldn't get any money off any of them so we had to buy the machinery on tick—an expensive way of doing things." He had to take on a great variety of work to stay in business. He feels that some of his early pieces were compromises in design, but not in quality. "There were certain things I would never do" he says, "like making reproductions—I just hate them—but I did do built-ins, high-class joinery, and prototypes for industry. I think one of the problems with young people setting up their own shops is that they have such terrifically high ideals. It makes it hard for them to make a living. I was never too proud to do anything. If someone had asked me to make a toilet seat I would have done it—and it would have been a good one."

It took Peters a number of years to mature as a designer and develop a style with which he felt comfortable. His apprenticeship with Barnsley and his training in industrial design were in conflict with each other. His early pieces reflect both these influences—crisp industrial designs of the early sixties with overtones of Edward Barnsley. Now, after sixteen years on his own, Peters has developed a style of his own, though he points out, "I still retain a lot of the discipline that I got from Barnsley and he got from his father and Gimson—a love of through joining used as a decorative feature, for example."

In 1974 Peters and his wife bought their farm in Devon, 150 miles from London. They turned the outbuildings into workshops and lumber storage, and the family moved in with children, furniture, tools and machines—and a full book of orders. The main workshop is on the ground floor of a stone building across the yard from the house. Peters "has to have a lovely view," and from each workbench one can look out over the rich farmland of south Devon. He also has to have quiet—no radio, no telephone and little conversation. For this reason most of the machinery is across the yard in another building. Above the workshop is an office and a showroom lit by skylights, and with its raised platform at one end it feels like a small, private chapel.

Peters is well aware that the move to Devon has altered his style: "It's got chunkier," he says, "and I use more solid timber." He attributes this in part to the fact that for the first time he has had the space to store and dry his own lumber. Also, living further from London, he gets fewer orders for office furniture, which has to be done in veneers to avoid the shrinkage problem in dry, overheated office buildings.

He used to make quite a lot of office furniture but felt that these were impersonal pieces, that his having made them meant little to the owners. "I now prefer to work for private individuals," he says. "It's very important for me to like the people—I have to like them for the best to come out—but the standard of workmanship remains the same." Peters also knows that a designer can't afford to ignore fashion. He puts it this way: "The refined elegance of the sixties—the tapery little legs, everything whittled down—has gone, and the tendency is to come back to chunkier forms. My thinking has changed, too. I once thought the early work of Gimson was so heavy—all right for the stone cottages of the Cotswolds—but now I look at it much more sympathetically because I realize we've got closer to it."

Peters buys most of his wood green, then has it sawn and stacked in unheated, stone outbuildings. Even after two years under cover, the lumber may still have a 20% moisture content—too high for furniture using conventional construction. Bought kiln-dried, wood takes on moisture rapidly in the damp, west-country climate unless enclosed in a heated

building. I asked Peters how he overcomes this problem. "I have to have lots of time on a job," he replied. "I cut out the timber, usually in the fall, six months before I start making the actual furniture." He cuts the stock out large, and always more than needed, brings it into the shop and stacks it up above where it's warm. "In effect we do our own kiln-drying in the shop," he says. "I have a dehumidifier and keep the heat on all the time. So often you cut a board and a week later it will have drifted [warped] or developed cracks and shakes you just didn't see at the time. I try to avoid spending hundreds of hours on a marvelous piece of furniture and then have the wood let me down." It also means a great deal of planning and having material tied up for half a year.

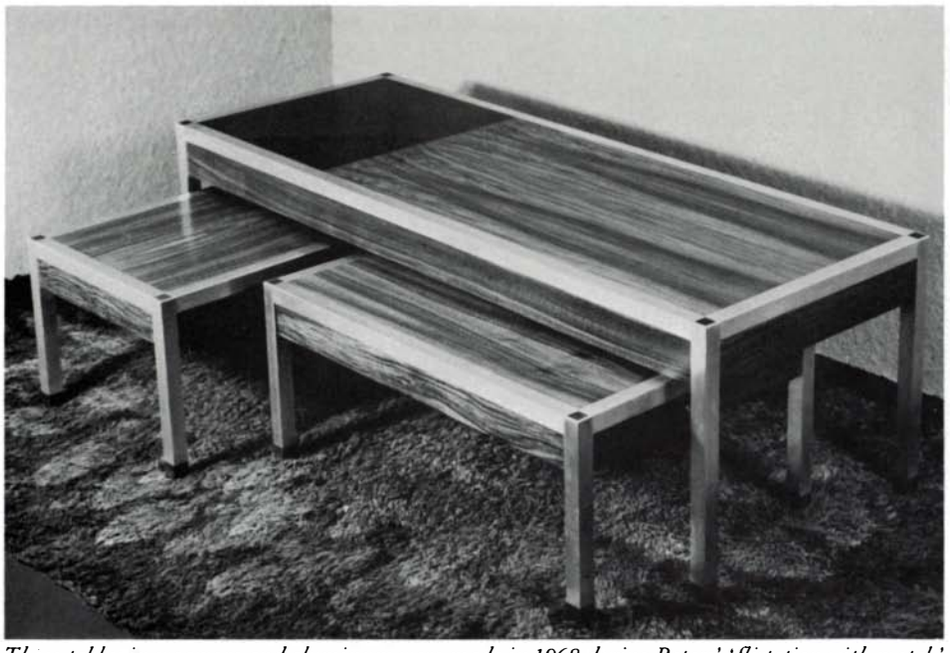
"It's terribly difficult to be an original designer—I don't claim to be one. Most of us have to be content with an element of originality, but I do like to think that there is a thread going all through my work. I am not sorry that I don't have a strong personal style because I am designing for so many different situations. One day it's for a sixteenth-century farmhouse and the next for a director's office. I think that it's a bit arrogant to force one particular style on everyone. I try to design for the situation."

Solid wood is always on the move, and Peters tries to "design out" problems caused by swelling and shrinking before they arise, either by using details that allow for movement or by immobilizing the wood altogether through veneer construction. These strategies are well illustrated by the yew table (photo, previous page) and the writing desk (facing page, bottom left). In the table, the grain of the arches, the posts, and the top surface all runs the same way so that the piece can swell and shrink as a unit, without conflict. The desk is a mixture of solid woods and veneer. The arches are laminated, with a solid lipping, and the end frames cannot move at all. "I'm not a purist," he says, "but I use the best method of construction for each piece."

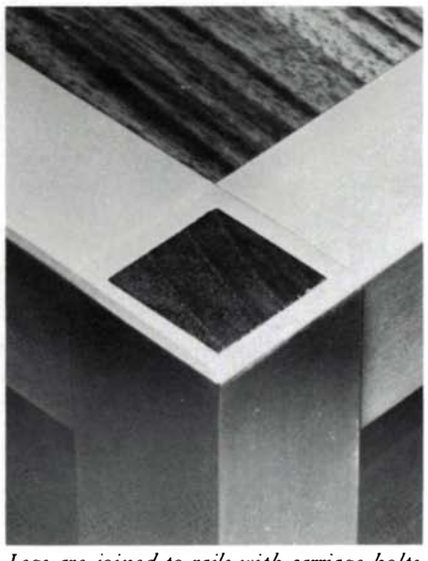
Peters' interest in Oriental furniture goes back a good many years. In 1975, shortly after the move to Devon, he got a grant to go to Japan. The opportunity came at a good time. Design in England was in a state of depression. There had been a reaction to the clinical style of the period, and designers were searching for new forms. There was even a revival of interest in some of the more vulgar aspects of Victorian furniture; this horrified Peters. He went to Japan to learn about the decorative inlaying of metal but was struck by the simplicity of things there. "Japanese art," he says, "has a very contrived simplicity: those curved roofs didn't just happen, the gardens with the rocks sitting in them—it's all so terribly well thought out. I like to think that a lot of my work is like that—basically very simple—and I will go to tremendous efforts to achieve it. But getting this curve just right, that rail exactly the right dimension, is often far from simple."

This theme of "contrived simplicity" appeared in Peters' work long before he went to Japan. In the tables shown below, three hollow pieces of aluminum meet to form the corner. Visually simple, the joint tells nothing of the mechanics that hold it together, and contrasts with the more visible techniques of through dovetailing and wedged mortise-and-tenon joints. Some of the later pieces, such as the bench shown at the top of the facing page, combine blind and through joinery. It is this quality of surprise and technical mastery, subordinated to a strong visual concept, that makes Peters' work so exciting.

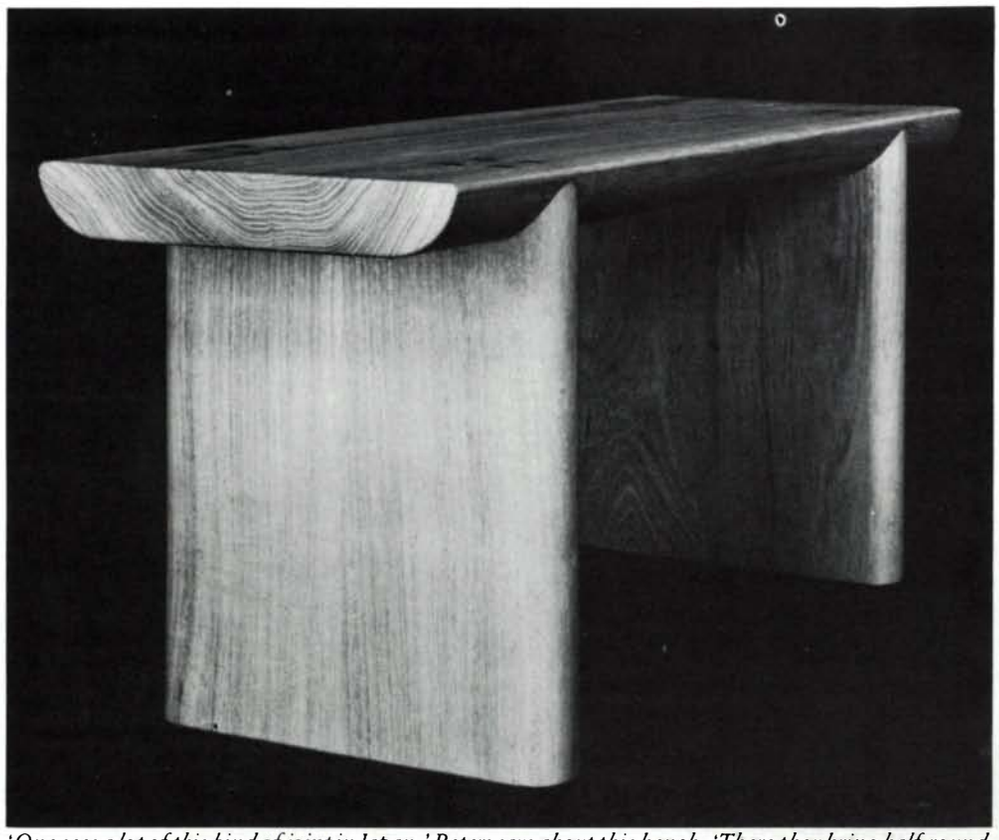
The first Sunday after returning from Japan the family walked over to the local parish church—one of the few that has escaped the Victorian mania for restoration. "I was sitting in this medieval pew," he recalls, "with my eyes half closed as I often do, and there it was. It had been done centuries before. I call it my Chinese Gothic and it's a combination of those lovely Chinese details and the Gothic arch. The yew table evolved over the next fortnight." Peters used his Chinese Gothic again in the writing desk and then moved on

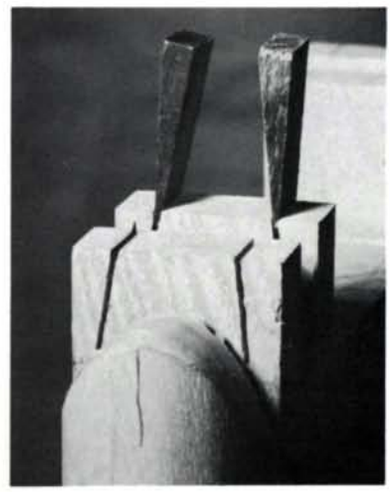


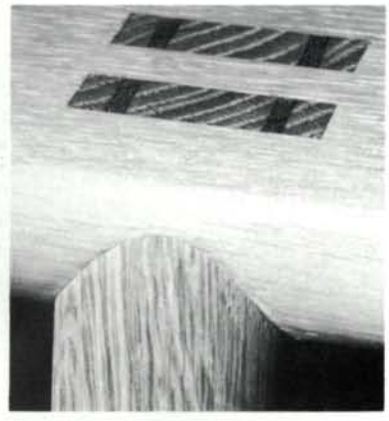
These tables in sycamore and aluminum were made in 1968 during Peters' 'flirtation with metal.' They are good examples of the kind of visual simplicity Peters strives for. But the mechanics of the joint (detail, right) are far from simple. Photo: Peter Waller.



Legs are joined to rails with carriage bolts embedded in wood plugs. The legs are drilled and a nut tightened from the top; then the opening is plugged with sycamore. Epoxy ensures that the nut stays put. Finishing all the surfaces flush is 'a helluva lot of work.'

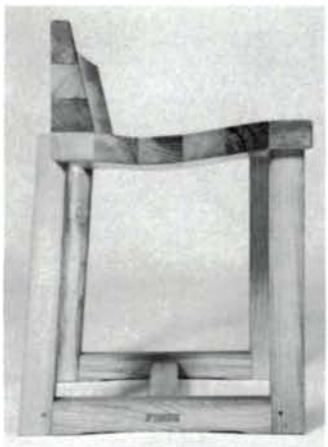






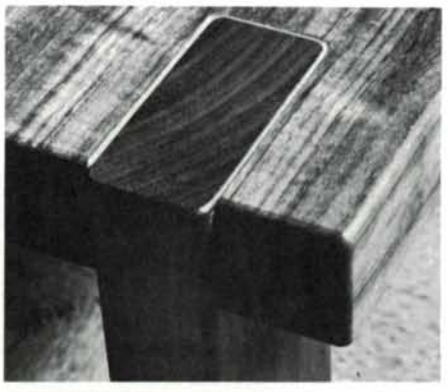
'One sees a lot of this kind of joint in Japan,' Peters says about this bench. 'There they bring half-round sections together in house framing. Visually it is a very simple joint, but in fact it's quite tricky to achieve. We do use a template, but the tenons still have to be scribed and fitted by hand. We take a bit off and try again.' Detail photos: © Robson 1980.

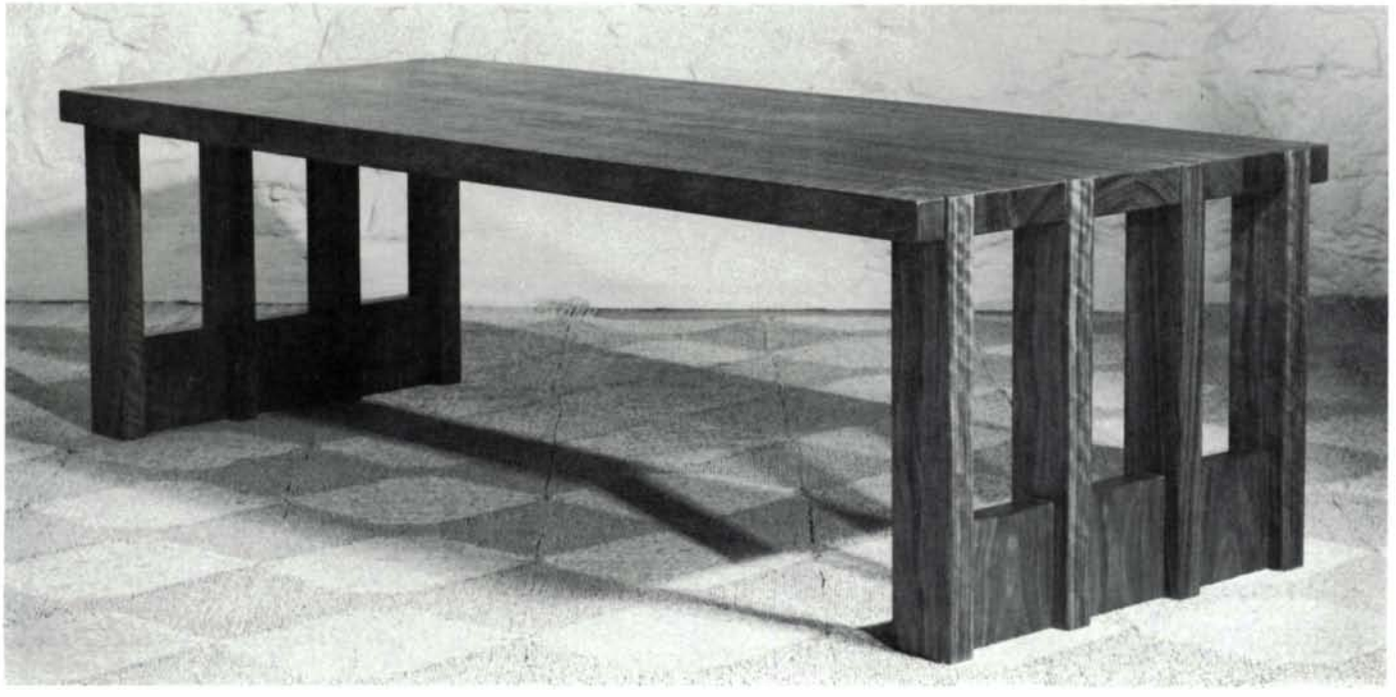
Above, small writing desk in the Chinese Gothic idiom is constructed with a mixture of solid wood and veneers. Peters felt it was risky to make the arches out of solid wood because there would have been 9 in. of grain to move. The hinged flap also is veneer construction. Says Peters, 'I know the weakness of veneers and try to have a good solid lipping wherever I can.' Photo: Council for Small Industries in Rural Areas. At right, lumber cut roughly to shape for future projects is stacked in the upper part of Peters' shop. The heat is kept on all winter. 'In effect,' says Peters, 'we do our own kiln drying.' Photo: © Robson 1980.



Ash chair, above, is one of 50 for the Swiss Catholic Mission in London. The chairs were kept small to provide maximum flexibility in seating arrangement. Peters considers this fan table, right, one of the most difficult things he has designed and made. The final result, quite different from the original concept, was influenced both by Japanese fans and by David Pye's boxes with fluted lids. The segments of the top were edge-joined after being coved out on the spindle shaper. The complex gluing jig was part clamp, part press.

Peters considers the hall table in Macassar ebony and sycamore, left, to be his most Oriental design. So as not to conceal the base and to give the top a floating appearance, the amount of overhang has been minimized. Low table shown below is a later development of Peters' Chinese Gothic. The arches have disappeared and the verticals are brought up through the top as decoration (detail, right). The grain direction lets the table respond to seasonal changes without conflict. Low table and detail photos: © Robson 1980.





to a chunkier version (facing page, bottom), doing away with the curves and bringing the posts up through the top as a decorative feature.

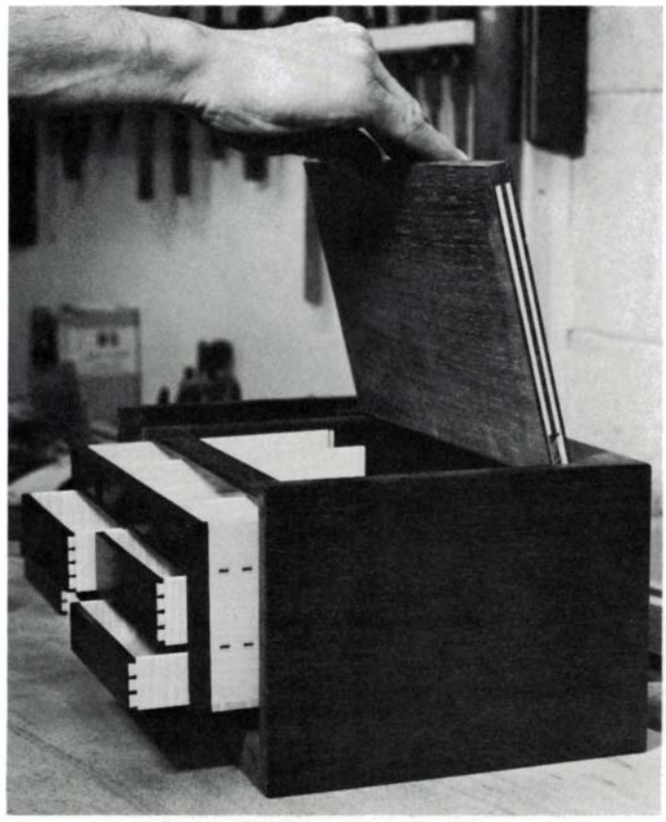
Peters' most recent work in this vein is the hall table in Macassar ebony and sycamore (facing page, center left). It is closely related to the Chinese tradition of making solid wood look like bamboo. "It was designed for a local farmer's wife to go on her lovely Chinese rug and is a bit shorter than I wanted. I especially like the top floating on the two rollers and the exposed underframe." This piece has ended up in Peters' living room because the client didn't like it.

The little chapel chair (facing page, top left), shows Peters' exceptional flexibility as a designer: "I very much design for the situation," he says, "and it seems to me a bit arrogant to force the same style on everyone. This was a very low-budget job but I rather enjoy the challenge of doing things inexpensively and doing them well." The seats were shaped by accurately ripping strips of wood about 2½ in. wide on a tilting-arbor saw, then they were joined with blind splines in stopped grooves to get the shape. Peters didn't try to match the grain of the strips because he wanted them to be a strongly visual part of the chair's overall appearance.

The fan table (facing page, top right) is a recent design; because of its fluted top, it's more decorative than functional. Technically it is one of the hardest things Peters has attempted, and he also admits to having had problems with the base. "I was sweating over it for weeks. We made mock-ups, changed mock-ups, and couldn't get it right." The original design had called for a frame and round legs, but Peters soon realized that the scalloped edge was part of the beauty of the piece. He then designed a base to look like leaves in a book to echo the radiating lines of the top. This seemed too heavy and dark for the delicate top so he experimented with various cut-outs to lighten the leaves and finally arrived at a solution that pleased him.

Peters still works from drawings but also uses models—especially for his more sculptural pieces, because it's easier for him to visualize what a piece will look like when working from a full-size mock-up than from scale drawings. He says he can sometimes spend a day playing around with the design in softwood and work out many of the details like the size and shape of each piece. Then, by making templates, he avoids wasting valuable timber.

Peters usually has one four-year apprentice and one or more employees who stay for a year or two and then move on. There is a great demand in England for the traditional training that Peters' shop offers, and his current apprentice, Keith Newton, was chosen from 50 applicants. Employees are expected to do complete jobs with minimum supervision but an apprentice is gradually introduced to new techniques, one step at a time. Kevin Harris, a former apprentice, says, "Alan likes to have people that can get on with a job, do it fast and don't mess around. He impresses you from the start that if you don't do it right, you'll do it again and again until you do get it right. It's the only way to learn."



Peters made this small jewelry box so an inner box can be removed completely from the outer case to become a piece in its own right. 'There's a lot of work in this—I played around with it for eight months.' Photo: © Robson 1980.

Peter Kuh, an American employed by Peters for two years, recalls, "My first job was a dining table in solid Indian laurel. Alan gave me the wood and detailed drawings, and told me to get on with it. Two weeks later he left for Japan. I was very tense and felt I was overreaching myself. I took a great deal of time but did manage to complete it, and Alan was satisfied." I asked Kuh what happens when someone makes a mistake. "It has to be corrected," he replied. "There is no alternative. Alan simply will not let work out of the shop that is not up to his standards." Kuh's second assignment was a bowfront sideboard. When he assembled the drawers, there were gaps in the dovetails. Kuh suggested filling them, but Peters said no. So he sawed off the sides and made new ones. These too were imperfect. On the third try he got it right. "Alan pushes himself to the limit," says Kuh, "and you have to come up to his standards." Kuh now has his own shop in Devon, and I asked him how he felt about the experience in retrospect. "Painful though it sometimes was, I could not have got better training anywhere else. I learned to work to Alan's standards, and now I try to apply those standards to my own work." Peters also pushes for efficiency, and according to Kuh, Peters considers a craftsman good when he not only does quality work but does it quickly as well.

Edward Barnsley is fortunate in having himself trained men who have stayed on in his shop for a lifetime. But things are different now. Just as Peters broke away to pursue his own career, so his apprentices do the same, setting up their own shops or taking their skills to other employers. Peters is an exacting man to work for, sometimes moody and anxious and always very much the boss. Everyone I spoke to who has been through his shop admires his ability as a designer and his uncompromising workmanship. Perhaps, much like Barnsley, his contribution will be judged as much by the craftsmen he has trained as by the furniture he has designed and made. □

Alan Peters will visit the U.S. this summer to conduct a design workshop July 13-17. For information, write Dale Nish, 230 SNLB, Brigham Young University, Provo, Utah 84602.

The Basics of the Bandsaw

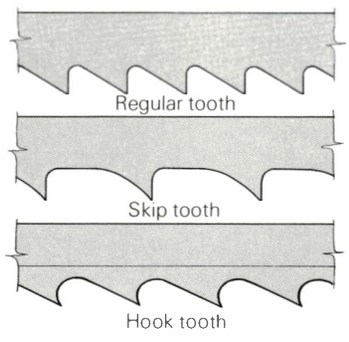
Setting up and using this versatile machine

by Tage Frid

The bandsaw is one of the most versatile machines in the shop. It can cut curves, it can rip, crosscut, resaw, and it can cut joints. It can also cut sides of beef with ease, so if you see bits of meat clinging to the wheels in these photographs, it's because that's what I've been doing lately. However, the bandsaw cannot make as smooth a cut as a table saw, because a table saw has a stiffer, thicker blade that stays straighter in the cut. A bandsaw blade must bend around its wheels, so it can also bend in the cut. It is a welded ribbon of steel. Because the two ends are difficult to weld exactly in line and the weld itself produces a raised surface on the blade, the blade pulses, both forward and back and sideways, when moving at high speed. This pulsing makes the cut uneven. Still, because the depth of cut is greater and the blade is narrower, a bandsaw can do things a table saw can't. It's best for cutting curves and for resawing wide stock with minimal waste.

To get the best possible cut on your bandsaw, you first have to choose the right blade and then install it properly. I had a 14-in. bandsaw for many years before getting the 20-in. saw (with a 2-HP motor) I have now. Besides its larger blade-to-column distance (throat) and its greater depth of cut, this larger saw can use a wider blade and run it under greater tension, two important factors in determining how smooth and straight the cut will be. You should always use the widest blade possible for the job. For straight cuts, as in resawing, I use a 1-in. wide blade. For most curve cutting, I use a ⅜-in. wide blade, which will cut to a radius of 1 7/16 in. For tighter curves a narrower blade is necessary; probably three blades (1-in., ⅜-in. and ⅛-in.) will cover most uses.

Another important factor in blade choice is the number and kind of teeth. Bandsaw-blade technology is most developed for metal cutting. There are all sorts of tooth styles and arrangements of tooth set, each one best suited for cutting a particular kind of metal, of a particular thickness, at a particular speed. The choices for wood cutting are not so numerous. For one thing, all wood-cutting bandsaw blades have every tooth set alternately; raker (or unset) teeth do not have an advantage in wood cutting. For a long time wood-cutting bandsaw blades had regular teeth, that is, like a handsaw, they had 0° rake and they were the same size as the gullets between them. This kind of tooth style is fine for cutting in thin stock, but by eliminating every other tooth and increasing the gullet size, chips clear better and the cutting is faster. This is called a skip-tooth blade. With the increased chip clearance, it's possible to put a rake on the teeth, usually 10°, which makes feeding easier, sawing faster. Depending on the manufacturer, this is called a hook-tooth, claw-tooth, saber-tooth or gore-tooth blade, and it's what most people use now.

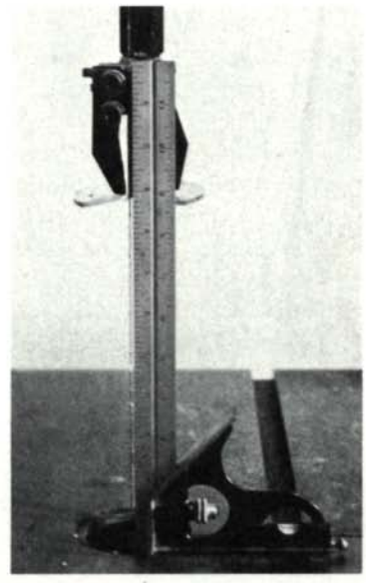


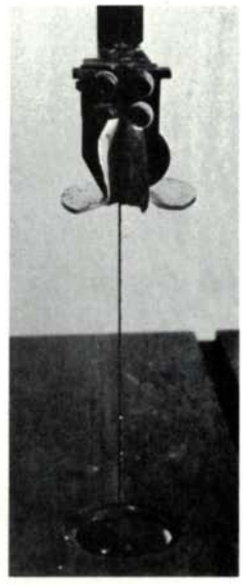
The number of teeth per inch is also important for getting the best cut. The thicker the stock, the fewer teeth per inch you should use. Two or three teeth per inch is considered a coarse blade and is best for resawing. Ten or more teeth per inch will cut the best in thin stock. Most of my blades have around five teeth per inch, good for general work; all are high-carbon steel with hardened teeth and flexible backs.

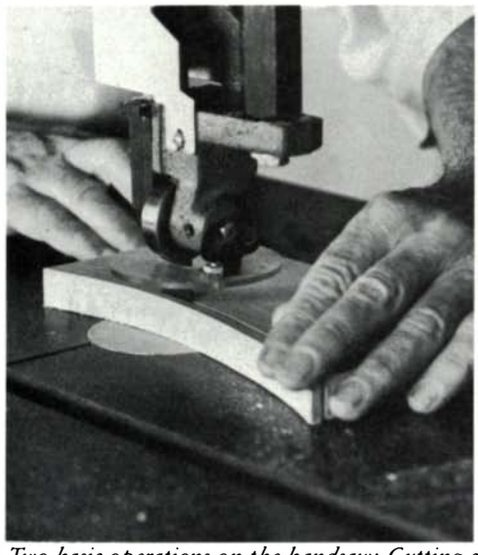
Installing the blade—Some people spend a lot of time installing a blade, going back and forth over the adjustments, really making it more trouble than it has to be. The trick is in doing things in the right order. First unplug the saw, loosen the tension on the upper wheel and back off all the blade guides; this way you can slip the blade easily around the wheels (make sure the teeth are going in the right direction) and concentrate on tensioning and tracking without the guides getting in the way. Tension the blade by turning the tensioning knob that spreads the two bandsaw wheels apart. Most bandsaws have a tensioning gauge that shows the proper tension for each blade width (the wider the blade, the greater the tension). If your saw doesn't have a tensioning gauge, you'll have to develop a feel; some people pluck the blade like a guitar string and seem to know by the sound when the tension is right. Too much tension and the blade can break, too little and it will wander in the cut. When you've tensioned the blade enough to keep it on the wheels, track it. Tracking is done by turning a knob that tilts the axis of the upper wheel, which makes the blade move back and forth on the rubber rim. Rotate the upper wheel with one hand and as the blade coasts, adjust the tracking knob with the other hand until the blade rides in the middle of the rim. Finish tensioning the blade and test-track it again by hand. Now close the doors, plug in the saw, and test at higher speeds by bumping the motor on and off before letting it run continuously. If the blade runs true, you can proceed; if not you have to stop the blade (here's where a foot brake is a time-saver) or let the blade coast to a stop before opening the doors and retracking by hand. Never track the blade or open the door with the blade running at high speed. If the blade slips off or breaks, you want those doors between you and it.

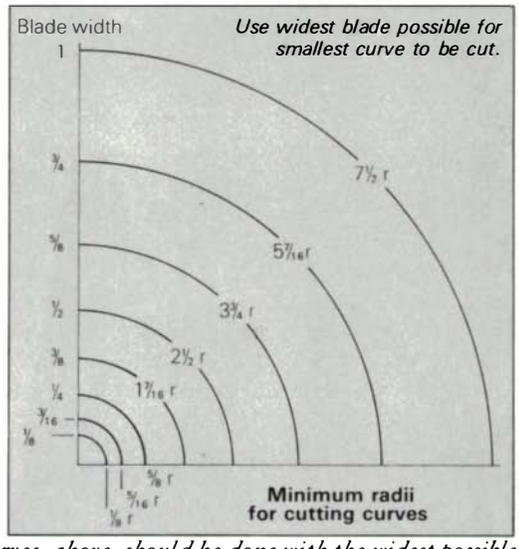
With the blade tensioned and tracked, square the table to the blade; then you can adjust the blade guides. Bandsaws have two sets of blade guides, one below the table and one above. The top set adjusts up and down for different depths of cut. Each set of blade guides consists of a rear thrust bearing and two side supports, which may be ball bearings, hardened-steel blocks or pivoting plates. Ball bearings are best because then can be brought right up in touch with the blade, but they are expensive and clog easily with sawdust. Blocks and plates have to have some clearance, and blocks

Installing a new blade on the bandsaw is easier if you do things in the right order. With all the blade guides backed off, the blade is slipped around the wheels and tensioned. Next the blade is tracked, left, by turning the upper wheel of the bandsaw with one hand while adjusting the tilt of the wheel's axis with the other. Never track the blade with the motor running and the door open. Next adjust the blade guides, first the thrust bearings, upper and lower, then the left-hand side guides. Use a square, right, to make sure you're not pushing the blade out of line, and a piece of paper between the blade guide and the blade for clearance. Then use the same piece of paper, far right, to set the right-hand side guide with the proper clearance.









Two basic operations on the bandsaw: Cutting curves, above, should be done with the widest possible blade for the curve; the chart gives the limits of various blade widths. Using too wide a blade will result in heat and stress on the blade as its back rubs in the kerf; this can break or damage the blade. When sawing curves, be sure to keep your hands behind or to the sides of the blade. Resawing, right, is done with the widest blade the saw will handle and an L-shaped fence at the blade. The fence is rounded over where it rides against the planed surface of the board. This way the board can be fed on an angle to compensate for the tendency of most bandsaw blades to lead to one side or the other.

tend to wear at the front and to lose their setting from vibration. I'm happy with the plate side guides that came with my saw because once the plates are mounted, the support from the teeth to the back of the blade is fixed and their sideways position locks down good and tight.

The thrust bearings should be adjusted first. It doesn't matter if you do the upper or lower one first, but both should be set before adjusting any of the side guides. Bring the bearing up so it just touches the back of the blade. As mentioned earlier, a running bandsaw blade tends to pulse, so you'll have to check the adjustment as you turn the wheel by hand. As it runs, the back of the blade should just kiss the thrust bearing. Too close and it can wear the surface of the bearing; too far away and the blade will wander in the cut.

Set the upper and lower left-hand guides next, rather than both upper or both lower. I use a piece of paper (the thickness of a brown grocery bag) between the guide and the blade to gauge the clearance; with ball-bearing guides clearance is not necessary. It's important here that you use a square on the table to make sure you're not bending the blade to the right with too much pressure from the guides. Besides proper sideways adjustment, you also have to set the guide properly in relation to the front of the blade. It should be just flush with the back of the gullets—too far forward and teeth will wear the guide; too far back and the guide won't provide adequate support. With both left-hand guides set, adjust the two right-hand guides, again using the piece of paper for clearance. Test the way the blade moves through the guides, turning by hand before switching on the machine. Be sure that the weld moves freely through the groove.

Basic bandsaw technique—Probably what you'll be doing most on the bandsaw is cutting curves. The important thing here is to keep your fingers to the side of the blade or behind it—never in front. And, of course, as with all bandsaw cuts, be sure to lower the blade guard to within ½ in. of the top of the stock you're cutting. This guides the blade better and lessens the risk of injury. The most common mistake most people make on the bandsaw is to cut a thick piece and then cut a thinner one without sliding down the guard. While

leaning over, concentrating on the line you're cutting, not only are you liable to stick your head into the moving blade, but if the blade breaks, pieces can fly all over like shrapnel. Never use a blade too wide for the radius you are cutting. The stress of the back edge rubbing in the kerf can break the blade. Getting a smooth cut is a matter of evenly feeding and turning the work. Stopping in the middle of a cut can produce an uneven surface, as the blade's vibration widens the kerf. Plan your moves. If a shape will require tight curves or cutting in and backing out the blade, make relatively straight cuts in the waste to remove most of it; then you can concentrate on the contour line without the blade binding. Never force the work into the blade. If the blade doesn't want to follow the line you're cutting, head for the waste side and come back for a closer second cut.

The bandsaw is excellent for cutting circles. A jig similar to the one I use appears in the Methods column, *FWW* #6, Spring '77. This jig can also cut arcs of a circle, particularly useful when making forms for curved laminations (photos, facing page, top). The curved ribs of these forms must be identical; because of the bandsaw's depth of cut, you can stack and cut them all at once, thus ensuring uniformity.

The bandsaw is also most useful for resawing wide boards. Sometimes I will take a wide board and kerf it along either edge on the table saw, raising the blade between passes, before bringing it over to the bandsaw to complete the cut. Bandsawing thus goes faster and it's easy to keep the thin bandsaw blade in the wider table-saw kerf. But when I have a minimum of material to waste, as is often the case with figured wood I am bookmatching, I will resaw it on the bandsaw alone (last photo, previous page). I use a plywood L-shaped guide at the teeth of the blade, its vertical edge

Straight-line cutting and the bandsaw touch

by Arthur Reed

Although most shops reserve the bandsaw for curves, it's unequalled for cutting straight lines. We have two bandsaws in our shop, a 10¼-in. Inca and a 36-in. American, and together they do most of our sawing. We rip rough stock in thicknesses up to the blade-guide capacity, we resaw for veneer and for matched panels, and we size stock for furniture and cabinets. We even rely on the bandsaw for joinery.

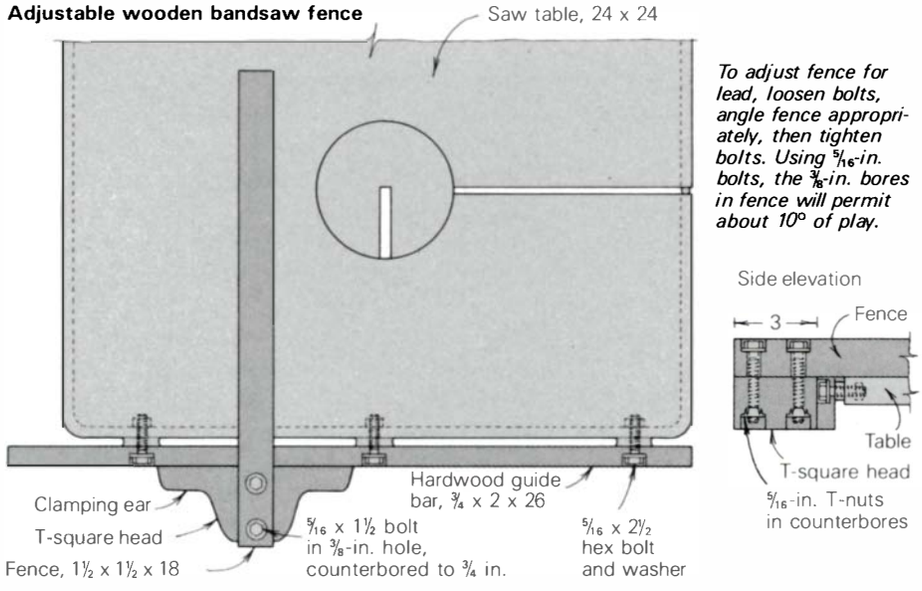
Many woodworkers harbor prejudice against the bandsaw, probably from the frustration of having tried to saw a straight line without being familiar with the balance of forces that allows the machine to work. Perhaps more than any other machine, the bandsaw requires a delicate, learned touch.

One key to success is accurate and careful setting of the guides, so the blade can travel freely through the stock and yet be supported in its travel. Similar coordination is required between blade and rip fence. Bandsaw teeth form a narrow corridor in the stock, a corridor that must pass around the body of the blade without contacting it. Otherwise, the side pressure will twist the blade and make it cut unevenly. Thus the characteristic cutting path of the blade must be determined, and the rip fence must be aligned with it. Since this path is rarely parallel to the sides of the table, we assess the drift of our blades regularly.

True up one face and edge of a piece of 2x4 stock about a foot long. Mark a pencil line on the face opposite the trued face, parallel to and about 2 in. from the trued edge. Slowly feed the stock, trued face down, into the blade with moderate force and feel for the drift by moving the cut away from and back onto the line. After about 8 in. of feed, you'll find the angle that keeps the saw cutting easily along the line. Turn off the saw, bring up the rip fence and adjust it to hold that angle. The Inca fence allows this adjustment; if yours doesn't, either mark the line on the table and clamp a board fence parallel to it, or make yourself an adjustable fence as shown in the drawing. Finally, take another piece of scrap and rip it along the fence. If the scrap seems either to pull away from the fence or to bind the blade, re-adjust. Otherwise, once set, the drift angle should be constant for the life of the blade, regardless of grain structure, hardness, softness or thickness of the stock cut.

It's also important to develop a technique for feeding the stock into the bandsaw. This determines to a great extent the quality of the cut. Feed should be constant and smooth, though the amount of pressure and sometimes its direction vary; they constitute the "touch," the operator's sense of how the cutting is going. On thicker, harder stock, be aware of the greater work the bandsaw teeth have to do, and feed at a rate the blade can handle. It takes time to develop the correct touch, to learn to back off when certain sounds are heard or when a familiar feeling is replaced by something not quite right. Developing touch is a matter of making mistakes and learning from them. □

Adjustable wooden bandsaw fence



To adjust fence for lead, loosen bolts, angle fence appropriately, then tighten bolts. Using 5/16-in. bolts, the ⅜-in. bores in fence will permit about 10° of play.

Arthur Reed operates a custom woodworking shop in Elmira, N.Y.

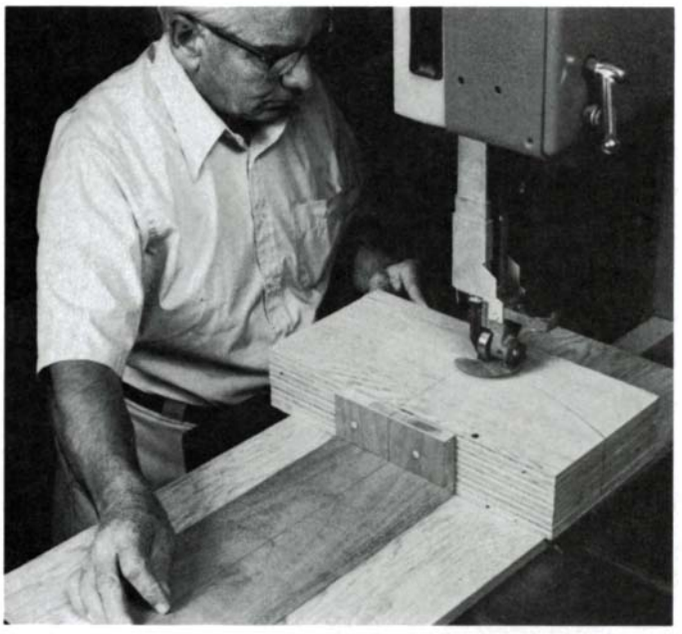
rounded over, and follow by eye a scribed line. Because of variations in set or sharpness, sometimes through wear, sometimes on new blades, most bandsaw blades will lead to one side or the other. With this L-shaped guide you can shift the angle of feed to follow the lead of the blade. (One of my former students claims proficiency in using no guide at all; he prefers to resaw freehand and thus eliminates the possibility that blade-lead will bind the stock against the fence.)

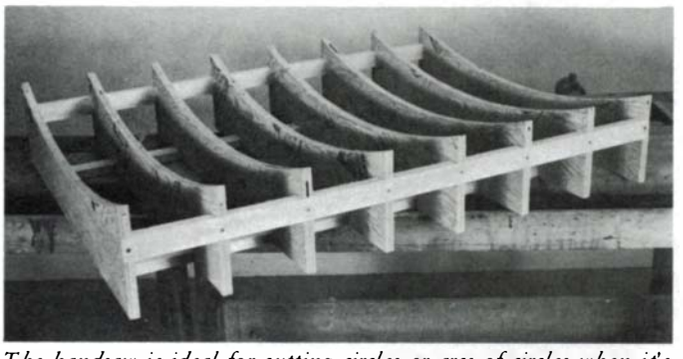
To resaw with the L-shaped guide, first plane one face and joint one edge of the board. Draw a line on the unjointed edge, parallel to the planed face, and saw with the planed face against the guide and the jointed edge on the table. Push evenly and slowly; don't crowd the blade; let it cut. Keep the feed constant, and keep your hands away from the blade, especially toward the end of the cut; use a push-stick or reach around the blade and pull the board through. Whatever you do, don't push those last couple of inches through with your thumb on the end of the board.

Resawing satisfactorily requires using as wide a blade as possible with two or three teeth per inch for adequate chip clearance. A 1-HP motor is the minimum; 2-HP to 3-HP is best for green wood. Make sure your blade is sharp and properly tensioned, and that the blade guides are adjusted and close to the work. If the cut bellies, it's probably because of inadequate chip clearance. Slow down your feed and/or use a blade with fewer teeth per inch. If you are getting deep striations on the sawn surface, it means one or more of the teeth on that side of the blade are damaged or set wrong. Try holding a carborundum stone flat against that side of the blade while it's running. Keep in mind that even when you get a smooth, flat surface from the saw, there is a good chance the board will cup because moisture content is rarely consistent throughout a board, and resawing exposes new surfaces to the air. You must allow for this and saw your stock thicker than you need. It is also a good idea to put resawn boards aside for a few days before finish-planing and jointing, so they will reach equilibrium with the shop atmosphere. How much stock can you expect to lose in resawing? There's the waste to the kerf, the waste to the jointer (when resawing a number of thin boards from one thick one, it's best to joint the sawn surface of the thick stock after each sawing) and the waste to cupping—figure on losing at least ¼ in. for each sawing.

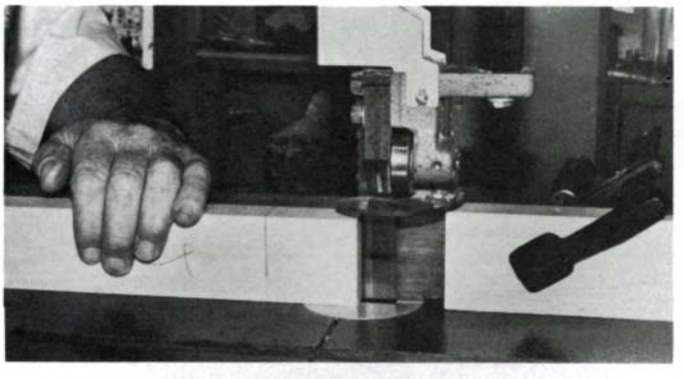
Bandsaw joinery—There are several joints it makes sense to cut on the bandsaw, especially if there are a large number of them to do. Through dovetails can be cut almost completely on the bandsaw, tilting the table to saw the pins and freehanding the tails after marking them from the pins. Some joints can be done on the bandsaw in conjunction with the table saw. In cutting tenons or lap joints, for instance, the bandsaw can waste the cheeks after the table saw has cut good, clean shoulders. I prefer to make the two cuts on the table saw, but if you don't have a table saw, both shoulders and cheeks can be cut on the bandsaw, as shown in the photos at right.

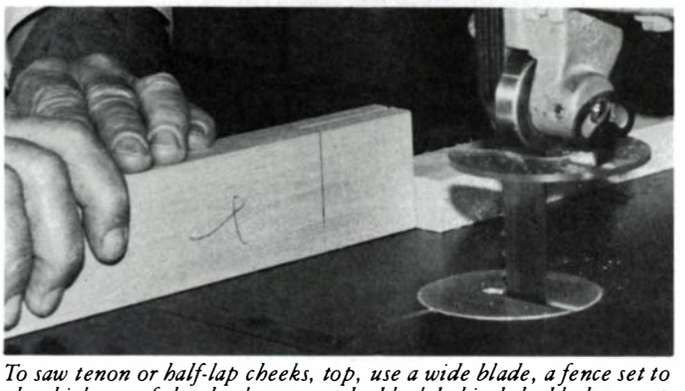
To saw cheeks on the bandsaw, first mark on the stock the lines for both cheeks and shoulders. Install the widest blade possible and set up a rip fence a distance from the blade equal to the thickness of the cheek waste. Because this is a relatively short cut, it usually isn't necessary to angle the fence to compensate for blade drift (lead). You can set up the fence parallel to the table edge. Next clamp a stop to the fence that will keep the stock from traveling farther into the blade than to





The bandsaw is ideal for cutting circles or arcs of circles when it's equipped with a plywood plate and pivoting trammel to which the stock is pinned. Top, plywood ribs are being cut to identical arcs for use in a bent-lamination form, above.





To saw tenon or half-lap cheeks, top, use a wide blade, a fence set to the thickness of the cheek waste and a block behind the blade to stop travel at the shoulder line. To saw the shoulder, above, use the miter gauge; clamp a block to the table for quick and accurate positioning of repetitive cuts.

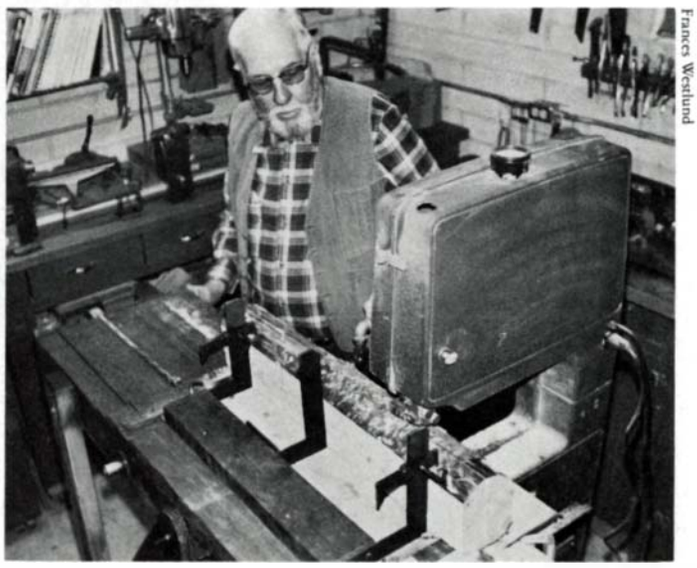
Photos: Roger Birn

the line of the shoulder. Hold the stock firmly against the fence and feed it into the blade up to the stop. Saw the cheeks for one side of all the stock you are joining. Don't flip the stock; reset the blade-to-fence distance before cutting the other cheeks to make sure variations in stock thickness do not produce variations in tenon thickness.

If you are also sawing the shoulders on the bandsaw, remove the fence and use the miter gauge. Place one of the pieces of stock against the miter gauge, positioning it so that the blade is in line with the shoulder to be cut. Without moving the stock on the miter-gauge fence, pull the stock and miter gauge back to the front of the table and mark the table where the stock ends. Clamp a stop block to the table at this mark, and you can use it for quick and accurate positioning of each piece to be cut. I don't find it necessary to put a stop block behind the blade to control the depth of the shoulder cut; with the cheeks already sawn it's a simple matter to stop feeding when the waste falls off. □

A bandsaw sawmill

by Lawrence Westlund

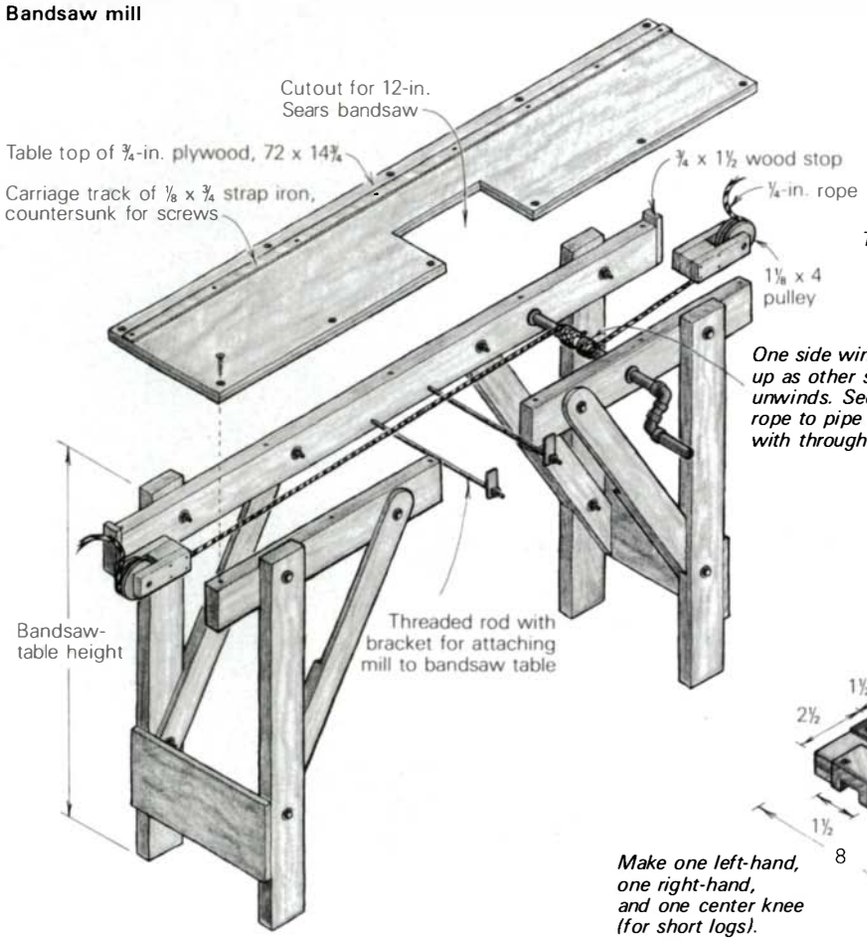


Frances Westlund

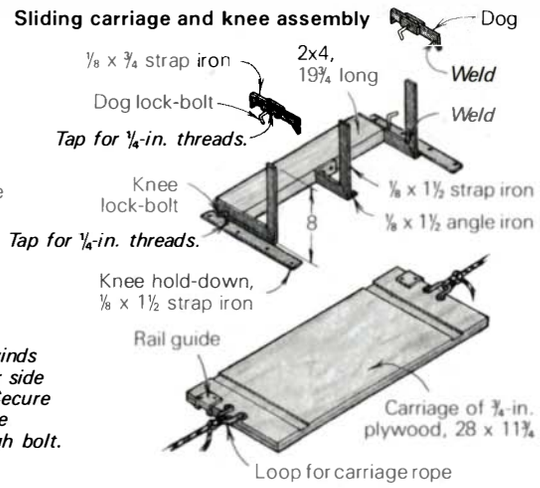
I have a 12-in Sears bandsaw and lots of large branches and small tree butts wanting to be sawn into small boards for boxes and the like. I built a free-standing table with a cutout into which my bandsaw table can be positioned and on which slides a carriage, complete with knees and dogs for holding round wood while the carriage is cranked past the blade. The mill for my saw, shown in the photo and drawing, can handle 7-in. diameter logs; dimensions, of course, can be varied for other saws. Most of the work is bolting the stock together to form the table. I did weld the iron for the knees and dogs, though these could be bolted as well. □

Lawrence Westlund is an amateur woodworker in Klamath Falls, Ore.

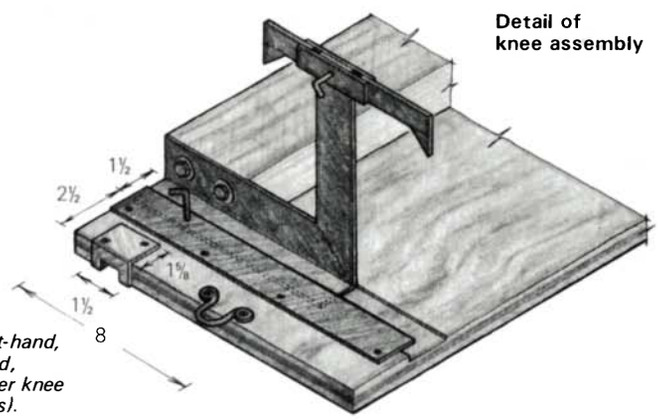
Bandsaw mill



Sliding carriage and knee assembly



Detail of knee assembly



Make one left-hand, one right-hand, and one center knee (for short logs).

The State of the Forests

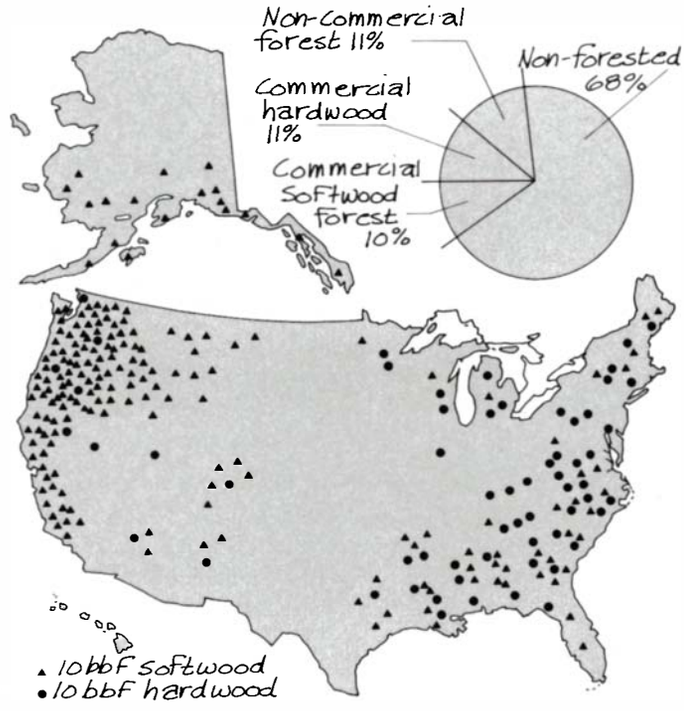
Where our wood comes from and where it's going

by Eugene Wengert

An understanding of the prospects for this country's hardwood use must begin with an inventory of its sawtimber. The United States has approximately 75% as much forest land today as when Columbus landed. This amounts to 737 million acres, or about one-third of the country's land area. Of this, about 255 million acres are used for parks, wilderness and recreation areas, or are unsuitable for growing commercial timber. On these non-commercial areas, equal to the combined land area of California, Oregon, Washington and most of Idaho, timber harvesting and in some cases even timber management is prohibited.

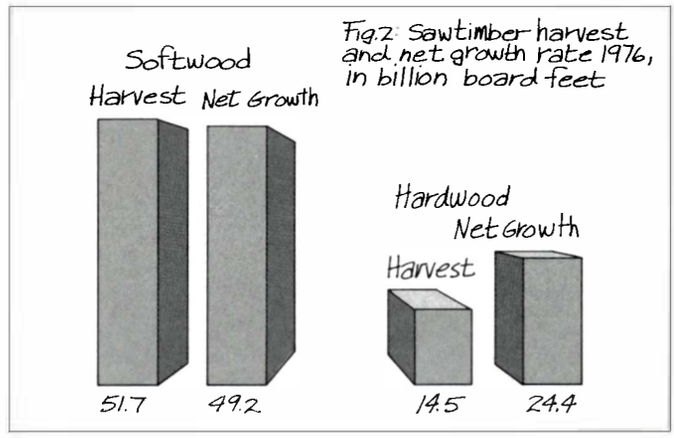
The remaining 482 million acres are our commercial forest land. This does not mean all the wood on it is available for commercial harvest; it means this land is capable of growing wood at the rate of at least 20 cubic feet per acre per year, and that the land hasn't been legally withdrawn from commercial use. The 482 million acres include golf courses, windbreaks around farm houses as well as slopes too steep to log. Only about half of our commercial forests are in production for timber. In all, they contain 2,569 billion board feet of sawtimber—softwood trees 9 in. in diameter or larger at breast height (dbh), and hardwood trees 11 in. dbh or larger. The geographical distribution is shown in figure 1.

Fig. 1: Distribution of forests and sawtimber (Total land area 2,316 million acres)



Wood use—From our forests comes a wide range of products—paper, lumber, boards, chemicals, fuel etc. In 1977, the total U.S. consumption of wood products, including 10% that was imported, was 13.2 billion cu. ft., several billion cubic feet more than in the 1960s. Most of the growth has been in softwoods, and we're now cutting more softwood sawtimber than is growing to replace it (figure 2). Hardwood consumption has remained fairly constant since the late 1950s.

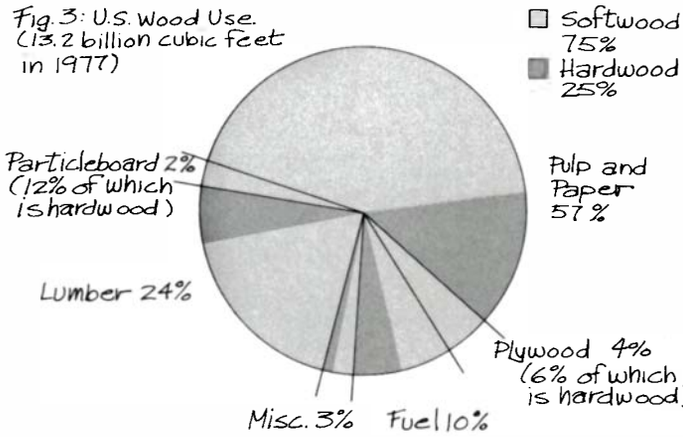
Fig. 2: Sawtimber harvest and net growth rate 1976, in billion board feet



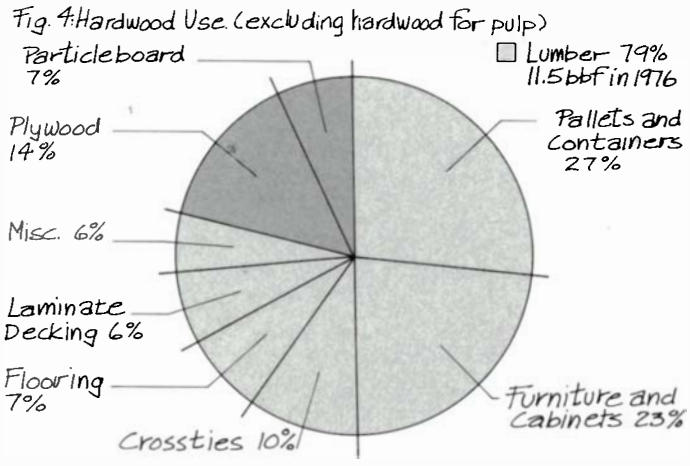
For convenience, wood use (both softwoods and hardwoods) can be divided into six product classes, as shown in figure 3. The raw material requirements of these products would seem not to be in conflict. Pulp and paper uses logging and mill residues for almost half of its material needs. The remainder can be logs of small diameter or logs otherwise unsuitable for sawmilling. Softwoods are preferred, as they make stronger paper. In the lumber category, profitable sawmilling of hardwoods requires straight logs 10 in. in diameter or larger; many softwood mills can profitably saw smaller logs. Wood fuel is primarily residue-based and does not require the larger logs suitable for sawing. Plywood demand is almost all softwood; logs should be straight and greater than 15 in. in diameter. Particleboard is residue-based, except waferboard, in order to keep the cost competitive with plywood and lumber alternatives. Most miscellaneous uses have special requirements; utility poles, for instance, must be 30 ft. long and at least 6 in. in diameter.

In reality, when figuring the impact of these various demands on the raw material supply, the overriding considera-

Fig. 3: U.S. Wood Use. (13.2 billion cubic feet in 1977)



Drawings: Claudia W. Underhill



tion is the capital investment in the manufacturing facility. A multi-million dollar pulp, plywood or particleboard plant cannot afford to shut down for lack of raw materials. A small sawmill (and 90% of them are small) cannot compete, so timber that is best suited for lumber may, when supplies are short, get eaten in making other products.

Figure 4 shows how we use our hardwoods. (Exports, about 100 million bd. ft., much of it high-quality veneer logs, are not included). The largest portion goes to pallets and containers—almost 300 million wooden pallets, averaging 25 bd. ft. of lumber each, are made per year. Laminate decking, furniture and face and back veneers for plywood demand the best logs. However, because only about one-fourth of the lumber sawn from a good log is No. 1 Common and better, it is important that economic uses exist for smaller saw logs. Pallets and cross-ties are such products. With these two products potentially using three-fourths of the lumber from a log, it is common that a mill's entire production goes to them, with no sorting for the higher grades of lumber. Even high-yield logs are often sawn for low-value products, because it may be uneconomical for sawmill owners to do otherwise. The furniture and cabinet industries can try to combat this practice by paying more for high-grade lumber, or by learning to use low-grade lumber.

Future wood use—The amount of wood used in the U.S. will continue to increase during the next several decades with a doubling occurring before the year 2030. Much of the increase in supplies will come from hardwoods, as we are now cutting softwoods at a rate greater than their growth rate. U.S. Forest Service projections indicate a doubling of hardwood usage before 2010.

In addition to cutting more trees, improved use of the tree will provide more fiber. Presently, approximately one-half of the tree is left in the woods—some of that material could be sawn, some chipped and some used for fuel. Additionally, of the one-half of the tree that does go to the sawmill today, only one-half is converted to dry lumber (figure 5). Improved efficiency in milling will increase supplies. The same benefit is possible in the secondary processing plant when lumber is converted to cabinets or furniture.

With the many advantages of wood over other products (low energy to produce, environmentally clean, etc.), the future will bring increased demand for lumber, plywood and particleboard. Wood will be too valuable to burn at locations very far from the production sites, so wood-fuel use will decrease in total percentage. Likewise, the use of wood for pulp will show a slight percentage decrease in overall usage.

The big unknown in the future of wood is the potential for using wood for chemicals. Already, laboratory research has made animal feed, urethane-based chemicals, adhesives, gasoline and much more. When this breakdown of wood can be done economically, a tremendous new market will develop.

Regarding hardwoods specifically, increased mechanization in material handling promises increasing needs for wooden pallets and containers. The growth of this industry is tremendous, having doubled in less than 10 years. The production of furniture, cabinets and millwork will grow as the population matures and disposable income increases. The railroad beds in the U.S. are in need of extensive repair, so the demand for cross-ties is expected to increase. As the preferred species for both pallets and cross-ties is oak, there will be increasing pressure on furniture oak supplies, and it is likely that other species will be used more in furniture.

One unknown in predicting hardwood demand is the use of yellow poplar for construction lumber, which the U.S. Forest Service and others are seeking to develop. To be competitive with the pine 2x4, yellow-poplar construction lumber will be relatively inexpensive compared to furniture stock.

Robert Phelps, a chief economist in the U.S. Forest Service, sees a continuing loss of quality in our hardwood log supplies and, therefore, a decrease in the yield of higher grades of lumber per log. Although supplies of hardwoods seem plentiful, unless the forests are well managed, their quality will not be as high as possible. As improved management now will not benefit lumber production for at least two decades, the furniture and cabinet industries must, in the interim, learn to use a lower average grade of lumber.

Hardwood ownership—Who owns our hardwood timberlands is one of the critical considerations for the lumber producer because the owner determines whether the timber is available for harvest and to some degree the quality and growth of the timber. About three-fourths of the commercial hardwood forest land in the United States is classed as nonindustrial, private forest (NIPF), mainly in the eastern United States. Neither the wood-using industry nor government agencies control enough good hardwood acreage to have a large impact on future timber supplies. Therefore, in considering the present and the future of timber supply, it is necessary to look at the NIPF owners, four million of them.

The primary concern for a large (although unknown) number of NIPF owners is not the production of trees for harvest. They consider wildlife, recreation and other objectives to be more important, even though harvesting can be one of the most useful ways to realize other land-management objectives or benefits. They consider (erroneously, most of the time) that timber harvesting cannot complement these other objec-

tives. In one survey in the East, 41% of the NIPF owners were consistenly against harvest. In addition, the NIPF owner usually does not manage the forest for optimum or even good timber growth, thinning out diseased or poorly formed trees, for example. As a result, much of the NIPF is producing wood volumes and quality below the land's capacity.

Why is this picture so bleak? If there is one common reason, it is that managing land for timber is uneconomical. Thinning and other management is expensive, especially as most NIPFs are in small acreages. Taxes, including capital gains, are high. Hardwood timber returns are often not realized for 75 years. And hardwood stumpage prices are low. To add to the unattractiveness of this situation, the NIPF owner is being underpriced by the federal government: 40% of the timber sold off federal land on the board-foot basis (excluding pulp) has been priced below $80/mbf. More than 21% is sold at below-cost prices. The NIPF owner must pay for forest management, cost of roads, sale preparation, reforestation, and then taxes to support his competitor.

To ensure our future hardwood supplies, we had better be interested in the private-forest landowner and his problems; poor incentives to produce timber for harvest and poor knowledge of the benefits (economic, ecological, scenic and so on) of good management practices should be every hardwood user's concern. (For more, see *Timber Supply—Issues and Options* (Publ. No. P-79-24, Forest Products Research Society, 2801 Marshall Ct., Madison, Wis. 53705.)

Future hardwood ownership—The 1980 ownership pattern of private (75%), public (13%), and industry (12%) will change very little over the next decades. The most significant changes will be as follows:

—Increasing withdrawal of hardwood forests on public lands from commercial timber harvesting into wilderness and other "reserved" lands and resultant increased importance of NIPF.

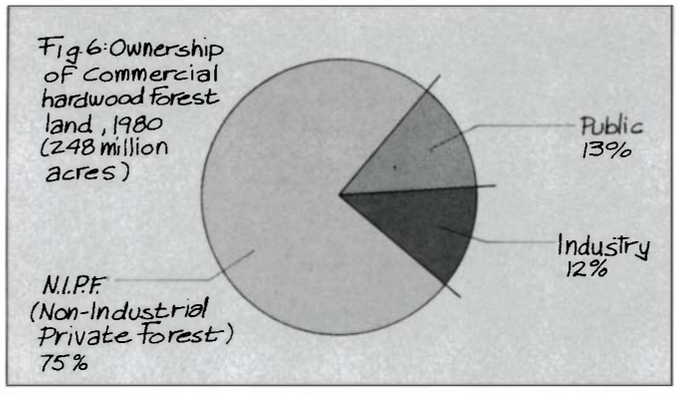
—Increased incentives and benefits for better forest management on NIPF.

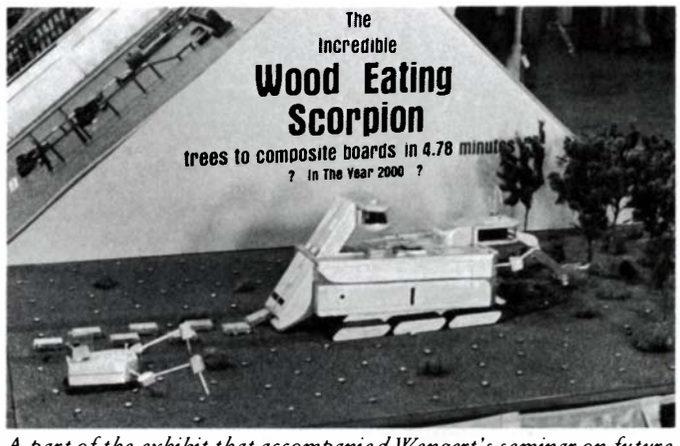
—Increased economic advantages (decreased capital-gains tax) in selling timber on NIPF.

—Increased dependence of the hardwood lumber users on the NIPF for their raw material.

Federal leadership should make reforestation of hardwood sites more attractive, ensuring wood supplies far into the 21st century. Improvements in harvesting will also make the economy of small-tract harvesting more attractive, as necessary to provide the quality and quantity of wood required for our growing needs.

Harvesting—There are many different techniques used to harvest our hardwood forests, from horse logging to helicopter logging, from very selective cutting to clear cutting, and from wasteful cutting to very wise cutting. The basic harvest procedures are determined by economics. Usually, it's more feasible to remove all the mature, salable trees at one time in a small patch than to cut only a few trees every several years. This patch cutting usually aids in reforestation. (In past years we have removed only the good trees in our hardwood forests, leaving the poorer trees to mature and produce seeds for genetically inferior trees in the future.) Also, it is common today that only the merchantable part of a tree (beginning at the decay-free butt and moving upwards in 4-ft. increments until just before a 6-in. diameter is reached) is removed from the woods and taken to the mill—about one-half of the tree is left in the woods (figure 5).





A part of the exhibit that accompanied Wengert's seminar on future hardwood use, this partly science-fiction monster incorporates extant technology in one unit to produce dry, defect-free, dimensioned composite boards from whole trees cut and swallowed at the front end. The smaller unit at left is busily replanting.

Present logging practices are, from a material standpoint, wasteful. From an economic standpoint, they are acceptable. A recent Forest Service (Princeton, W.Va.) study of a hardwood logging site found almost 70 tons of residue per acre, of which nearly one-quarter was sawable and three-quarters was chippable. If these residues can be used for fuel, pallets and particleboard (and maybe even furniture parts), this certainly will help the hardwood-supply picture.

Harvesting in the future will be more mechanized with more of the tree (more fiber) removed from the forest. The grapnel skidder will shear the tree close to the ground and carry it to the landing where large branches may be removed and perhaps some of the tops. These residues will be baled (like a hay bale) and then sold for fuel or other residue use. Merchandizing of the long, tree-length logs will take place at the mill. Clear cutting in small patches will continue. □

Gene Wengert is professor of wood technology at Virginia Tech in Blacksburg, Va. This article is adapted from his contribution to a report, prepared with Mark White and Fred Lamb, that was presented in seminar at the Louisville furniture manufacturer's fair last September. The report, entitled "The Lumber Complex of the Future," goes on to describe present-day sawmilling and lumber-processing techniques as compared with what they will probably be in the year 2000. It will be published in summary form in installments through 1981 in the trade magazine, Furniture Design and Manufacturing *(400 N. Michigan Ave., Chicago, Ill. 60611).*

Two Shows in Santa Fe

David McMullen

Writing desk, 29 in. by 45 in. by 29¼ in., by John Sheriff is constructed entirely from quarter-sawn white oak, except for the tambours, which are teak. The stringers supporting the floating top are through-tenoned into the rails, and the pigeonhole unit is cantilevered over the writing surface. Behind the narrow tambour curtain are several little drawers for pens, pencils and other paraphernalia. With its ingeniously simple geometry and plane surfaces, this piece might grace the captain's cabin in a spaceship.

Generally considered an enclave of Spanish Colonial design, New Mexico has a history rich in craftsmanship inherited from centuries-old Spanish and Moorish aesthetic traditions. But now the state is home to a host of woodworkers who are exploring the full gamut of forms in furniture and sculpture—from high style to rustic, traditional to contemporary. This diversity was amply demonstrated last September at the Armory for the Arts in Santa Fe. The show, called Once a Tree, was largely the achievement of Santa Fe woodcrafter Geoff Gorman; co-sponsors were hardwood suppliers Kitts Enterprises and Paxton's Lumber Co., and the Contemporary Craftsman Gallery and Burk Denman. My guess is that about 10% of the local woodworkers were represented at the show.

Another month-long exhibit was presented earlier at the Contemporary Craftsman Gallery, where owner Jane Gann likes to feature the works of one craftsman at a time. The furniture of John Sheriff, 23, of Albuquerque held the floor during the month of August. A high-school woodworking instructor, Sheriff enjoys being able to experiment with design and construction, as his tambour desk, left, well illustrates. □

James Rannefeld designs and builds furniture in Taos, N. Mex.

Chicken chest by Geoff Gorman is cherry with sliding-dovetail construction (four sides joined to four corner posts). A one-time painter and cartoonist, Gorman incised the dancing chickens into the front panel with a router and cleaned up the cuts with hand tools.

Handmade silver hasp and escutcheon with opal setting adorn this padauk jewelry box by Kirk Bonds. He combined the techniques of stack lamination with traditional joinery to produce this box in a limited edition.

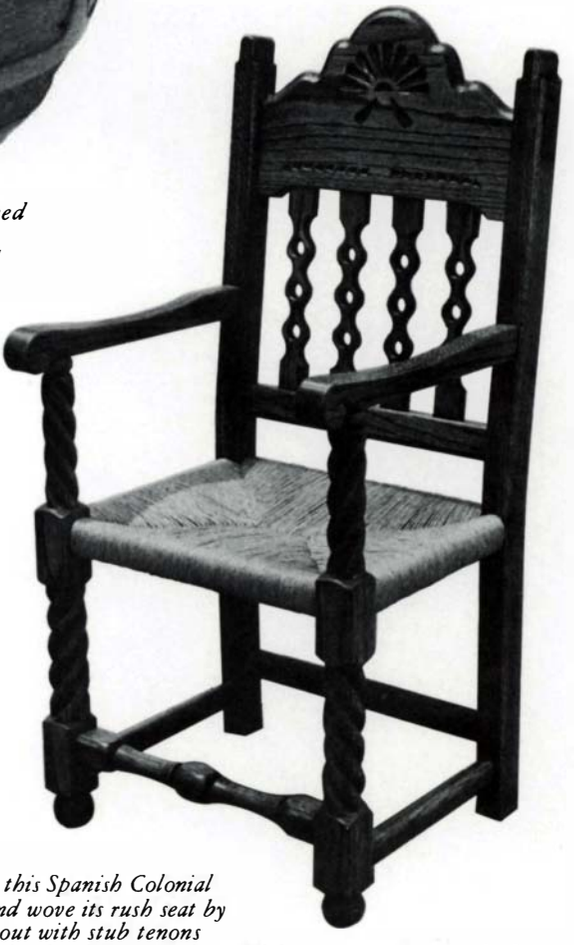
Photos, except where noted: James A. Rannefeld

Ron Grow's oak couch with purpleheart inlay is derived from traditional Spanish Colonial designs. It's joined mostly with mortise and tenon, but the front and back rails are screwed to the uprights. The splats were patterned after Navaho blanket motifs, and the upholstery fabric is by Harry Cordova of Truchas, N. Mex., a third-generation weaver.

Santero (a carver of saintly figures) Leo Salazar fashioned this figure of Moses from native cedar in the traditional way: carving in his lap with simple chisels and knives.

Bowl by Gary Schrodt, turned from honey mesquite and inlaid with mother-of-pearl moon, is based on Oriental pottery forms. Schrodt carved the Southwest landscape using rotary dental tools.

Eastern design, Western joinery mark this chair by Sat Rattan Singh Khalsa. Made of teak and iroko, it has a cowhide seat, and its rails are brought through the posts with wedged tenons. Instead of the traditional keyed scarf joint to connect the arms and back rail, Khalsa used long, open mortise-and-tenon joints.



Robert Dooling made this Spanish Colonial chair out of red oak and wove its rush seat by hand. Joined throughout with stub tenons secured by blind dowels, the chair's spiral-carved front posts were roughed out with a router jig of Dooling's invention, then finished with hand tools. The design was adapted from several originals he keeps on hand.

Inventing Marquetry

I was an oil painter for seven years before I discovered marquetry. Between paintings I would carve wood and work with veneers. Five years ago I hit on what I thought was an original idea: using the natural warmth and beauty of veneers to create pictures. I called this work "wood pictures" because I'd never heard of marquetry. Then I saw in the Spring'76 issue of *Fine Woodworking* that I'd not invented the ancient art of marquetry. A visit to the library enlightened me as to its history and methods. Like myself, the author of the book I read had also first felt he had invented a new art form.

My tools consist of X-acto knives, rigid, single-edge razors and chisels. Most of my pictures I construct by applying one piece at a time to particleboard using a nonlatex contact cement. I start at one end of the picture and work across to the opposite end, making sure each piece blends with and complements the overall picture. Though the artist and paint-mixer still thrive within me, I do not paint or stain any part of my pictures. I do burn in fine lines and details.

I was born and raised on Chicago's South Side, and I'm most interested in both city and country scenes. My pictures come from sketches of images in my mind, though I will use the camera too. Marquetry is more difficult than painting, but I find that being limited to the natural hues and tones of wood is a challenge. —*Jim Davis, Hoffman Estates, Ill.*

Above, 'South Side' displays an avodire sky and a walnut burl Lake Michigan. The steel mills and factories are of rosewood, maple and sycamore. There are more than 300 veneer pieces in this picture, 18 in. by 24 in. In 'Golden-Gate Bridge,' top, 12 in. by 18 in., a vermilion tower looms behind hills of walnut burls, quarters and crotches. The road is rosewood and the cables are burned into the hills and sky. Left, 'Powerhouse,' 12 in. by 24 in., composed from a photo, is mainly sycamore (sky) and bubinga (foreground).