

Woodworking

PROJECTS FOR BEGINNERS



How to design Indoor Projects

Volume 2

Frank Brody

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Introduction

No one becomes an expert woodworker overnight, but it has to be a starting point. You may find this starting point in this book. Like all artisans, woodworking has special concepts. In terms of equipment and practice, it is full of everyday words. Do you want to learn all this?

Then you are in the best place. Since furniture itself is the heart of furniture manufacturing, we start with a few pieces of furniture. Once you have started researching the furniture you want to deal with, or if you are drawing what you want to build, this guide will help you step by step. Knowing the language of woodworking will not make you a professional woodworker, yet it can help you master this ancient craft, implement their ideas and express them. This craft connects you in the same way. With the traditions and history of woodworking. What will you learn in this book?

How to build a leg

How to make flower inserts

Veneering the front and side aprons

How to build back aprons

How to stick the foundation

How to make a coffee table

And many other things you can become great with and enjoy in it.

It's time to start!

How to build a Card Table



Chapter 1 Basics of a Card Table

Card Table with tapered legs and string inlay, are frequently attributed to the 18th-century furniture designer George Hepplewhite, but research suggests that this association may not be exclusively accurate.

I made a similar table from cherry, with crotch mahogany veneer on the aprons. The legs require 6 bd. ft. of 8/4 stock, which is enough for the table's four legs plus one extra for confirming the tool setups for the many machining operations involved with the inlays.

The top requires 11 bd. ft. of well-matched 4/4 stock. You'll also need a supplementary 2 bd. ft. of 4/4 cherry for the back apron, which is essentially a three-part building that embraces an inner apron dovetailed into the side aprons and the two-part knuckle-joint gate-leg mechanism that supports the hinged top when open.

The cherry apron beads can be made from leg or top scraps. The front and side aprons are stack-laminated poplar, band sawn to shape and then veneered. I used about 10 bd. ft. of $\frac{3}{4}$ in. thick poplar for the laminated blanks.

Since of the curved aprons and the intricacies of the inlays, the first step in building this table is to make full-scale drawings to work out the particulars in actual size.

You'll need patterns for the curved parts anyway, and so you might as well prepare them ahead of time. In addition, if you buy the oval flower inlays and the banding that trims the lower leg as I did, you should have them on hand in advance beginning the venture.

I got my inlays traditionally made from holly, maple or satinwood. I had a piece of 4/4 satinwood, which I sawed into 1/16 -in. wide inlay strips.

Chapter 2 How to build the Legs

1. Begin by ripping the five 1 11/6 in. sq. leg blanks from the 8/4 stock.
2. Crosscut the blanks to completed Distance, and then taper each side make use of a jig that holds the leg at a slight angle as it's passed through the table saw.
3. The taper begins 4 in. below the top of each leg and extends to its base, which is only 5/8 in. sq.
4. After tapering, each leg requires five separate operations to cut the grooves for the inlays.
5. The legs must also be mortised to receive the apron tenons and dadoed for the lower apron bead that runs across the legs, but it's best to do these operations after constructing and veneering the aprons to ensure these joints are located properly.
6. You should cut the banding grooves around the bottom of the legs first as they make handy stops for the long stringing grooves that you will cut afterward.
7. This bit of wisdom comes from hindsight; I cut the stringing grooves first.
8. I routed the banding grooves on the tapered legs with the aid of a miter gauge, even though the router table had no miter gauge slot;
9. I simply ran the gauge's bar along the table's front edge with the router table fence clamped parallel to the front edge to locate the grooves.
10. I set the miter gauge angle to compensate for the legs' taper by making test cuts on the fifth leg and measuring up squarely from the bottom of the leg until the groove ran parallel to the bottom.
11. I made the long, straight grooves for the stringing with a Dremel tool fitted with a router-base attachment and guide.
12. To cut the 3/4 in-radius grooves at the top of the stringing pattern, I made a 1/8 in. thick Plexiglas fixture that has a 1/8 in. dia. hole in the centre of each of the arcs.
13. A pivot pin screwed through the router-attachment base is inserted into each centre hole in turn and the Dremel tool is pivoted to cut the arcs.
14. I used a pair of dividers with a dowel taped to one leg to locate the fixture on the surface to be inlaid.
15. When the fixture was aligned so the arcs began at the ends of the straight stringing grooves and met at the centreline of the leg, I clamped the fixture to the leg and cut the grooves.
16. After cutting the banding and stringing grooves, I ripped out the thin satinwood strips.
17. When I got around to fitting the curved stringing sections, I discovered that satinwood is too brittle to bend well, and so I had to soak the stringing in water for numerous minutes and then bend it over a hot pipe mounted on a soldering iron.
18. The soaking and heating had to be repeated numerous times to achieve the desired bend, and even then I broke numerous pieces.
19. I cut and fit all the stringing for one leg surface at a time, including miters at the curves, and then glued the pieces in right away so I wouldn't lose them.
20. The stringing expands to somewhat when it absorbs glue; so you should press the pieces into the glue-filled grooves as rapidly as possible.
21. The expansion holds the pieces so rightly that there is no need to clamp the stringing.
22. After all the stirring is applied, I glued the banding strips into their grooves at the base of the legs.
23. In advance inlaying the flowers, I sanded the stringing and banding flush then made use of 100-grit paper on a sanding block.

Chapter 3 How to make Flower inlays

1. My table required eight sets of satinwood bell flowers.
2. Each set has four flowers that diminish in size from top to bottom, and so I required 32 flowers in all.
3. To streamline the procedure of cutting out the flowers, I glued up a stack of nine pieces of satinwood veneer with a piece of paper amongst each layer so the stack could be simply separated later.
4. The ninth layer gave me an extra set of flowers just in case.
5. After cutting out the flowers with a scroll saw, I sanded and filed each stack to final shape and then inserted a sharp knife, but you could also make use of a razor blade on the paper glue line to pop the veneer layers apart.
6. Inlaying the 32 separate flowers isn't hard, but it is slow work.
7. It's not something you can whip out in a couple of hours; so realize up front that you have to take your time.
8. To begin, place one of the large flowers carefully on the centreline of the leg and trace around it with a sharp pencil; do one flower at a time.
9. I use my Dremel tool with a router base to clear out most of the wood, and then I clean out the tight curves and final fit each flower with a knife and a small chisel.
10. For both the routing and the final fitting, I use a lighted magnifying glass - the kind that clamps to a table top and that jewellers frequently use.
11. I've found that if I'm satisfied with the way an inlay looks through the magnifying glass, it really looks great without magnification.
12. Fit one flower at a time and then glue it in place with a clamp and waxed-paper-covered block.
13. By the time you've inlaid one flower on each leg, the first leg will be dry enough to unclamp so you can inlay it's after flower.
14. The six oval inlays at the top of the legs are fitted the same way as the flowers.
15. After all the inlaying is complete, finish-sand the legs through 220-grit.
16. Ensure that all traces of dried glue have been sanded away.
17. I thought I had done a thorough sanding job, but when I sprayed on the first coat of lacquer, numerous glue smears showed up and I had to re-sand all of these areas.
18. You can locate dried glue in advance finishing by wetting the wood's surface with water: glue residue will show up as light-colored areas.

Chapter 4 How to Veneer the front and side aprons

1. The front and side apron blanks are made by stack laminating $\frac{3}{4}$ in. thick yellow poplar to the following sizes: one $3\frac{1}{2} \times 4\frac{1}{2} \times 21\frac{1}{2}$ front apron; and two $3\frac{1}{2} \times 3\frac{1}{2} \times 15$ side aprons.
2. Use the gridded drawings of the front and side aprons to make full-size templates for laying out the curves on each blank.
3. When you band saw the curves keep the cuts as clean as possible, Since the waste part of each apron will be used to clamp the veneer to the apron.
4. Sand or scrape out any slight irregularities in the apron curve, and then screw temporary blocks to each end of the waste portion of the apron blank to ensure perfect alignment when laminating the veneer.
5. I recommend make use of backed veneer if you can find it as it is much easier to handle than single-ply crotch mahogany.
6. I bought book-matched crotch mahogany veneer backed with poplar veneer.
7. Cut the veneer so it overhangs about $\frac{1}{4}$ in. on both edges of the blank.
8. Then glue the veneer to the outer face of the apron, clamp the waste half of the blank over the veneer with C-clamps and let it dry overnight.
9. The next day, unclamp the aprons and trim the overhanging veneer with a sharp knife.
10. The ends of each side apron must be trimmed to distance at a 58 degree angle from the straight rack side.
11. Since of the hardy of cutting tenons on these angled ends, the side aprons are doweled into the front legs.
12. In addition, a notch must be cut at the back end of each side apron to square off an area to receive the dovetailed rear apron.
13. Make the 58 degree parallel end cuts make use of the miter gauge on the table saw and with the blade tilted 32 degree from its usual 90 degree position.
14. Then lower the blade and make the 58 degree cut on the inner face of the side apron to form the notch that will house the rear apron.
15. Return the blade to it's square position and complete the notch by standing the apron on its back end and supporting it with the miter gauge.
16. After notching both side aprons, raise the blade and trim the front ends of both side aprons in a similar manner, with the aprons standing on their front ends, to form a flat area to join with the glue blocks.
17. The tenons that join the front apron to the legs must be cut in two steps as of the curve on the aprons face.
18. Trim the apron to distance first, allowing for the $\frac{3}{4}$ in. long tenons.
19. Then, on the table saw, cut the tenon shoulder and cheek on the aprons back side with its flat side down.
20. The apron can't be flipped over and run facedown as of the curve and so the top shoulder and cheek must be cut from above with the radial-arm saw.
21. I made the tenons $\frac{5}{16}$ in. thick and centered them on the apron's squared-off ends.
22. When locating the mortises and the dowel holes in the front legs, keep in mind that the aprons are set back $\frac{1}{8}$ in. from the corner of those legs.
23. I bored the $\frac{1}{2}$ in. dia. dowel holes in the front ends of the side aprons on the drill press by clamping a wood hand screw to the back end of the apron to provide a „foot" to stand it up vertically on the drill-press table.
24. Then I used another hand screw as a leg to support the upper portion of the angled apron I inserted commercial dowel centres into the holes to locate the mating holes in the legs.
25. To complete the front legs, locate and cut $\frac{5}{32}$ in. wide by $\frac{3}{16}$ in. deep dadoes on the outside surfaces of each leg to receive the bead that runs around the bottom of the aprons.

Chapter 5 How to build the Rear aprons

1. The three-part rear apron consists of a long inner apron dovetailed to the side aprons, and two short aprons that are tenoned into the rear legs and joined at the middle with a knuckle joint, or wooden hinge.
2. The apron that's joined to the fixed rear leg is screwed and glued to the long dovetailed apron, while the other is tenoned to the gate leg and allowed to pivot to support the table top when the flap top is open.
3. To determine the distance of the dovetailed apron, dry-assemble the front legs with the front and side aprons, and then while holding the joints together firmly, measure the exact distance amongst the notches in the back ends of the side aprons; don't forget to add the distance of the dovetails.
4. When making the two-part outer rear apron, don't cut the parts to exact distance; leave each about 2 in. too long until after you've cut and fit the hinge.
5. There's no reason to be scared by the idea of making a wooden hinge.
6. Simply lay out the interlocking fingers directly on both hinge parts and mark the areas to be cut.
7. Set the table saw blade at the same height as the thickness of the parts, and while holding the work piece vertically and supported by the miter gauge, make repeated cuts to eliminate the waste.
8. In advance rounding over the curves to form the knuckles put the two parts of the hinge together and make use of the drill press to bore the $\frac{1}{4}$ in. dia hole for the steel hinge pin.
9. Drill clear through the hinge assembly so you can simply eliminate the pin when trial-fitting.
10. You'll trap the pin at final assembly by gluing a dowel plug in the bottom of the hole.
11. After drilling the hole, take the hinge apart and make use of a disc or edge sander to round over the curves that form the hinge's barrel; replace the pin and ensure the gate-leg apron swings through 90 degree, even when the fixed apron is held firmly to the dovetailed rear apron.
12. When the hinge is complete, cut both parts of the hinged apron to distance, allowing $\frac{3}{4}$ in at each end for the leg tenons.
13. Instead of centering the rear leg tenons as on the front apron, I made them flush with the back surface of the aprons to give the mortise a bigger setback in the gate leg.
14. Lastly, locate and cut a mortise in each rear leg so that the hinged apron's inside face is flush with the face of the leg.
15. The front and side aprons can now be finish-sanded to 220-grit in preparation for assembly.
16. Nevertheless, In advance gluing up the table base, make use of the front and side aprons as patterns for band sawing the $\frac{5}{32}$ in. thick cherry that is glued to the bottom of the aprons to form the bead.
17. Ensure that the front edges will protrude about $\frac{1}{8}$ in. and round over these edges with a finger plane or small-radius router bit.
18. Also, round over some of the scrap from the curved pieces to make the short sections of bead for the legs.

Chapter 6 How to Glue up the base

1. Since of the unusual building of the base, I glued it up in numerous steps.
2. First, I glued the two hinged aprons to the rear legs and the side aprons to the front legs.
3. In order to clamp the side aprons, I had to screw blocks to the inside of the aprons temporarily.
4. After the side apron front leg assemblies were dry I glued the front apron and the dovetailed back apron in place.
5. Then I cut, fit and screwed in the corner glue blocks.
6. Afterward, I glued and screwed the fixed rear apron/leg assembly to the dovetailed apron and attached the gate-leg assembly by inserting the hinge pin into the knuckle joint, after plugging the bottom of the hole with a short dowel.
7. Lastly, I glued the apron beads in place, and fitted the small leg beads into the dadoes and glued them in place.
8. I used metal clips to secure my table top to the aprons.
9. These table top fasteners, which hold the solid top to the aprons while still allowing it to expand or contract, are obtainable from most woodworking companies and in some hardware stores.
10. With the table standing on all four legs, it's easy to rout the slots with a 1/16 in.-wide, winged slot-cutting bit; of course, you need to buy the clips first so you know how far the slots should be from the upper edge of the aprons.
11. Building of the two-part table top is very straightforward.
12. The 4/4 stock is planed 13/16 in. thick and then glued up to make two pieces about 20 in. wide by 37 in. long.
13. When these top blanks are dry, the glue squeeze-out is scraped from the joints and the mating (hinged) edge of each blank is cleaned up on the jointer.
14. Then apply double-faced tape to the surface of one blank, and place the other blank on top, taking great care to perfectly align the mating edges.
15. The top's shape is then drawn on the upper surface from a full-scale pattern and both pieces are band sawn out at the same time with the two table top halves still stuck together, sand the sawn edges to completed shape.
16. Then you can separate the two halves and make use of a router with a ¼ in.-radius bit to round over the inside mating edge of both top pieces to provide clearance when the top is opened and closed.
17. I bought my card-table hinges and I had to grind down a ½ in wide high-speed steel router bit to cut the 15/32 in. wide mortises in the edges of the table tops to receive the hinge leaves.
18. I recommend that you make use of steel screws for fitting the hinges initially and then replace them with brass screws at final assembly.
19. At this point, you can place the assembled top on the base, screw the table top fasteners to its underside and confirm that the top and gate leg both open and close as they should.
20. Lastly, disassemble the table top from the base and the hinges from the tops and apply the finish.
21. I used spray lacquer, rubbing amongst coats with 400-grit paper and smoothing the final coat with 0000 steel wool to develop a satin sheen.

How to make a Coffee Table



Chapter 7 Understanding Coffee Basics

Ever since I started building furniture, I've taken pleasure in making the many different components in a piece and seeing them all fit together like pieces of a puzzle.

As I progressed as a craftsman, the joints got better and more complex, and my pleasure of the procedure increased. But making a lot of tight-fining joints can be quite time-consuming and expensive, and most of my clients have tight budgets.

They have come to me as they want something more than they can get in the department store, but they can't necessarily afford to have me spend a lot of time doing greatly detailed work.

I frequently have to find ways to compromise while still aiming to develop beautiful furniture of sound building. I look for ways to simplify, and to make use of what tools and supplies I can afford and to make bounded resources grant handsome returns.

I had a challenge of this kind when a client approached me about making a coffee table. Together we settled on a basic table in the Craftsman vein and a carefully trimmed budget for the job.

Two hallmarks of Craftsman furniture are pinned through-mortises and legs coopered or veneered so quarter sawn grain shows all around. But I decided to leave them out of my table, substituting the straightforwardness of loose tenon joinery and solid-wood building.

Chapter 8 Laying out the lumber

1. I went looking for about 30 bd. ft. of quarter sawn white oak.
2. What I found was a few very rough boards that had turned quite black.
3. After the first pass through my planer, I could see that the wood was not white oak.
4. What emerged was beautiful red oak of a diversity I had never seen In advance.
5. I decided it would suit my purpose well.
6. With the freshly planed boards arrayed on my outfeed table, I studied the grain and color to decide where the boards would be used to their best advantage.
7. First I selected the boards for the top.
8. These should be picked not only for their beauty but also with an eye toward having even color and straight grain along the edges, so they match well when joined together.
9. I needed four pieces for the top.
10. I first crosscut them a few inches over distance and arranged them as they would be joined.
11. After that, I marked a triangle across all four, so I could simply orient them.
12. Then I arranged and marked the shelf boards and cut them to rough distance.
13. I don't have a jointer, but with short boards, I can get good glue joints by ripping them a few times on the table saw, taking off about 1/16 in. with each pass and confirming them for fit after each cut.
14. For longer stock or "waney-edged" pieces, I clamp a straightedge to the board and joint it with a flush-trimming router bit.

Chapter 9 Completing the top

1. I glued up the top and shelf with pipe clamps, I used a $\frac{3}{4}$ in. dowels laid parallel to the boards as clamping blocks.
2. The dowels concentrate the pressure right in the centre of the stock and minimize the clamps tendency to tweak the boards up or down.
3. I keep a stock of dowels of various diameters set aside for this purpose.
4. I find it much easier to grab a pair of the correct size than to hunt down scrap or make up pressure blocks to the thickness of the work piece each time.
5. After the glue had set, I belt sanded the slabs.
6. I run my sander diagonally to flatten glued-up panels, feeling for the high spots and concentrating on them to attain a nice, flat surface.
7. I start with a 100-grit belt, first sanding diagonally and then with the grain.
8. Then I change to a 120-grit belt and sand with the grain only.
9. People frequently complain that a belt sander is hard to control and easy to gouge with, but I have advanced a good working relationship with my 3 in. by 21-in. Makita.
10. With practice, you can gain the touch required to flatten a wide surface.
11. Once the belt sanding is completed, I switch to a random-orbit sander and work through the grits, starting with 120 and moving on to 180 and 220.
12. Then I hand-sand with a block and 220-gritpaper to eliminate any slight swirl marks the random orbit may have left.
13. On a rather forgiving wood like oak, this step is my last, but with something hard and close-grained like cherry, I might finish up with 320-grit paper.
14. Someone once asked me when you know you've sanded enough, and the truth is that never enough.
15. There's always more you could do, but it's vital to work technically and take all to the same level of finish.
16. Instead of belt sanding, you could make use of hand planes to flatten the top and shelf or rent time on a big thickness sander.
17. Panels this wide cry out for a panel saw of some kind when it comes to crosscutting, but I don't have one.
18. Instead, I clamp a crosscutting fixture square to the sides and cut one end with a hand-held trim saw, which is a small circular saw.
19. When I had one end straight and square, I made the second cut on the table saw about $\frac{1}{4}$ in. longer than required.
20. Then I flipped the top around to make a finish cut on the trim-sawn end.
21. I laid out the width so the two outside boards were roughly equal and ripped both sides.
22. I used this technique, and I got good table saw cuts on all four sides with no tear out.
23. A few strokes with a block plane were all that was required to clean up the edges.

Chapter 10 Building the legs

1. I glued up the blanks for the legs by sandwiching a piece of $\frac{1}{2}$ in. stock amongst two $\frac{3}{4}$ in. pieces.
2. I typically make legs from single sticks, but in this case, I couldn't obtain thick enough stock when I required it.
3. I took a lot of care with these laminations, matching the layers for color as well as grain orientation.
4. When I was done, the joints were barely perceptible even under close examination.
5. I ripped the twelve pieces for the leg blanks $\frac{1}{4}$ in. oversized in width and 5 in. oversized in distance.
6. The extra width gave me some leeway for slippage while the glue-up and for the final ripping to distance across.
7. The extra distance ensured that any snipe left by the planer in final thicknessing could be cut off.
8. I arranged the legs carefully, so matching grain would show on each side of the table.
9. Then I held them together, and across the top end grain of the four pieces, I drew a single triangle.
10. This quick marking technique makes it easy to establish the orientation of a part at any point in the building procedure.

Chapter 11 Using Loose tenon

1. Loose tenoning is the technique I use most frequently for making structural joints as it is robust and straightforward.
2. Also called a splined mortise or floating tenon joint, the loose tenon joint is simply a pair of mating mortises with an independent tenon to span them.
3. With a mortising fixture the joints are easy to make.
4. You could also make the mortises by hand, on a router table or with a hollow-chisel mortising setup.
5. I make loose tenons from the same material as the table, so all seasonal movement will be the same.
6. Just ensure the grain runs the distance of the loose tenon.
7. For this table, with 1-in. wide mortises, I first ripped long strips 15/16 in. wide and 7/16 in. thick.
8. Then I thickness-planed them to exact size, confirming them every pass or two in a sample mortise until I got that wonderful feeler-gauge fit.
9. If you have to use strength to pull the spline from the mortise, the fit is too tight; if there's no resistance, it's too loose.
10. Making the tenons 1/16 in. undersized in width leaves room for excess glue and also gives you some welcome lateral adjustment in the glue-up.
11. I rounded over the tenon edges on the router table and then cut them to distance 1/8 in. shorter than the combined depth of the two mortises.
12. With all but the shelf and spindle joints cut, I dry-assembled the table.
13. At this point, I measured amongst the stretchers to find the distance of the shelf.
14. This dimension could be calculated, but as even a slight misplacement of a mortise or variation in the thickness of the stretcher could throw all off, I find it better to measure the distance once all else has been done.
15. I cut the shelf to size in the same way that I cut the top.
16. It is attached to the stretchers with loose tenons, but only the center tenon is glued.
17. The outer tenons, cut narrow by 1/8 in. and left loose, give the shelf room to move with changes in humidity while supporting it firmly.
18. The spindles are too small for loose tenons, so I tenoned their ends and cut mating square mortises in the stretchers and aprons.
19. As I played around with the placement of the spindles, I decided that a 1/4 in set-back from the outside edge of the stretchers and aprons gave it the feeling I wanted.
20. It's surprising what a difference 1/8 in. can make in places like this.
21. If you pull the spindles up to the edge of the rails, you create a flat surface; if you push them in a bit, suddenly the spindles impart a feeling of structure and strength.
22. Given the thickness of the stock I had, this decision meant cutting tenons with no shoulder on the outside face.
23. I could have used denser material for the aprons and stretchers, but none was readily obtainable.
24. So to get the job done and to keep my expenses down, I worked with what I had.
25. I cut the tenons with a dado set on the radial-arm saw.
26. I chopped mortises for the spindles on the drill press with a 3/8 in. mortising chisel.
27. I wanted the mortises to be 3/4 in. by 3/8 in., so I made a 3/8 in. spacer block, which I placed in front of a stop block on the fence.
28. Once the stop block was clamped down at the right spot, I could make a mortise in two quick chops, one with the spacer block and one without.
29. The sides of the mortises required a little clean-up with a chisel, but the ends, which are severed end grain and provide no glue surface, I left rough.

Chapter 12 Using the Curved supports

1. With all the other parts milled and joints cut, I turned to the corbels.
2. These curved supports, borrowed from architecture, are one of the elements that differentiate Craftsman furniture.
3. In this case, they're not structurally significant, but like the deep set-back of the spindles, they lend the piece a sense of weight and solidity.
4. Since I'd left out other decorative particulars, I wanted to get these right.
5. I started by making a template and I drew what I felt was a pleasing shape for the corbels on a ½ in. piece of plywood and cut it out with a jigsaw.
6. To fair the curve and rid it of saw marks, I used a technique I learned from a friend with boatbuilding involvement.
7. I folded sandpaper around 1/16 in. thick sliver of wood.
8. The sliver conforms to the curve, riding over low spots and cutting the high spots.
9. If the initial cut is reasonably true, this rapidly develops a perfectly fair curve.
10. Then I used the piece of plywood as a template to shape the corbels.
11. I first jig sawed the corbels a bit too large and then nailed the template to them with a couple of brads placed in the edge that would be let into the leg.
12. By running the template in contradiction of a flush-trimming bit in the router table, I rapidly developed identical copies.
13. The corbels fit into the leg with a stopped dado, which I cut on the table saw using a stacked dado blade.
14. I set the fence to position the dado in the center of the leg and clamped a stop block to the fence so that the cut would stop exactly where the corbels end.
15. When the leg hit the stop block, I turned the saw off, waited for the blade to stop and eliminated the leg.
16. It is quite easy to finish the stopped dado with a chisel.

Chapter 13 Assembling the piece

1. The corbels were the last parts I made.
2. When they were completed, my favourite moment had arrived-the time for dry-assembly.
3. If all the joints are just right, dry-assembly is a joy to do as all snaps together and holds firmly without clamps.
4. In this case, I could lift the whole assembly by one leg without anything coming apart.
5. This little act gave me a thrill and impressed my customer.
6. In advance final assembly, I block sanded all and eased all the edges.
7. Some sanding will always be required after glue-up, but it is easier to do the bulk of it beforehand when all the pieces lie flat and all their faces are easy to reach.
8. I did the assembly in stages, first gluing up each end and later linking them together.
9. I started the glue-up by fitting one set of spindles into their stretcher and apron mortises.
10. As soon as these joints were pulled tight, I glued the apron and stretcher to the legs.
11. It's vital to square this subassembly by measuring the diagonals with a tape.
12. And I made sure the legs ended up in the same plane by sighting across them.
13. By gluing all this in one operation, I disallowed the possibility of having a skewed spindle assembly that would not fit neatly into the legs.
14. When the glue dried, I glued the two side aprons and the shelf amongst the end frames.
15. I did this on a flat surface, confirming the diagonals again to ensure that the table ended up square and making certain all four legs were solidly on the surface.
16. Frequently a clamp or two must be skewed a bit to achieve this and to ensure the table will not rock later on.
17. I attached the top with cleats screwed solidly to the apron.
18. To accommodate seasonal movement of the top, I drilled oversized holes up through the cleats and pulled the top tight with pan-head screws fitted with washers.

Chapter 14 Last touches for completion

1. For the finish, I applied three coats of Antique Minwax.
2. I rubbed in the final coat with fine steel wool and immediately wiped it off, leaving a beautifully smooth finish that, with occasional re-oiling will only get more beautiful with time.
3. This table was my first effort in the Craftsman style.
4. I had initially suggested this style to my client as I felt that it would fit the decor as it stands up so well to heavy use.

How to make a Patio Table



Chapter 15 Patio Table Basic requirements

The patio table is a fairly formal, but welcome addition any deck or backyard. The lattice grid lends a lightness to a fairly large table. A clever design element holds the grid in place with no need to cut a surrounding rabbet.

The inside length and width of the frame are 1 ½ inches longer than those of the table base. This creates a ¾ inch ledge to hold the grid on top of the rails, within the frame.

The grid itself can be assembled on the workbench and then installed in the table. Prepare the strips one inch longer than cited in the requirements listed, cut the dados for the half-laps, and then trim them to fit.

While it will hold up to reasonable use, but do not expect it to withstand the same stress as your oak dining table. The grid of lattice strips lacks the same strength and rigidity as a solid top. To increase the top's resistance to racking, the curves are joined with bridle joints, which offer twice the gluing exterior of half-laps.

Chapter 16 Assembling the legs and the stretcher

How to cut half-laps

1. The rails should be joined to the legs with half-laps.
2. Start with the side rails and the legs.
3. Install a dado head on your table saw and set the cutting height to half the thickness of the stock.
4. Adjust the fence to make a 3 ½ inch-long rabbet, and then add an extension board to your miter gauge.
5. Cut the rabbets in the side rails and the outside faces of the legs.
6. Afterward, hold the leg on edge opposed to the miter gauge extension and cut the dado in the outside edge to accommodate the end rail.
7. To prepare the end rails, shift the fence for a 1 ½ inch long rabbet, then make the cut on the inside faces of the end rails.
8. The final step is to trim 5/8 inch from each end of the end rails.
9. This will allow the end rails to sit flush opposed to the legs.

How to make pocket holes

1. Utilize a commercial pocket hole cutter to make the pocket holes.
2. The jig should consist of two pieces of ¾ inch plywood joined to form an L-fashioned cradle and two support brackets that angle the cradle at 15 degree from the vertical.
3. Seat the work piece in the cradle, and align the stock so the clearance hole will exit in the middle of the board edge.
4. Install a Forstner bit and drill a hole just deep enough to recess the screw head.
5. Then install a brad-point bit and bore the clearance hole through the work piece.

How to attach the legs

1. Set one pair of legs on a work exterior and apply glue to the rabbets.
2. Slide a side rail in position and secure it with a screw at each end.
3. Confirm for squareness and adjust as necessary, then add two more screws.
4. Repeat the procedure for the other leg and for the second pair of legs.

How to add the end rails

1. To attach each end rail, drill clearance holes in each end then apply glue to the rabbets.
2. With the help of an assistant to hold up the sides on a level exterior, position one of the rails and screw it in place with one screw.
3. Confirm to ensure that it is square and then add another screw.
4. Repeat the procedure for each corner.
5. Confirm the table base for square by taking a measurement across each diagonal; they should be equal.
6. If not, place a clamp over the longer diagonal and tighten it slowly until the two distances are equal.
7. Leave the clamp in place until the glue cures.
8. If you have to make corner half-laps in several boards of the same size, it is worth taking the time to build the jig.
9. Cut the two base pieces and the stop block from plywood the same thickness as your stock.
10. The base pieces should be wide enough to accommodate the edge guides and support the router base plate as you cut the half-laps.
11. Utilize solid wood strips for the four edge guides.
12. To assemble the jig, mark the shoulder of the half-lap on one work piece and set the board face-up on a work exterior.
13. Butt the base pieces opposed to the edges of the board so the shoulder mark is near the middle of the base pieces.
14. Install a straight bit in the router and align the cutter with the shoulder mark.
15. Position one end guide across the base pieces and opposed to the tool's base plate.
16. Without moving the work piece, repeat the procedure to position the opposite guide.
17. Now align the bit with the edges of the work piece and attach the side guides, leaving a slight gap amongst the router base plate and each guide.
18. The first half-lap you make with the jig will rout reference grooves in the base pieces.
19. Slip the stop block under the end guide, butt it opposed to the end of the work piece, and screw it in place.

20. Countersink all fasteners.
21. To utilize the jig, clamp it to the work exterior and slide the work piece amongst the base pieces until it butts opposed to the stop block.
22. Protecting the stock with a wood pad, clamp the work piece in place.
23. Adjust the router's cutting depth to one-half the stock thickness.
24. Then, with the router distance inside the guides, grip the tool firmly, turn it on, and lower the bit into the work piece.
25. Guide the router in a clockwise direction to cut the outside edges of the half-lap, keeping the base plate flush opposed to a guide at all times.
26. Then rout out the enduring waste, feeding the tool opposed to the direction of bit rotation.

Chapter 17 Preparing the lattice frame

How to cut tenon cheeks

1. The curves of the lattice frame are joined with bridle joints for extra strength.
2. The first step is to cut the tenon cheeks.
3. If you are working with a table saw you will need a commercial tenoning jig or a shop-built device.
4. To cut the cheeks set the saw blade to its maximum height and mount the end of the frame in the tenoning jig.
5. Adjust the jig so the blade meets the board at one third of the stock's thickness from the edge.
6. Keen the kerf on the waste side.
7. Turn on the saw and make a pass through the blade.
8. Afterward, flip the board around and make the second cut.
9. Repeat for the opposite end then cut the cheeks in the other frame end.

How to cut the shoulders

1. Once all the tenon cheeks have been cut, trim off the waste on the table saw to make the shoulders.
2. Lay the frame rail on the table and adjust the blade height so it just touches the cheek.
3. Attach an extension to the miter gauge.
4. Hold the rail opposed to the gauge and position the stock with the cutting mark for the shoulder in line with the blade.
5. Clamp a stop block to the extension; this will speed up making repeat cuts.
6. Then feed the stock into the blade.

How to cut the mortise sides

1. If your shop does not have a high ceiling you may not be able to cut the mortises in the stiles utilizing the table saw and the tenoning jig.
2. Instead, saw them by hand.
3. With a rail tenon as a guide, mark the shoulder line and the sides of the mortise on the edges and end of each stile.
4. Then mount the stock on your workbench.
5. This setup makes it easier to cut straight sides.
6. With a back saw, cut down from the corner, keeping the blade on both lines.
7. Stop when the saw blade touches the shoulder line and the opposite corner.
8. Cut its neighbouring side, then turn the board over and cut the other diagonal kerfs.
9. Lastly, finish the sides by cutting straight down to the shoulder lines.

How to chisel the mortise bottoms

1. Eliminate the waste amongst the mortise sides with a mallet and chisel.
2. Mount the stile to your work bench, clamping it firmly in place.
3. Select a chisel the same width as the mortise, or as close as possible without being wider.
4. To clean out the waste, place the chisel 1/8 inch in from the bottom of the mortise and tap it with a mallet so it sinks about 1/4 inch.
5. Set the chisel back toward the end of the board by about 1/4 and tap towards the first cut to eliminate a small notch of waste.
6. Continue in this manner until you reach about half-way.
7. Turn the board over and eliminate the rest of the waste.
8. Lastly pare straight down at the shoulder line.

How to attach the frame

1. Once you have cut the bridle joints, dry assemble the frame and set it on the table base to ensure that it fits appropriately.
2. There should be a 3/4 inch ledge all around the inside edge of the frame, which will support the lattice grid.
3. Disassemble the frame and spread some glue on the tenons.
4. Reassemble the frame, confirm for squareness, and clamp each joint with a pair of clamps.
5. Then round over the outside edges of the frame.

6. To secure the frame in position, set it on the rails and arrange it to create an even 3/4 inch ledge.
7. Hold the frame in place with a clamp in each corner and secure it with a screw in each pocket hole.
8. You can utilize the jig to cut tenons on the table saw.
9. Adapt the dimensions suggested to customize the jig for your saw, if necessary.
10. Cut the jig fence and back from 3/4 inch plywood and saw a 45 degree bevel at one end of each board; the pieces should be wider than the height of your saw's rip fence.
11. Fasten two pieces together face to face to fashion the back, then utilize countersunk screws to attach the fence and back in an L shape.
12. Ensure the fasteners will not be in the blade's path when you utilize the jig.
13. Afterward, cut the brace from solid stock, bevel its ends, and attach it flush with the top edges of the fence and back, forming a triangle.
14. Make the clamp by face gluing two pieces of 3/4 inch plywood and cutting the assembly into the shape.
15. Utilize a hanger bolt, washer, and wing nut to attach the clamp to the jig back, leaving a gap amongst the edge of the clamp and the fence equal to the thickness of the stock you will use.
16. Offset the bolt so the clamp can pivot eccentrically.
17. You can drill supplementary holes in the jig back so you can shift the clamp to accommodate different stock thicknesses.
18. Afterward, cut the runner from solid wood.
19. When attached to the jig fence, the runner will straddle the saw fence, eliminating any wobble.
20. For some models, you will have to mill a groove down the length of the runner to fit the rip fence.
21. Lastly, cut a piece of clear plastic as a blade guard and screw it to the jig back flush with its front face.
22. To utilize the jig, set it on the saw table in front of the blade with the runner and fence straddling the rip fence.
23. Clamp the work piece in the jig and position the rip fence to align the cutting mark on the work piece with the blade.
24. Feed the jig into the cutting edge.
25. Your first usage of the jig will develop a kerf in the back.
26. Flip the work piece around and repeat to cut the other cheek.
27. Eliminate the jig to cut the shoulders.

Chapter 18 Assembling the lattice grid

How to dado the cross strips

1. The strips that make up the lattice grid are joined with half-lap joints-more than 300 in total.
2. Position the dadoes with a modest indexing jig.
3. Mount a $\frac{3}{4}$ inch-wide dado head on your table saw and adjust the blade height to half the width of the stock.
4. Fix the jig to a miter gauge extension to leave $1\frac{1}{2}$ inch space amongst dadoes.
5. Start with stock one inch longer and then the nominal lengths given in the cutting list.
6. To cut the first dado in each piece hold it on edge opposed to the miter gauge with one end butted opposed to the key.
7. Make a pass through the cutters, then move the board along the gauge, fitting the new dado over the key, and make another pass.
8. Continue in this manner until you have cut dadoes in all the short and long strips.

How to size the strips

1. Both the long and short strips must be trimmed to fit inside the frame.
2. Lay a short strip across the frame and adjust it until the distance amongst the last dado and the frame is the same on both ends.
3. Make a mark on the strip.
4. To trim the strip to this mark install a regular blade in your table saw.
5. Afterward, reposition the miter gauge extension so that when the last dado is fitted over the key, the trimming mark is lined up with the blade.
6. Trim the ends of this strip, and then trim both ends of all the short strips the same way.
7. Repeat this procedure to trim the long strips.

How to assemble the grid

1. Assemble the grid, and then install it as one unit in the frame.
2. Lay out all the short strips-dadoed edges up-on a large work exterior.
3. Space them out by installing a long strip at each end.
4. Afterward, install the rest of the long strips, applying glue first and working the dadoes together gently.
5. Anchor each joint with a 1 inch galvanized common nail.
6. Once all the long strips are in place, eliminate the outside long strips and reinstall them with glue and nail them in place.

How to install the grid

1. Pop the grid in place, and then turn the table upside down.
2. Install angle brackets to secure the lattice in position.
3. To ensure the grid rests flat, screw each bracket to the rails with a $\frac{1}{8}$ inch space amongst it and the lattice strip.
4. After attaching a bracket to its rail, secure it to the correcting lattice.
5. The gap will cause the bracket to be cinched down on the lattice, holding it firmly.

How to build a side chair



Chapter 19 Side chair Basic Requirements

Anticipating modern-day advertisers by more than 100 years, the Shakers proudly promoted their wares to a marketplace of non-believers who were nevertheless poised to purchase quality furniture.

As one of their early catalogues proclaimed, Shaker chairs offered "resilience straightforwardness, and lightness." The level of craftsmanship that they attained enabled them to back up their claims.

Shaker-made chairs sold well, proving that their business acumen was as well advanced as their piety. The Shakers had astutely reasoned that chairs were the right product for the market.

First, chairs required rather little stock to build-compared to case furniture-so they could be made economically. Furthermore, most models could be built quite rapidly, and they were compact and light enough for easy storage and transportation.

Lastly, chairs are a common household item; most buyers required several. All of these factors enabled their chair-making enterprise to contribute significantly to Shaker prosperity.

The following chapters will present step-by-step instructions for building three classic Shaker chairs. The Enfield side chair features a straightforward design that belies the fine craftsmanship and precise joinery required to build it.

Its legs, rails, and stretchers are turned on the lathe, and the pieces are connected with mortise-and-tenon joints.

The chair back consists of slats that must be steam bent. A traditional technique for forming the chair seat-woven rush-is will be discussed later. With its turned parts and mortise and tenon joinery, the rocking chair shares numerous features with the Enfield.

Nevertheless, the rear legs of the rocker, which are bent for comfort, and the rockers themselves fixed to the legs with dowel reinforced bridle joints-are elegant refinements. The chair is named after the community in upstate New York where prototypes were built.

Despite its traditional utilize as a pew for religious functions, the spindle-backed meetinghouse bench has numerous contemporary applications. Each of these chairs early examples of which are still intact today embodies the Shaker belief "Build as though you were to live for a thousand years".

The most striking feature of the Enfield side chair is its backward slant of 98 degree. The design allows the chair to conform to the anatomy of the typical user and provide comfortable seating without needing steam-bent back posts.

The slant, nevertheless, does present a challenge in executing the joinery. Few of the joints in this chair are cut square; most are assembled at compound angles. It is a good idea to refer back to the side and top views as you build the chair, utilizing the angles to help set up your drill when boring the round mortises.

As an outcome of the seat's trapezoidal shape, the front legs are spaced farther apart than the rear ones. Also, the rear legs are splayed outward from bottom to top by 2 degree.

Consequently, the back stretchers, seat rail, and slats are progressively longer towards the top of the chair. To help you size and prepare the chair legs, mark key dimensions and the location of mortises on a shop-made story pole.

Made from a strip of plywood, the story pole embraces the length of the front and rear legs, and the placement of the stretcher, rail, and slat mortises. The marks on the jig can then be used to cut the leg blanks to length and outline the mortises on the blanks.

The mortises for the front or back stretchers or rails are offset $\frac{1}{2}$ inch lower than the mortises for the side ones to avoid weakening the legs. Label the story pole and keep it for future chair-making.

Chapter 20 Preparing the legs and rails

How to rout the slat mortises in the rear legs

1. Outline the slat mortises on your rear leg blanks utilizing the story pole, centering the outlines on the inside face of each blank.
2. Then secure one of the blanks amongst bench dogs.
3. Install a $\frac{1}{4}$ inch mortising bit in a router equipped with an edge guide.
4. Center the bit over the mortise outline and adjust the edge guide to butt against the stock; utilize the second leg blank to support the router.
5. Make several passes, increasing the cutting depth with each pass until the mortise is completed to a depth of $\frac{5}{8}$ inch.
6. Repeat to rout the remaining mortises in both blanks, and then square the curves of the cavities with a chisel.

How to turn the rear legs

1. Place a rear leg blank amongst centers on your lathe, position the tool rest as close as possible to the work piece without touching it, and turn on the machine.
2. Supporting a roughing gouge on the tool rest, cautiously move the bevel until it touches the blank and the cutting edge starts removing waste.
3. Continue working all along the length of the blank until you form a cylinder, with the bevel rubbing and the tool pointing in the direction of the cut.

How to turn the finials on the rear legs

1. Start by cutting the cove that separates the finial from the cylindrical section of the leg.
2. Use a roughing gouge at first, then switch to a spindle gouge.
3. Holding the tool in an underhand grip and rubbing the bevel on the stock, slice into the wood and make a scooping cut down the middle of the cove.
4. Switch to a skew chisel to shape the finial.
5. Set the blade on the tool rest and advance it until it cuts into the stock.
6. Shape the finial as desired, making sure the bevel is rubbing throughout the cut.
7. Use sandpaper to shape the tip.
8. Turn the other rear leg and its finial the same way.

How to turn the rails and stretchers

1. Turn the rails and stretchers as you did the rear legs, utilizing a parting tool to cut the tenons at the ends of each piece.
2. Ensure a snug fit by making the diameter of the tenons equal to that of the bit you will utilize to bore the mortises.
3. The tenon length should be one half the thickness of the legs.
4. Lastly, turn the front legs.

Chapter 21 Making the slats

How to steam the slats

1. Set up a steaming jig.
2. Also have a bending jig ready.
3. Turn on the steam source and mark the center of each slat.
4. Once steam begins to escape from the jig's drain hole, place a slat inside.
5. Close the end cap firmly and let the wood steam until it is soft.
6. As a rough guide, steam air-dried lumber for one hour per inch of thickness; half that time for green wood.
7. Avoid scalding your hands by wearing work gloves and utilizing tongs to handle the stock.
8. Place the slat in the jig and bend the steamed slat without delay

How to bend the slats

1. To make the bending form, center the mortises for the dowels along the length of the support boards.
2. The distance amongst the two outside dowels should be rather less than the span of a slat when it is curved.
3. As soon as you eliminate a slat from the steamer, rapidly fit it amongst the dowels.
4. Center the slats against the middle dowel and push the ends behind the outside dowels.
5. Alternate the direction of the slats to equalize pressure on the jig.

How to prepare the slats for their mortises

1. Let the slats dry in the bending form for a couple of days, then test-fit them in the rear legs and cut them to length.
2. For a snug fit, sand the ends of the slats on a spindle shaper.
3. Cautiously sand down the part of the back face that will fit into the mortise; confirm the fit periodically as you go.
4. A gouge can also be used to cut away waste until you have a good fit.

Chapter 22 Preparing the legs for the rails

How to prepare the front legs for the front rails and stretchers

1. The only round mortises in the Enfield chair are drilled at 90 degree are those in the front legs for the front rails and stretchers.
2. Use your story pole to outline the hole locations on the front legs and bore them on your drill press.
3. Cut a V-fashioned wedge out of a wood block, creating a jig that will cradle the legs as you drill the holes.
4. Install a bit the same diameter as the rail and stretcher tenons, and clamp the jig to the machine table so the bottom of the V is centered under the bit.
5. Then place the leg in the jig and set the drilling depth to rather more than the tenon length about two-thirds the stock diameter.
6. Holding the leg with one hand, bore the mortises.
7. Repeat for the other front leg.

How to prepare the rear legs for the back rails and stretchers

1. The mortises in the rear legs for the back rails and stretchers must be angled down by 2 degree to compensate for the slight splaying out of the back legs.
2. Set one of the legs upright in a bench vise, making sure it is vertical.
3. Use a protractor to adjust a sliding bevel to 92 degree.
4. Wrap a strip of masking tape around the bit to mark the drilling depth-about two thirds the leg diameter.
5. To help you hold the drill at the correct angle as you bore the hole, tape the handle of the sliding bevel to the leg and keep the bit parallel to the blade of the tool.
6. Stop drilling once the depth flag contacts the stock.
7. Repeat the procedure to drill the remaining holes in both legs, repositioning the leg in the vise and the sliding bevel on the leg as necessary.

How to glue the front and back rails, stretchers

1. Before drilling the holes in the legs for the side rails and stretchers, assemble the front legs and then the rear legs.
2. Starting with the front legs, spread glue on the rail and stretcher tenons and in the leg mortises and fit the pieces together.
3. Tap the joints into final position with a wooden mallet.
4. Repeat for the rear legs, gluing the slats in place as well.

How to prepare the legs for the side rails and stretchers

1. The mortises in the legs for the side rails and stretchers must be drilled at compound angles they are angled in both the horizontal and vertical planes.
2. Start by securing one of the rear legs in a hand screw and clamping the assembly upright to a work exterior.
3. Then utilize the chair seat and side views, a protractor, and a sliding bevel to determine the drilling angle as you did in step 2.
4. But instead of taping two sliding bevels to the stock, cut two square pieces of plywood, clamping one to the leg to indicate the vertical angle and the second to the rail or stretcher for the horizontal angle.
5. For each hole, align the bit with the top edge of the vertical guide and the side edge of the horizontal guide.
6. Again, stop drilling when the drilling depth flag contacts the stock.
7. Utilizing similar techniques, drill the front leg assembly.
8. Once all the mortises are drilled, spread glue on the tenons of the side rails and stretchers and in the mortises, and fit the pieces together.
9. Use a wooden mallet and a wood block to tap all the joints into final position.
10. Then set the chair upright.
11. The four legs should all be flat on the floor.
12. If not, you may have to apply firm but gentle twisting to one or more of the connections to coax the legs into position.

How to make a Sofa Table



Chapter 23 Sofa table basics

Once I have been asked to design a sofa table. I knew that the piece would have to go with the other furniture in their living room and fit simply into their environment.

The room in question was decorated with an eclectic mix of normal 18th century American and English antiques. The imposing look of the room had colourful floral fabrics and oriental rugs, as well as by a contemporary coffee table.

Even the house itself was extensive architecturally. Since of these things, I decided that the sofa table should incorporate different design motifs and joinery that would match with the restrained stylishness of the home and its furnishings.

Requirements:

1. Aside from lovely wood and a rich finish, I felt the real snap of my clients sofa table should come from particulars, like delicate moldings and lively frets.
2. The design I come up with blends well with most any room featuring English or American period furniture.
3. In the corner of my shop was a particularly lovely piece of highly figured mahogany with wild dark grain streaks.
4. It was ideal for the table's lower shelf.
5. To make the shelf more visible and also to benefit maintain a feeling of lightness about the table, I chose to inset the tabletop with three pieces of glass.
6. This meant I required to finish the aprons and corner frets inside and out.
7. For the aprons, moldings, legs and top-frame parts, I selected pieces of straight grain mahogany.
8. I cut all the pieces to rough width and distance, leaving extra distance for end tenons.
9. After I squared all edges to their faces, I thickened the pieces.
10. I cut the leg mortises and apron tenons and drilled and countersunk holes in the aprons for screwing on the top and shelf.

Chapter 24 How to Get the logs finished

1. To create the profile on the outside corner of the leg faces, I first fashioned the corner bead.
2. I adapted a cutter by grinding down a standard $\frac{1}{4}$ in. beading cutter until each shoulder came to a point.
3. Beading the legs required only one depth and one fence setting, but I had to make four passes for each leg two passes for the center bead and one pass each for the two other corner beads.
4. While I used my shaper to do this, a router table would also work.
5. I used similar multistep cutting to form each face's swell.
6. Made use of two passes, I shaper-cut two curved flutes to form a gentle crest in the middle of each face.
7. Again, single depth and fence settings did the trick.
8. A couple of passes with a block plane, followed by hand-sanding, rounded off the center crest of the swell.
9. Lastly, I cut off the leg blanks tops and bottoms.
10. To lighten the legs visually, I chamfered the inside corner of each from the floor up to a point to somewhat below the frets.
11. To cut the chamfer and its graceful lamb's-tongue like arc, I pressed my jointer into unusual service.
12. I carefully marked and taped to prevent tearout each leg where the chamfer ends in the upper leg.
13. Then I clamped a stop block to my jointer's outfeed table the same distance from the cutter head.
14. Lastly, I set the jointer's fence to 45 degree and the infeed table to the chamfer depth.
15. Since depth of cut is critical, it's a good idea to make a few trial passes on a scrap of 1 $\frac{7}{8}$ in. sq. stock In advance you risk your good wood.
16. For safety, ensure that the test piece is at least 16 in. long.
17. Once your jointer is adjusted properly, slowly feed each leg until the end butts the stop.
18. Back the piece off an inch or two from the stop, and lift the leg from the jointer.

Chapter 25 Preparing the shelf

1. After cutting out the shelf to dimension, I routed the half-round on the shelf edges.
2. Next I made a 1/8 in. thick plywood template to lay out where the legs would meet the shelf curves.
3. I sawed along the shelf's marked off curves and edges, while confirming to see that each cut out fit in contradiction of the chamfer of the correcting leg.
4. I fit the under-shelf aprons and corner blocks afterward.
5. Each end of the apron meets at a 45 degree angle to fit the leg chamfer and is mitered to fit the adjoining apron.
6. I secured the aprons and corner blocks to the underside of the shelf and drilled holes in the corner blocks to accept screws that fasten each leg.

Chapter 26 Framing the top

1. The table's three pieces of $\frac{1}{4}$ in. thick plate glass are inset within a top framework rabbeted and doweled together.
2. The frame's rail-to-crosspiece joinery is the same for the ends and the intermediate crosspieces.
3. I marked and bored dowel holes in the ends of all four crosspieces and in the inner edges of the rails where the crosspieces join.
4. By doing this now instead of waiting until the glass rabbets have been cut, you avoid the nightmare of trying to drill into a profiled edge.
5. After I dry-assembled the parts with the dowels to confirm their fit, I shaper-cut the $\frac{1}{4}$ in.-deep, full-distance rabbets for the glass.
6. I also cut the mating rabbets in the ends of the crosspieces.
7. Again, I dry-assembled the entire frame, so I could confirm the joints in advance gluing up.
8. After I eliminated the clamps, I fashioned the frame's outside bead, the same size as the one in the legs, and the curved edge leading to the bead.
9. The coved molding, which goes under the bead, should not look applied, but instead, should appear integral to the table top.
10. To achieve this effect, I extended the molding underneath the top, which also let me simply glue and screw the molding to the underside of the frame.
11. When sizing the glass for the inset in the frame, don't go by the opening sizes.
12. The distance and width of the glass will essentially be $\frac{1}{2}$ in. bigger to allow the glass to rest on the rabbeted edges.
13. Since the glass is not retained by applied moldings, the inset fit is critical for appearance.
14. To get a precise fit, I cut out paper templates for the three glass pieces.
15. Instead of ordering the plate sizes from a glass shop, I sent the templates to a glass factory, which furnished me glass with 90 degree polished edges.
16. In advance I inset the sections of glass, I darkened all the edges with a walnut-colored design marker.
17. Darkening the edges makes the inset look neater.

Chapter 27 Marking and Carving frets

1. The 5/8 in. thick frets, which visually brace the leg-to-table top curves, are made of solid mahogany.
2. In advance I cut out the frets, I made a template from 1/8 in. birch plywood.
3. The template extends past the actual fret pattern; once the shape is cut from mahogany, the extra wood at the edges reinforces the unsupported fret spokes.
4. These edge stiffeners strengthened each fret while I was sawing and carving its shape.
5. I traced the template onto eight pieces of mahogany that had the grain running at a 45 degree angle to the edges.
6. I then cut the frets' curves square.
7. If the leg-to-apron angle is not exactly 90 degree, fitting the frets will be hard.
8. I band sawed the frets' outer curve, and with scroll and coping saws, I cut away the interiors, leaving the edge reinforcement intact.
9. Since the frets must be carved in pairs with their grain opposing, I marked the front face of each.
10. Afterward I drew ridge and depth carving guidelines on all the front faces.
11. Much like the roof of a house, the ridge line describes where the two sloping faces of a fret spoke meet; the depth lines indicate the bottom of each slope.
12. While carving the frets, be mindful of short-grain and the inherent delicacy of the fret spokes.
13. I've found that gently paring away thin slices of wood with a razor sharp chisel is best.
14. Once I carved all the frets, I sanded them smooth.
15. Then, to eliminate the edge stiffeners squarely, I used my table saw as follows:
16. First, I set my gauge to 90 degree and situated its fence close to the blade.
17. This is because the fence supports the work right up near the cut, I didn't have to make use of a hold-down, which might fracture the delicate spokes.
18. Then, holding the piece right to the fence with my hands well clear of the blade, I cut an edge stiffener off each fret.
19. It's best to make the cut in a few passes, as you gradually approach the pattern lines.
20. Lastly I rotated the fret 90 degree and repeated the procedure to eliminate the other stiffener.

Chapter 28 Assembling the piece

1. I drilled $\frac{1}{4}$ in. holes to receive dowels that attach the shelf curves to the inner chambers of the legs.
2. In advance assembling the table, I sanded any parts that weren't already sanded and stained the table a mahogany colour.
3. When the stain was dry, I assembled the major components, and then I completed the table with lacquer and a topcoat of padding lacquer, which I rubbed out by hand.
4. To attach the frets, I drilled one edge of each fret where it would be doweled to the leg and drilled a correcting hole in each leg I situated each fret by aligning its dowel to the leg and carefully drilled up through the fret into the underside of the apron.
5. With the fret and its leg dowel glued in place, I inserted another dowel into the apron hole.
6. I trimmed the end of this dowel flush to the fret.
7. While the dowels won't be visible once the table is in place, I stained and lacquered all the dowel ends, so they'd match the frets in advance I waxed the entire table.

Bonus Chapter How to Spray Furniture

Spray the underside of the shelves first. Then complete the inside of a cabinet by spraying the sides, followed by the tops of the shelves. In this way, the most noticeable surface is sprayed last and won't be affected by overspray.

Apply overlapping strokes from bottom to top, but do not apply a crosshatch spray across the grain, as too much finish likely will sag or run on a vertical surface.

Spray the underside of the rails and the inside surfaces that are least visible. Flip the stool and spray the visible areas, keeping the spray gun the same distance from the work piece.

For the tabletop, do the same with the addition of a first pass with the gun angled around the inside edge of the frame. For glass-panel doors as a flat, continuous surface, and apply a crosshatch spray pattern.

Quite a few woodworkers I know are unenthusiastic, even fearful about spray finishing. They believe the tools are too mysterious, too costly, and too hard to master.

In fact, just the opposite is true. There are plentiful simple to operate, reasonably priced spray systems out there. It took me less time to become proficient with a spray gun than it did to master a router.

Best of all, the finish from a gun is frequently so smooth that I don't have to rub it out.

Following sound spraying principles and knowing how to use the tools helps me develop virtually less finishes flaw.

The finest place to spray is in a booth where a powerful exhaust eliminates overspray and dust from the air. If you're spraying solvent borne finishes, you really have no other choice than to use an explosion proof spray booth.

But they're costly. You don't need explosion proof tools to spray waterborne finishes, and they're getting better and better. You only need a place that is well-ventilated and clean.

If you have the floor space, you can build a spray room that has an exhaust fan and intake filters to ensure a steady supply of clean, fresh air. No matter where you plan to spray, check with your local building officials first.

How you prepare the surface is just as vital as how you spray the finish. Sand the entire piece thoroughly for stained work, I usually raise the grain with a damp cloth, let the surface dry, and sand with 220 grit before I spray.

For waterborne finishes and dyes, I sand to 180 grit and spray a light coat of dye stain or finish. This raises the grain and stiffens the fibers, making them easier to sand with 220 grit.

Spraying paint or pigmented lacquers are more involved. Opaque finishes highlight tiny imperfections. They frequently require at least two rounds of filling, sanding, and priming before the wood is ready to be sprayed.

Life would be easier if you could always pour finish straight from the can into a spray pot and begin applying it. But infrequently, you'll have to thin it.

Which thinner you use and how much you add will depend on the material you're applying, the spray system you're using, and what the piece will be used for.

Some manufacturers do a lousy job of providing thinning information. If the appropriate thinner is listed on the label, use it. Since some cans of finish say that the contents don't need to be thinned, they don't list a thinner.

If this is the case, you generally can thin the finish with the solvent that's recommended for clean up. The viscosity of a finish is a measurement of its resistance to flow.

Thinning a finish lowers the viscosity, which allows it to be broken into smaller particles more simply by the spray gun. The finer the atomization, the smoother the appearance.

Thinners can eliminate common spray issues like orange peel, but if used improperly, thinners actually cause issues. Waterborne finishes are especially sensitive to thinning.

Over thinning can prevent the finish from forming a clear, hard film. Some spray-gun manufacturers recommend finish viscosity for a particular needle or tip combination.

This information may be given as a ratio or a percentage of thinner and finish. The viscosity also may be

given as the number of seconds it takes to empty a certain size viscosity cup.

Viscosity cups have small holes in the bottom, which let liquid drain through. Appropriately sized cups are obtainable from most spray system makers.

Temperature and humidity dramatically affect how much thinner to use in a finish and how it will spray. Low temperature and high humidity are not especially conducive to spraying.

Even if you follow all the labels exactly, you may have to adjust the amount of thinner you add. You can keep records of how much thinner you need for different conditions. After a while, you'll get a feel for this.

Your finish and your tools should be as clean as possible since a speck of dirt or dried finish could ruin the job.

To eliminate impurities, pour the finish through a strainer or filter which is obtainable at paint-supply dealers.

As an added precaution, you can install a filter on the end of the dip tube that draws finish from the pot, or put an in-line filter near the gun.

To keep the air that comes from the compressor dry and clean, I run the line through a canister-type separator, which filters out water, oil, and dirt before they get in the hose supplying air to the gun.

The fluid tip in a spray gun controls the amount of finish that gets deposited on a surface. In general, lighter finishes require a small tip. Denser materials or those with a higher percentage of solids require larger fluid tips.

The air cap in a spray gun controls the velocity of the air, which governs how finely the fluid is atomized. Air caps with smaller holes cause the air to leave the gun at a higher velocity, therefore producing finer atomization.

Air caps are matched with fluid tips to give optimum performance. Most guns come equipped with a standard setup appropriate for several finishes. The setup includes a fluid tip that's about 0.5 in. dia. and a corresponding air cap.

The standard setup will develop acceptable results with most finishes, but from time to time it's worth trying other combinations of fluid tips and air caps.

In a turbine-driven HVLP system, the amount of air feeding the gun is continuous, so adjustments to the air pressure can only be done by changing air caps.

If you are using a waterborne finish with a turbine and a bleeder-type gun, ensure that the nozzle stays clean. These guns are prone to blobs of finish drying on the air cap and then blemishing the work.

Spray guns come with adjustments for air and fluid. The type of finish being sprayed, the size of the object to be coated, and the speed of application all play a role in deciding how to control the fluid and air.

I always test my fan pattern and finish delivery rate on scrap wood or cardboard so that I can make adjustments before I actually spray the piece.

Adjusting a turbine powered spray gun is a simple procedure: No matter what type of gun you own, the idea is to start air flowing through the gun first, and then introduces finish slowly until it flows continuously and evenly.

The gun should apply a full, wet coat with no heavy spots or misses. From this point, you can open or close either knob to obtain the best spray rate and fan pattern.

If you want to spray a lot of material in a hurry, open the fluid control more. If you are coating large surfaces, widen the fan pattern.

If you're trying to achieve a fine finish or you're spraying small items, you'll have more control of how much finish is applied and where it lands by restricting the fan and fluid.

But remember, how you set one knob affects the other. For example, if you increase the air flow without adjusting the fluid, the finish may be too fine.

Conversely, opening the fluid control without widening the fan can cause runs and sags. At the ideal settings, the finish will coat evenly and flow together well.

With high pressure spray guns and conversion-air HVLP guns, both powered by a compressor, you have the ability to control the air pressure entering the gun in addition to adjusting the fluid rate and fan shape.

Getting all three adjustments coordinated can be a bit tricky and takes some trial and error, but being able to regulate the air pressure at the gun allows more spraying options.

Irrespective of the size and shape of the object you're spraying, the main thing to keep in mind is that you want to spray an even coat over the entire piece.

Always spray the finish in several thin coats rather than one heavy one. Lighter coats are less likely to run, dry faster, and make sanding between coats easier.

If the pieces you are spraying are so small that the air from the gun blows them all over the place, try placing them on a piece of screen or wire mesh.

I prefer spraying small parts with my turbine HVLP gun since the spray is softer. A good production tip for spraying numerous small pieces is to spray several at once.

Rotate the turntable as you spray so you don't build up too heavy a coat on the pieces. Position large work on sawhorses or a stand, so that the height is comfortable.

You shouldn't have to bend, reach, or otherwise contort your arm or body while you're spraying. You should be able to turn and move the work simply.

From time to time I support the work on stickers or points to ensure that the bottom edge gets good coverage.

To maintain even spray coverage, there are a few things to remember. Grip the gun firmly, but not so tightly that your hand gets tired or uncomfortable.

Point the nose of the gun so it's perpendicular to the work surface, and hold the gun at the same distance from the work on each pass.

Move the gun parallel to surfaces, not in an arcing, sweeping motion. Begin your stroke 6 in. or so before the gun is over the wood, and continue the same distance beyond the other side.

Trigger the gun a split second after you start your motion, and keep spraying until your arm stops. As you spray across the piece, move your arm steadily and smoothly without changing speed.

For most HVLP guns, hold the gun about 6 in. to 8 in. from the surface. This will let you spray a full, wet coat with minimal overspray and decent coverage. Move the gun at about the same speed you would a brush.

Each pass should overlap the previous one by about half. When spraying small objects or tight places, decrease the flow and move the gun closer. To avoid clouds of overspray and bounce-back, work from inside corners out.

Use more wrist action, and trigger more rapidly. On large areas, increase the flow, pull the gun back an inch or two, and make passes in opposite directions.

I lightly spray across the grain to make a tack coat. Then I immediately spray with the grain. In situations where your spray passes intersect, such as the stretcher-to-leg joint of a chair, release the trigger a bit sooner than you typically would.

This will feather out the finish. If overlapping passes still give you an issue, mask off adjacent areas.

It's easy to forget that once you spray a piece, the finish needs a warm, dry, and dust-free place to cure. If you don't have a separate drying area, production in your shop can grind to a halt.

Even if you have a designated area, storing a number of wet cabinets, doors, drawers, and trim pieces can be an issue. I use a system of racks to dry components and store them for short periods.

Plywood trays, slipped into old baker's racks come in handy when I have to dry lots of small pieces. When I'm drying round or odd-fashioned items, like balusters, I hang them on an overhead wire from swivel hooks.

Each piece can be rotated and sprayed and then hung in my drying area. I have made it a ritual to clean my spray gun thoroughly while my work is drying.

After cleaning the parts with the solvent recommended on the finish comprised, I dry them with compressed air. Then I coat all the fluid passages with alcohol and let it evaporate before I store the gun in its case.

Before spraying, make a dry run through the whole procedure. To help prevent you from over coating or missing areas, visualize and then practice the sequence of spray strokes.

While the order in which you spray parts of a piece may vary to some extent, there are a few rules of thumb worth following:

Start with the least visible areas, such as drawer bottoms and cabinet backs, and work your way to those parts that will be seen.

For example, spray the edges of tabletops, doors, and shelves before the tops. This minimizes the overs

pray on the most visible surfaces. Working from the inside-out, holds true for case pieces.

Always work from the wettest edge, so you can simply blend areas you've just sprayed. Where possible, move the gun away from your body, toward the exhaust fan.

This will prevent overspray from settling on previously sprayed areas, and it will give you an unclouded view, too.

1 - SPRAY OVERHEAD CORNERS AND THEN FILL IN THE INSIDE TOP.

2 - COAT INTERIOR BACK AND SIDES. THESE AREAS WON'T BE HIGHLY VISIBLE WHEN THE PIECE IS COMPLETED.

3 - SHELF TOPS AND FRONTS. REMEMBER TO OVERLAP STROKES.

4 - FINISH THE FACE FRAME. BEGIN WITH THE INSIDE EDGES, AND THEN MOVE TO THE FRONT OF THE CASE.

5 - DO THE EXTERIOR CABINET SIDES AND FRONT CORNERS.

6 - SPRAY THE TOP. BY LEAVING THE TOP FOR THE LAST, THE MOST VISIBLE PART OF THE CASE ISN'T MARRED BY OVERSPRAY.

Conclusion

Thank you for reading this book. I hope it was helpful and able to provide you with a good knowledge base that you will need to achieve your goals. Woodworking can be an extremely satisfying and potentially life-changing interest! A wooden work of art can lead to skills you never knew you could get, and maybe even fatten your wallet, and who doesn't like it! Woodworking is as timeless as we are. It has existed from the beginning and is still a privileged skill. The next step is to select a field to try. Consider the time spent per project, the amount committed, and the work space that can be built or built. This will help you get into one or two fields to try. Start with the basics and slowly build your skills by repeating. You will not regret learning this excellent ability.

If you found this book valuable in any way, please don't forget to provide a review that I really appreciate in advance!

About Frank Brody

I'm Frank Brody, I'm 58, I live in Canada with my family. My job and hobby is woodworking. I originally studied to be a locksmith but at a young age I got into a carpentry workshop and "love at first sight"! That's when I decided that woodworking is my world. I've been doing this for over 30 years. I thought now was the time to share some basic woodworking tips and tricks from my life. Thank you to my family for their support in writing this book, and thank you for reading it.