

DIGITAL EXTRAS

Make a
WINDSOR
CHAIR
WITH MIKE DUNBAR



E P B M
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1984 Introduction

This introduction originally appeared in *Make a Windsor Chair with Michael Dunbar* published in 1984.

I have been making Windsor chairs since 1971. When I started, I could find no books on how to make them. I could find no one who was making them to show me how. I learned by reading everything I could about Windsors, by examining old Windsors closely, and by trial and error in the workshop. I have written this book because it is the best way I could find to share what I have learned with a broad audience. My fascination with Windsor chairs resulted from a happy accident. I was twenty-four years old and in college. I was working toward a degree in French and my long range plans called for eventually earning my doctorate. I had no experience working wood, and furthermore had no interest in it whatsoever.

In order to save money I was furnishing an apartment with whatever I could cull from Goodwill and the Salvation Army. One spring morning I stopped at a yard sale. I wandered onto the porch where I found myself looking at a small black chair. It was so unusual that I could not ignore it; it seemed to insist that I look at it. Though the chair cost \$10 (one quarter of my monthly rent and a sacrifice I could not make lightly) I could not bear to leave it behind.

In the following weeks I would get up from bed to stare at the chair. I would study the chair in a darkened room with a flashlight or by candlelight. I discovered a lot about this complex chair, including its marvelously subtle surface that changed character when viewed under these different light sources. I later found out that this surface was the result of the hand tools used by the craftsman to make the chair. I had never seen such a surface before because today's furniture surfaces are usually sanded to a boring, uniform texture.

At the public library I discovered that my purchase was one of an almost unlimited variety of chairs known as Windsors. My fascination contin-

ued to grow so that by my senior year in college, I was in business part-time as a Windsor chairmaker. Before my graduation that year, I already had an order for fifty chairs. Since then, I have had no other career and have never desired one.

When introduced to North America in about 1740 Windsors were a revolutionary new concept in chair manufacture. From the time of the ancient Egyptians, chairs had been put together in one of two ways. Joined chairs were made by fitting square or rectangular tenons into similarly shaped mortises. Stick chairs had round tenons that were fitted into round holes. Windsors are stick chairs, but prior to their introduction the most familiar stick chair was the common ladder-back.

While joined chairs are time consuming and expensive to make, round tenons and holes can be made quickly: tenons by turning or whittling, holes with a brace and bit. Stick chairs therefore, have long been used for inexpensive, everyday seating. But most stick chairs are uncomfortable. Because the back is an extension of the rear legs it cannot recline much before the balance of the chair is upset. A Windsor chair back and legs are separate and both are anchored in a solid wooden seat. The back can recline while the legs can be canted for stability. The development of Windsor chairs meant that at last a chair could be inexpensive and comfortable at the same time.

Making the back and undercarriage distinct and independent systems also allowed them to be interpreted in new ways. The craftsmen who were developing the Windsor form could approach the concept of a chair from a whole new point of view. The Windsor chair designs that resulted from these craftsmen's explorations were so successful that they have become indelibly etched into the American collective consciousness. In this regard, Windsor chairs are perhaps one of the greatest success stories in the history of furniture design. Since the time they were introduced, American craftsmen have never stopped making them. The industrial revolution of the nineteenth century, which moved

furniture production from the workshop to the factory, changed how Windsor chairs were made, but not their basic forms. In fact the last new Windsor type was introduced about 1830. Every Windsor done since then has amounted to a reinterpretation of an existing style.

I have chosen a sack back Windsor and a continuous arm Windsor for this book because over the years they have proven, by far, to be the chairs that are most popular with my customers. These are not the only styles of Windsors, and not every Windsor chairmaking skill is required in making them. But once you have mastered the skills needed for these two chairs those needed for other Windsors can be inferred.

Both the sack-back and continuous arm designs are derived from antique chairs I now own or have owned. The continuous arm was heavily influenced by a chair made near the Rhode Island/Connecticut border during the 1790s, while the sack back is an amalgamation of several chairs of this style. My chairs, however, are not strict copies of the antiques. I have been making these chairs for a long time and as my skill and perceptions grew, so my personal influence on the chairs increased. Over the years, the chairs have changed as I have changed. I am flattered if you find my taste worthy enough to copy.

However, I know that as you become more experienced and competent as a chairmaker and as your insights into the Windsor chair form grow you will begin to impose your own personality on the designs. Just as my antique chairs reflect the personalities of their makers, and my transformations of them reflect my personality, so will your copies of my chairs become your own distinct work.

Likewise I have shown here how I make chairs, but my methods are not carved in stone (or in wood for that matter). Other chairmakers may do things in a different order or may prefer different tools. I would not contest with them which methods are correct or better; I feel that success is the bottom line. If one method works as quickly and as well as another it is equally valid.

Chair designs are personal and the variations that are visually successful are infinite. The same can be said for the various techniques used in Windsor chairmaking. When it comes to the engineering of the chairs however, I am not so tolerant. I definitely feel that some methods are superior to others. Those in this book are the ones that I have discovered to work the best and to be the most logical.

A week before writing this introduction I taught a course in Windsor chairmaking in Los Angeles. As I showed how to assemble the parts, I described how they pushed or pulled against each other to

compensate for the shortcomings of stick construction. One of my students, an aerospace engineer, exclaimed, "This is really high tech!" I was surprised and remarked that the process was more than 200 years old. He explained that high tech does not necessarily mean modern, rather it describes any process at the cutting edge of human capability.

In that case Windsors are high tech chairs. This is evident not only in the chair's engineering, but in how the wood is selected and worked. Riving the parts from green wood allows them to be worked to dimensions that are much finer and more slender than is possible with kiln dried wood, which is used for factory made Windsors. The finished chair is much more delicate in its appearance than is a factory chair, which must have thicker parts to make up for the inferior quality of the wood. This delicacy will surprise a first-time viewer. A good handmade Windsor is delicate, but it is by no means fragile. In fact, the life span of such a chair is several times that of a human being. My observations of broken antique Windsors lead me to conclude that the damage is not generally due to failure of the construction, but rather failure of the wood, which has grown old and brittle and weak.

Writing this book was perhaps the most difficult thing I have ever done. It was far easier for me to teach myself to make Windsors than it has been to sit down and explain those skills on paper to someone else. In the following chapters, I am going to introduce you to an approach to wood, and a way of working it that is most likely markedly different from any of your other woodworking experiences. Here are some things to keep in mind as you read and work your way through the pages of the book.

Each Windsor chair, even if it is a member of a set, is slightly different. The length of a part or the position of a joint is often determined by the chair itself, not by a drawing. For example, the length of the stretchers must be calculated from the positions of the legs on the chair being made, not from a drawing or from a model chair. Over reliance on drawings when making a Windsor is an invitation to trouble.

The measured drawings are based on two chairs that I use as models. My chairs all vary somewhat from these drawings and yours will too. Refer to the measurements as a guide, but do not be a slave to them - the chair will tell you its own requirements.

I work with green wood split from a log. When I am chairmaking full time, I use several logs a month. You will not be this voracious unless you, too, make chairs professionally. You should split parts from green logs to obtain the quality of the wood required to make Windsors, but do not worry

about keeping the wood wet. Forget about such tricks as storing the wood in plastic bags or waxing the end grain. These can promote fungus attack and rot. If you cannot use up a log immediately, split out the wood suitable for chair parts as soon as possible and store it under shelter and off the ground. Split and stored like this, the log will keep indefinitely and can be used at any time, though when it is dry it will not work quite as easily as green wood.

When assembling your chair do not use glue that sets up too quickly. I use and highly recommend a white polyvinyl acetate glue such as Elmer's Glue-All. Aliphatic resin, or yellow glue such as Titebond too often results in a tenon being twisted off when the stretchers are assembled because the glue seizes so quickly.

You will recognize many of the tools used in Windsor chairmaking, but you may not have encountered some of the others. I explain how to use each of these tools as they are introduced and I discuss how to sharpen them. I found all my chairmaking tools at auctions, second hand shops, and through antique dealers. But a few of these tools had almost disappeared by the time I started hunting - it took me several years to find a full set of spoon bits for example.

A Windsor chair is assembled with parts that can be made separately. In fact Windsor chairmakers often bought parts made by others; particularly turnings. I have begun the chairmaking in this book with the seat, because it is the physical and aesthetic center of the chair. When I am making chairs full time however, I organize the work so that I can produce two chairs in four days. To do this, I shape and bend the backs first thing on Monday, so that they will be dry and ready for assembly on Thursday. In chairmaking, as in any other business time is money, and a chairmaker must be as efficient as he is skillful. As you gain experience, you will develop your own order of work to suit your own purposes. For your first chairs however, I recommend that you follow the book. What you learn in one chapter will make the work in subsequent chapters easier to master.

Throughout the book as each part is made I also mention design considerations that make the part successful. Much of this design discussion is subjective; what one person considers good another sees otherwise. I think however, that it is possible for a chair to be made of nice looking parts and still be a visual failure. A well-designed Windsor is subtle. It should not assault the viewer. Instead, when viewed in a room full of furniture, the eye should be delighted when it discovers a Windsor. To achieve this quality, I prefer to restrain each part to make

them robust, but not exaggerated. A chair succeeds because of its unity, never because of just one feature. A subtle chair teases the viewer; the eye cannot notice everything at once. Therefore, each time you look at the chair, you will discover something about it.

I believe that it pays off to keep these thoughts in mind when in the shop. They will help you to make Windsors that not only are comfortable and durable, but good looking, too. I cannot think of anything more that could be asked from a piece of furniture.

I mentioned my production rate in the 1983 Introduction. But I failed to answer a common question: "How long does it take you to make a chair?" From the log to a chair in the white (a chairmaker term that means without a finish) both my sack back and c-arm required 10 man-hours. That is consistent with the old guys' rate. In his landmark book *American Furniture, The Federal Period*, Charles Montgomery worked out a method to determine how many hours were required to make a piece of Federal furniture. The shop owner marked up a piece 100% over what he paid his journeymen. A skilled craftsman earned \$1 for a 10 hour work day - another day, another dollar. So, divide the sale price by two and you have the number of days the piece required. Sacks and c-arms typically sold for \$2, indicating one 10-hour day.

These once-standard tools have a place in the modern shop.



Drawknives

When the last grains of sand run through my hourglass, I know how I want to check out. I want to drop on the shop floor in the middle of a project. The mortician will have to pry my woodworking machines out of the cold dead fingers of my left hand. He will then have to pry my hand tools out of the cold dead fingers of my right. The last two tools he will wrest from my grasp will be my drawknife and my wooden spokeshave. I am so dependent on these two tools, that I am sure when that final moment comes, they will be in my hands.

Early records show that a drawknife and a spokeshave were in every woodworker's kit. In fact, these guys often owned more than one. Why? These are two of woodworking's most useful tools. Today's woodworkers will benefit as much from them as did the old guys. I am writing about the two tools together because that is how they are often used – together.

As its name implies, the drawknife is a knife that is used on the pull stroke. Using two hands provides a lot more control. Pull-

ing with arm, shoulder, back and leg muscles places a great deal of force behind the blade. An experienced user can slice a shaving as thick as his thumb, or cut one as fine as a human hair. This means a drawknife can accomplish quick stock removal, fine work and everything in between.

Old Tools Abound

The problem for today's woodworker is to find a good drawknife. Those sold in stores and catalogs will not generally work. The reason is simple. The tool is supposed to be a knife, but toolmakers insist on grinding their drawknives like a chisel. A 45° bezel won't work any better on a drawknife than it would on a pocketknife.

Happily, our predecessors bought scads of drawknives back when toolmakers still knew what they were doing, and many of them are still around. You should have no trouble finding a good knife on eBay or from old-tool dealer web sites. Look for one with tight handles, that has not been beat, or ground down to

nothing. Drawknives were made with cutting edges more than a foot long or as short as 4". An 8" to 10" knife is the right size for most work.

Get a Grip on your Drawknife

When choosing a knife, don't be tempted by the ones with folding handles. They look nice, but leave them for the collectors. The extra length created by the hinge places the handle too far away from the edge. You sacrifice control. Drop handles cause a similar problem. They lower your hands out of the plane of the cut, sacrificing power.

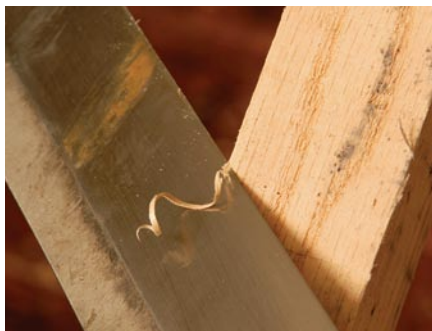
A drawknife's handles are misleading. They suggest that you hold a drawknife like you did the handle bars on your tricycle. In fact, how

Traditional tools. Drawknives and spokeshaves used to be standard in any toolbox – often in multiple sizes. And they're still useful today. As the name implies, the drawknife (pictured above) is used on the pull stroke. A spokeshave (shown at right) is usually pushed, but on straight-grained wood can be pulled.

you hold a knife is a function of the work, and a straight grip on the handles is only one of many possibilities. A drawknife is frequently used on end grain. Then, you have to choke up on the control handle (the right hand if you are right handed). Sometimes I hold the blade vertical, then my right hand holds the handle with an overhand grip. The important point is to not get locked into a misperception and be limited by it.

I tell students that a drawknife is a slicing tool, not a two-handled hatchet. This means you do not use it by hacking. My analogy is a butcher cutting meat. He starts close to the handle and makes a slicing stroke that ends with the point of the blade. The result is a clean, easy cut. So too with a drawknife. Start the cut close to your control hand. Lift the blade ever so slightly to create some clearance behind the cutting edge and to engage it. As you pull the knife, make a slicing cut that ends up at the far end of the blade. The closer you are to end grain, the shorter the radius of the slicing arc.

Besides an easy, glassy smooth cut, using the knife this way has other benefits. By slic-



A versatile tool. Taking a hair's breadth off a workpiece is quick work for a drawknife – as is heavy stock removal, and anything in between.

ing, you distribute the cutting action along the entire cutting edge, and it will stay sharp longer. Pulling directly toward yourself, or hacking as with a hatchet, places the wear all in one spot on the blade. This area becomes dull faster, and you will eventually develop a hollow in the cutting edge.

Once you understand how a drawknife cuts, you will understand the flaw behind a common misconception. Some woodworkers hold the knife upside down. This position – with the bezel down – changes the cutting



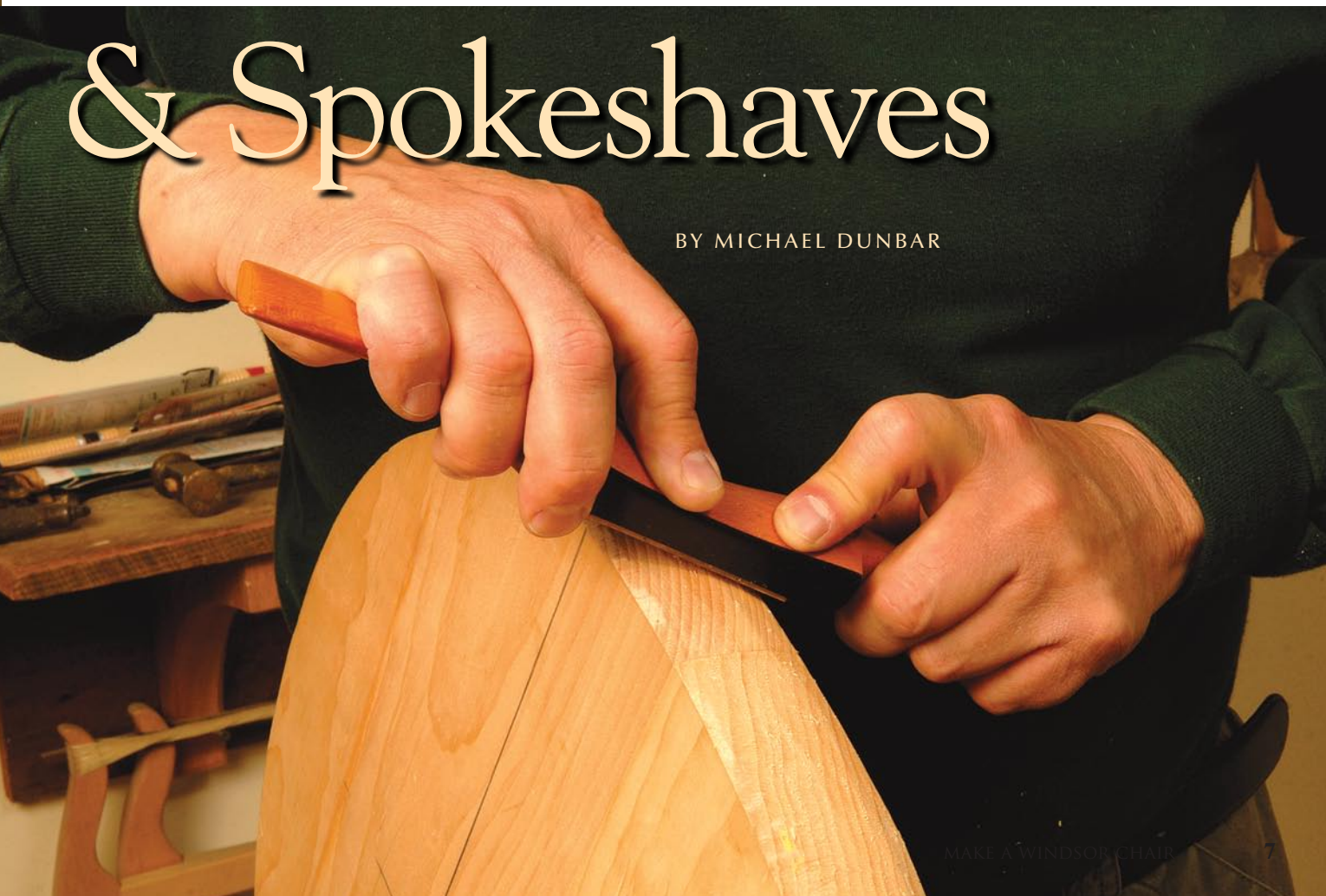
Bad grind. The modern drawknife on top in the picture above is ground with a chisel edge, which severely limits its usefulness. Look for one with a knife edge (they're easy to find on eBay and on old-tool web sites).

action. You have created a high-angle cut that will not slice. To better understand, imagine paring with a chisel. You place the bezel up, raise the handle slightly to create clearance, and cut with a slicing action. Consider what kind of cut you will get if you try to pare with the bezel down, and how much control you will have in this position.

The guys who use a drawknife this way argue they have more control. They mistake

& Spokeshaves

BY MICHAEL DUNBAR





Get a grip. There are many different ways to grip a drawknife, depending on your goal. How you hold the knife is a function of your work.

a limited cut for control. In accepting the limited cut they sacrifice the drawknife's most important feature: its ability to remove wood fast. Furthermore, the higher cutting angle will not cut as cleanly and it creates more friction, which dulls the edge faster. I liken using a drawknife upside down to training wheels on a bike. If you only know how to ride with training wheels, you mistake them for control because you don't fall. Better to take a few spills and learn how to really ride. Then, you truly have control.

Sharpening

A drawknife will eventually need to be sharpened. In fact, if you buy an old one, it will need some work before you can use it. Never grind a knife-edge tool. I sharpen my knives with sandpaper adhered to a wooden block. A drawknife edge is a special case, in that it is only one half a knife. The bottom of the blade is flat, as on a chisel-edge tool. That is where I begin. Hold the block, or the stone, flat on the surface and work back and forth. Be very careful not to raise the block, as this will round the edge, aggravating the very condition you are trying to correct.

Next, work the bezel, or upper surface of the edge. This surface is curved like your pocket knife. If you work only the cutting edge, you will gradually increase the angle and reduce the tool's ability to slice easily and cleanly. So while honing this surface, be sure to gradually lower the block so you are dressing the entire curve, rather than just the edge. In other words, do not just sharpen the blade. You also have to maintain the curve's original shape.

Work the lower surface and the upper curve through several grits. It is not neces-



Unclean cut. If you hold the knife upside down, the angle of the blade is higher and you're likely to get a crumpled shaving and rough surface.



Flat bottom. Although the blade should be ground with a knife edge, the back of the drawknife should be flat, like a chisel.



Dress all surfaces. Make sure you dress the entire curve on the front of the blade to maintain its original shape. Don't just dress the edge, or the angle will gradually increase.

sary to create an edge as sharp as on a chisel or plane blade, but it causes no harm.

A word of safety about drawknives: The tool has an open, unprotected cutting edge. I hang mine on a wall. This protects the tool and me. If you store the tool in a drawer or tool box, wrap or cover the edge. Otherwise, it can give you a real nasty bite when you reach in for the tool.

Spokeshave

The spokeshave usually cleans up after the drawknife and brings your work down to the line. The tool will create a finished surface, or one that requires only a light sanding. The difference in the two tools is that while the drawknife can also make fine cuts, the spokeshave cannot do heavy jobs. It is a lightweight tool intended for fine work.

When I use the term "spokeshave" I am referring to the type with a wooden body. While the metal-bodied version has the same name, it works in a very different way, and



Material difference. The difference is more than material between a wood-bodied and metal-bodied spokeshave. Notice the difference in cutting angles – when assembled, the wooden-body’s blade is close to parallel with the sole.

nowhere near as well. Take a minute to look at the two tools. The wooden shave’s cutter is close to parallel with the sole and the bezel is placed up. It is the same configuration as the drawknife. The metal version’s cutter is bedded at 45°, with its bezel down, in the same configuration as a plane and a drawknife used upside down. The wooden version’s cutting angle is much lower, making it a true shave. This lower cutting angle is the reason the tool works so well on end grain, and cuts so effortlessly with the grain.

While you may have to hunt to find a good drawknife, wooden-bodied spokeshaves are readily available. They are not mass produced and do not show up in catalogs. Rather, they are made by individual tool makers, and have to be purchased from their web sites. Most of these shaves are as good as any shaves made in the past. My shaves were all made by Dave Wachnicki of Dave’s Shaves.

There is another advantage in dealing with these individual makers. In the past, common-grade shaves were made of beech. Best grade were boxwood. Neither is a particularly pretty wood. Today’s shave makers work with highly figured woods, and their shaves can be spectacular. If you own a small piece of really special wood, they are happy to make it into a shave for you.

Materials Matter

Some catalogs sell low-angled shaves with metal bodies. I do not like these. Chatter is a spokeshave user’s biggest problem. A wooden body absorbs shock better than metal and reduces the tendency to chatter. I prefer to stick with wood.

Like drawknives, shaves were once part of every woodworker’s kit. Having a wooden body and a lightweight cutter, fewer of them have survived. Of those that have, a large percentage are worn out. Because shaves wear quickly, I strongly recommend you not use an old shave. Put it on display as an artifact, but spare it. You’ll be real happy with a new one.

While you can manage very well with just one drawknife, you will find that the more familiar you become with wooden shaves, the more of them you will want to own. I have about a dozen. It is more efficient to dedicate a shave for a certain job. The more jobs, the more shaves.

Spokeshave Setup

Unlike a drawknife, you have to set up a spokeshave. Most of today’s shaves have a top adjustment, which allows you to set the tool without removing the cutter. Adjustment is usually made by turning a small Allen screw. If not, you will have to examine the tool to see how it is adjusted. The trick in setup is to cock the blade so it is higher on one side than the other. In this configuration, you have every setting you need. When you want to take a very light cut, move to the shallow side of the blade. To

make a deep cut, move to the deep end. Much of your work will be done with the medium setting in the middle.

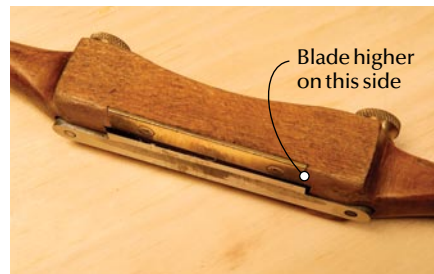
The drawknife is designed to be pulled. A spokeshave can be pushed or pulled, depending on the job. However, 90 percent of the time, the tool is pushed. The only time it can be effectively pulled is when whittling very straight-grained wood. An example would be Windsor chair spindles.

A shave is a very lightweight tool. Unlike a much heavier bench plane, gravity is not giving you any assistance. You provide all the force needed to engage the cutting edge. Without sufficient pressure, the tool will either skate or chatter. When pulling a shave, the tool is controlled by your wrists, and any downward pressure is provided by your shoulders, way out at the far ends of your extended arms. This is sufficient when whittling, as little weight is required to engage the cutting edge.

However, most of the work you do with a shave is shaping, which involves cutting across grain. In this case, the muscles involved in pulling a shave are inadequate. When you push a shave, you can apply weight from your upper body down onto the tool. It is your weight that keeps the edge engaged and cutting.



Multiples. It’s hard to stop at just one spokeshave; multiples allow you to dedicate specific tools to specific jobs.



Tricky setup. Set the blade so that it’s a bit higher on one side; that way, by moving the tool left and right, you have every setting you need without changing the tool’s setup.



Proper stroke. A spokeshave is, 90 percent of the time, used on the push stroke. However, if you have a straight-grained workpiece such as a chair spindle, it can be pulled effectively.

Proper Handling

Like the drawknife, the spokeshave's body seems to suggest you grip it in your hands by the handles. In reality, you pinch a spokeshave in the center of its stock with your fingers. The only difference in your grip when whittling and shaping is the position of your thumb. When pushing, place the thumb of your control hand low on the stock, close to the cutter. Your thumb provides forward force behind the cutter, while your shoulders provide weight over it. The result is a clean cut with little or no chatter.

A spokeshave's low cutting angle can make it a challenge for the first-time user to engage the cutting edge. Use this trick: Lay the tool on the flat of its blade. Rock it forward until it is now resting on its cutting edge and the sole's front corner. That's the placement. You're ready to cut.



In a pinch. The handles suggest that one grip the shave by the handles. However, more control is gained by pinching it in the center.



Cheap sharpening jig. A piece of sandpaper stuck on a small piece of wood is perfect for removing any rounding in the blade. But this is a time consuming method.

Like all other edge tools, a spokeshave works best when its cutter is slightly askew, rather than being worked straight on. When you work end grain, all the downward force you can muster still may not prevent chatter. Try increasing the amount of skew. If this doesn't work, try skewing the blade in the other direction. In woods with a pronounced difference in early and late wood, such as pine and oak, what appears as chatter may actually be washboarding. The edge cuts easily through the softer growth and rides up over the harder. Each pass makes the situation worse. When you skew the blade in the other direction you run the cutter across several layers of growth and the hard part of several annual rings is shaved along with the softer.

Sharpening

A spokeshave cutter is small, so it sharpens pretty readily. The problem is that being small, it's hard to hold. I start by lapping the flat bottom. Check the edge in good light to be sure



Hollow grind. Cutters with hollow-ground bottoms make sharpening fast – only two narrow strips of metal have to be dressed rather than the entire blade surface.

you have removed even the most microscopic rounding caused by wear. Now, hone the bezel. I use a piece of fine sandpaper adhered to a strip of wood about the size of a tongue depressor. The problem is to avoid changing the bezel angle with repeated honings.

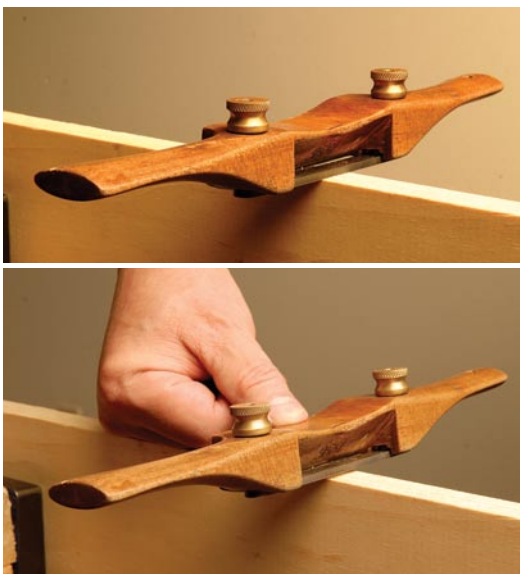
This is a lot of work to do with a small strip of wood. I recently acquired a Work Sharp. This system has made the process a piece of cake. It quickly flattens the cutter and dresses the bezel. I repeat the procedure through several papers and my shave will cut translucent end-grain shavings.

I have refitted most of my shaves with hollow ground cutters from Woodjoy Tools. These cutters have a hollow bottom that speeds up sharpening even more. I only have to flatten two narrow strips of steel, rather than the entire surface. **PW**

A chairmaker since 1971, Mike is the founder of The Windsor Institute in Hampton, N.H. For information on the school, and to read Mike's blog, visit thewindsorinstitute.com.



Work Sharp. A more expensive – but easier-to-handle – blade sharpening method is the Work Sharp.



Training. Set the shave flat on your work, then place your thumb in the curve to slightly increase the angle; that's the correct angle for use.

About Windsor Chairs

I published this article about Windsor Chairs in Early American Life magazine. Although written for people with a passion for antiques and period houses it is an important discussion of how Windsors developed during the mid-18th century. Much of it is drawn from my introduction to Windsors given at the beginning of every sack back class. Because the old makers designed around the color green Windsors present a new and challenging concept to 21st century woodworkers. In other words, the finish preceded the form and determined the form. That is the opposite of how we work. The piece also underscores why it is impossible to separate the form from its finish without undercutting your achievement. A stained Windsor shows off the grain (that the maker had nothing to do with) at the expense of the silhouette in line (that the maker had everything to do with.)

Windsor chairs are the greatest success story in the history of furniture. They so dominated the seating market in late colonial and early Federal America that nearly every home or public building was furnished with them. Their designs are captivating and their comfort and strength are legendary. For these reasons, they have remained popular for more than 200 years, and we continue to reproduce them today virtually unchanged. Countless antique Windsors that have survived two centuries of hard use are a staple of the antiques trade, and every good collection has some.

In their construction and in their design Windsors were very different from other chairs being made in early America. These differences were significant improvements in chairmaking and accounted for the unparalleled success of Windsors. The solid wood seat defines a Windsor: it allowed the chair to be divided into two separate and independent systems - the back and the undercarriage. Other chairs were constructed with two upright members that formed both the rear legs and back stiles. They also had a seat frame that had to be

filled with another material, such as upholstery or woven rush. These ever-present stiles created two strong verticals around which other chairmakers had to design.

Because the back was a separate structure in a Windsor, chairmakers were given the freedom to design chairs in entirely new ways. Secured to the seat, the back could be inclined at a comfortable sitting angle without becoming fragile. Rear legs could be canted back beyond the sitter's center of gravity, so the comfortably reclined back did not make the chair unstable. Nearly 2 in. thick, the seat could be deeply saddled to make it body conforming; a sitter was not aware of being on a solid wooden surface.

The seat also allowed chairmakers to engineer a much stronger chair. They joined the legs to the seat with cone-shaped tenons - a device known as a locking taper. The weight of a person sitting in a Windsor drove the conical tenons into the similarly shaped holes, causing them to lock. Instead of tearing a chair apart (as occurs in other chair styles) the act of sitting tightened a Windsor. These reliable leg joints allowed Windsor chairmakers to use their stretchers to push the legs apart rather than to hold them together. Putting the stretchers in compression rather than tension eliminated the problem of loose joints that needed continual regluing. Faceted and slightly over-sized tenons on hardwood spindles driven into holes in a softwood seat worked like a square peg in a round hole and held backs tightly together long after the glue had failed. All these new and different construction techniques resulted in chairs that still remain tight after 200 years.

Strength and comfort alone are enough to make any chair popular, Windsor design is what makes these chairs fascinating. In this way too, Windsors are different from other chairs and other furniture. Windsors are designed using the element of line. While very beautiful when viewed through a clear finish, the texture of wood grain is static. In contrast, line is dynamic; it engages your eye and draws it through a Windsor along the predetermined path of

its composition, much as the artist uses line in painting. As utilitarian chairs, Windsors were intended to be painted. This was the only finish that would hold up under rough use both indoors and out. Paint was the pre-condition that guided Windsor chairmakers to work in line and to view their chairs use linear compositions. Windsors are what they are because of their painted finish. There is an old explanation that Windsors are painted to cover up the different woods used to make them. This demeans the old guys' skill in that it regards the finish as an afterthought. This view is obviously mistaken and ignores the much more sophisticated accomplishment achieved by these craftsmen. Windsor design was the result of the chair's opaque finish and this remains the treatment that still allows us to appreciate the genius of these early makers. A natural finish on a Windsor distracts the eye with static wood grain and obscures what is truly great about these chairs - the use of line to pull the eye through its composition.

In her landmark study of Windsors, Nancy Goyne Evans suggests that Patrick Gordon was responsible for introducing Windsors from England to the North American colonies. Gordon was appointed governor of Pennsylvania in 1726, and on his death he owned five Windsor chairs. He had either brought the chairs with him or ordered them from England during his governorship. Of course Philadelphia's upper class wanted to copy the governor and commissioned similar chairs from local furniture makers.

We don't have Gordon's chairs, but we know what they looked like. His, and the early Windsors made for Philadelphia's elite were different from the later and more familiar sack back and bow back. Both Gordon's chairs and the first American Windsors were what their makers and owners would have called easy chairs, a term we still use to describe chairs we use for the same purpose (often a recliner.) Like our recliners 18th century easy chairs were large and commodious, and like our recliners occupied a designated space in a room. Our recliners are often placed in front of the television, while an 18th century Windsor easy chair may have been near a window or a fireplace. Today like then, one goes to an easy chair and sits rather than carrying an easy chair to another location. We don't usually drag our recliners around, just as people in the 18th century did not drag theirs. Like our recliners, 18th century easy chairs were generally owned as single pieces or as a pair, and like our recliners they were far more expensive than the everyday chairs found around the kitchen table.

Around 1770 there was an explosion in the

popularity of Windsors, which transformed the earlier, large and commodious easy chairs into the smaller sack backs and bow backs so familiar to us. One reason for this transformation from easy chair to everyday chair was the fashion for green-painted, wooden garden chairs then current with European upper classes. Mimicking their peers in Europe, American elites too wanted green chairs in their gardens. They chose Windsors (previously known only as easy chairs) for this purpose.

This new use as a garden chair sparked a number of important changes in Windsors design and in the way Windsors were made. To be used in the garden Windsors had to become portable. In response Windsors were scaled down to the size familiar to us. As opposed to a single easy chair, garden chairs are purchased in sets. It became common to buy Windsors by the dozen. Because people were buying large numbers of Windsors, production had to increase and prices had to decrease. Easy chair Windsors were expensive because they were made one at a time by general furniture makers. Craftsmen began to specialize as Windsor chairmakers. To lower costs and speed up production these guys pioneered the use of interchangeable parts and the division of labor - mass production techniques that in the next century would become cornerstones of the Industrial Revolution. They bought turnings from job turners. Journeymen and apprentices made the other parts, while the master assembled (framed) the chairs.

Using these new, faster production methods Philadelphia Windsor chairmakers were able to spit out chairs at a rate that quickly satisfied the local market. They began to export, shipping Windsors to cities up and down the Eastern Seaboard and to Caribbean and South American ports as well. Wherever they arrived Windsors found a ready market. Rather than lose work to chairmakers in far-off Philadelphia local craftsmen copied the imported chairs and entered the business of Windsor chairmaking. Soon chairmakers in other port cities were exporting and competing with chairmakers in Philadelphia. They also copied the Philadelphia custom of painting their work green; this color was so common that for the rest of the 18th century "green chairs" was the familiar term for Windsors.

The new, smaller Windsors moved indoors and became popular for everyday seating from the most elegant mansion to the humblest cottage. They were also used to furnish public buildings. They appear in almost every household probate inventory of the period and show up repeatedly in the visual record. Perhaps the most famous example is Robert Pine's circa 1785 painting of the Continental Congress

voting to approve independence. It shows the delegates seated in sack backs and bow back side chairs.

It is a common misconception that Windsors were a country chair. Windsors were predominantly the product of urban specialists. A city or large town boasted numerous chair shops producing these chairs in prodigious quantities. Chairmakers working in any particular city tended to make chairs that were similar - a phenomenon that is called regional characteristics. This is understandable: many chair shops purchased legs and stretchers from the same turners. Journeymen worked in one shop one year and in another the next, spreading new ideas and new patterns to all the shops in a city.

Antique collecting was sparked by the Centennial celebration in 1876. Collectors quickly became fascinated with these solid, comfortable, 100 year-old painted chairs.

As the only people interested in Windsors, collectors were on their own to name the various styles. As a result, there was no standardization: the same term is frequently used for distinctly different chairs, or different collectors call the same style different names.

In 1917, Wallace Nutting made the first serious attempt to catalog Windsors in his seminal work, *A Windsor Handbook*. Nutting distinguished Windsors by type and attempted to date the various styles and grade individual chairs by "merit". His book had both good and bad consequences. Collector interest in Windsors thrived and many old Windsors that would have otherwise perished were saved. However, Nutting put into print many old wives tales, which are still repeated without question.

Also, Nutting's eccentric tastes (rather than the design sense of the original makers) became the standard by which Windsors were, and still are rated. Unfortunately, many of today's Windsor chairmakers draw on Nutting for inspiration rather than 18th century chairs. Nutting liked chairs that were exaggerated, with thick turnings, wide splay, high backs, and deep seats. He owned a furniture factory and made reproduction Windsors to match his strange ideal. As a result, his chairs are very different from the originals and can be recognized on sight.

In his book Nutting lamented that he had never found the ideal antique Windsor. This is not surprising, as no self-respecting 18th century chairmaker would have made such a chair. They would have considered the Nutting ideal a monstrosity. They would have thought the same of Windsors made today by chairmakers drawing on Nutting for inspiration. The old guys understand (Nutting did not)

that a successful composition in line is not possible if individual parts are not all in the same scale; none calling attention to itself and each contributing to the chair's overall success. For this reason, 18th century Windsors are more formalized and restrained than Nutting understood. They are more formalized and restrained than many modern makers understand.

Two influences have been added to the Windsor story in the past 30 years. Windsors caught the attention of furniture historians and scholars and at last, are being studied in a formal and systematic manner. As a result, more is known about Windsors than ever before. About the same time, the craft of Windsor chairmaking was revived, and today the country boasts hundreds of Windsor chairmakers working by hand and producing chairs very much the same as the originals. Usually, these chairs are as well made as the originals. Regrettably, they are not always as well designed.

Chapter Four

Rod Back Windsor



ASSEMBLY NOTES

Make all the individual parts before attempting any assembly. Bend the crest rail first so that it has sufficient time to dry before being incorporated into the chair. It is small enough so that it can be plasticised by boiling it rather than using a steam box. Use a wide flat roasting pan and boil the water on the stove top. I generally make the seat next. The original is white pine, but any easily worked soft wood is suitable. If perfectly clear lumber of this dimension is difficult to find the width can be glued up in several sections.

The spindles of the original chair were turned. However, pieces this thin whip considerably and one who is not a skilled turner will have trouble with them. In this case it is better to whittle the spindles with a draw knife and spoke shave, finishing off with a scraper. An extra inch or two should be left to aid in assembly. This can be shaved off when the chair is completed. The turnings should present no problems to even a beginning turner. However, rather than ripping expensive hardwood stock on a table saw billets can be obtained more cheaply by riving (or splitting) from the actual log. A complete discussion of this technique is included in my book.

Before beginning assembly drill all holes in the seat. This was originally done by eye which resulted in a chair which was subtly asymmetrical. Also, this technique required years of practice and considerable skill. You will probably want to make a jig by drilling a hole through a block of wood and using this as a guide for the drill bit or by checking with a bevel square.

The base of the chair must be assembled before the back. Begin by drilling the sockets in the side stretchers and join them to the central member. Glue, no matter which variety you prefer, should be swabbed on the joint. Next, the legs are mounted on the stretchers. Finally, the four leg tenons are inserted into the seat sockets and tapped into place with a mallet. When this part of the assembly is completed wedges are driven into the exposed ends of the tenons at right angles to the grain to avoid splitting the seat. Finally the exposed ends of the tenons are chiseled flush.

To assemble the back drill the holes in the stiles for the crest. Then place the unit into the chair. Insert the spindles in their seat sockets and fan them out across the crest rail. Their holes can be located by eye or by walking them off with a pair of dividers. Now drill the six holes. Make a dry run before final assembly to make sure that everything is correct. Then assemble for the last time swabbing all joints with glue and wedging the tops of the spindles and the bottoms of the stiles. Then, all joints are shaved flush.

The chair is now complete and ready for finishing. The original was painted black. The colored surface covered the varied woods and accentuated the lines of the chair rather than the grain. However, if you wish to do your chair in a natural finish remember that a tremendous amount of time is required to rub down all those spindles and turnings. Therefore, I recommend a linseed or tung oil finish which can be wiped on.

MATERIALS

1 piece pine or other suitable soft wood 16" x 17" x 2"

6 pieces ash, oak or hickory $\frac{3}{4}$ " x $\frac{3}{4}$ " x 18"

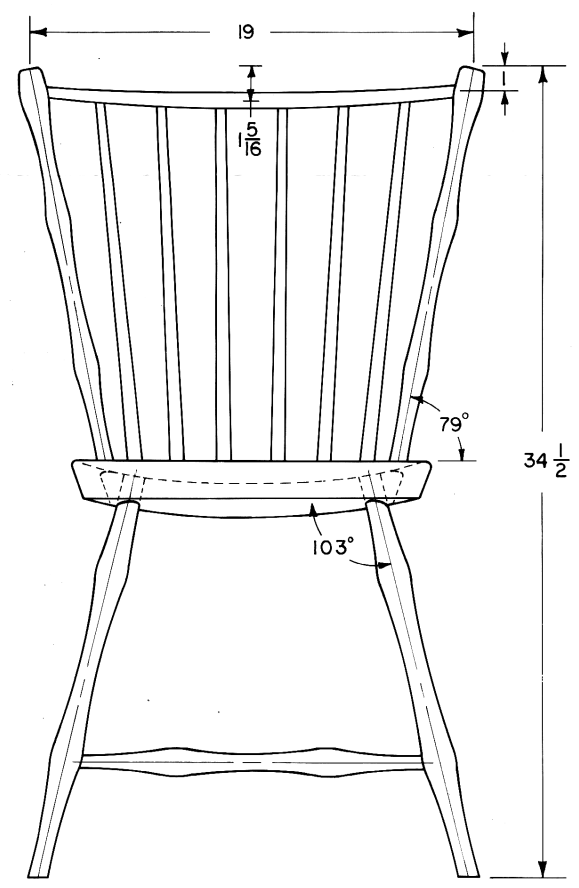
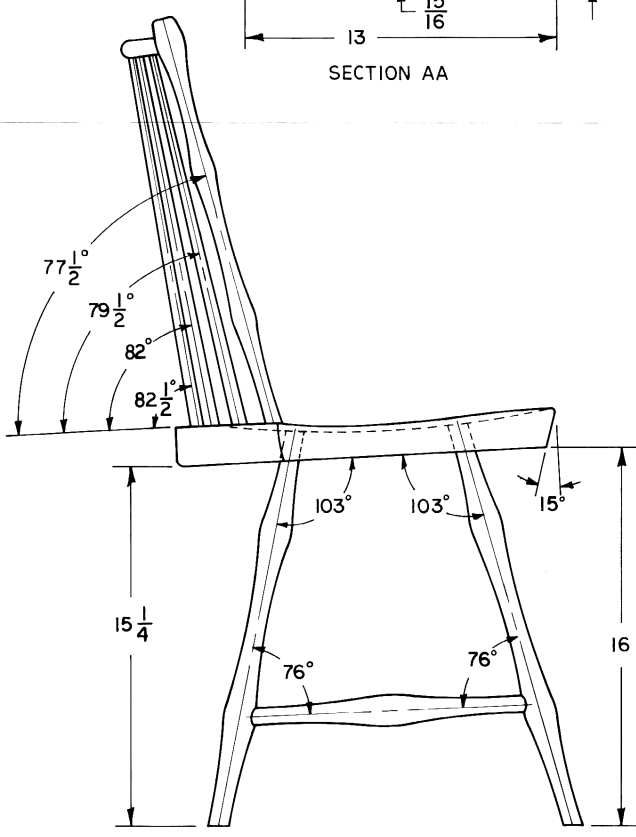
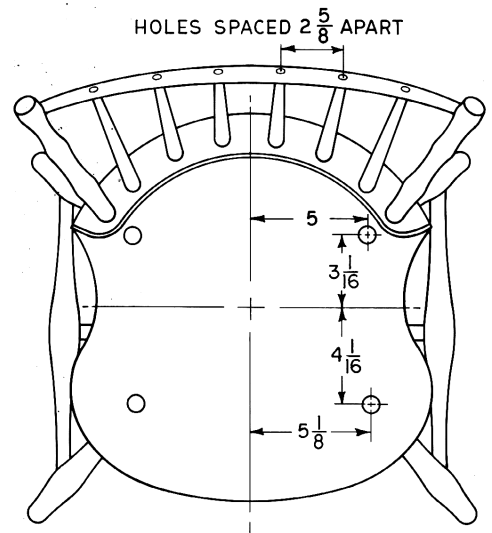
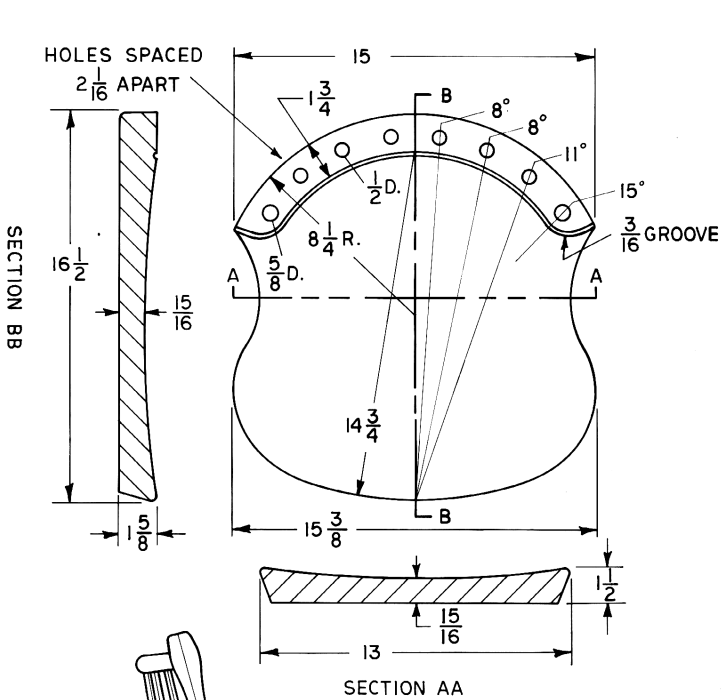
1 piece ash, oak hickory $\frac{3}{4}$ " x $\frac{3}{4}$ " x 21"

4 billets maple, birch or cherry 1½" x 1½" x 19"

2 billets maple, birch or cherry 1½" x 1½" x 14"

1 billet maple, birch or cherry 1½" x 1½" x 17"

2 billets maple, birch or cherry 5/4 x 5/4 x 21"



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Chapter Five

Boston Rocker



ASSEMBLY NOTES

Make all the individual pieces before attempting any assembly. It is best to begin with the bent parts (stiles, spindles and crest) so that the steamed wood has sufficient time to dry before being incorporated into the chair. I generally make the seat next. The original is white pine. If this species or any other sufficiently wide softwood is not available the width can be glued up. The bold scroll shaped seat is only made possible by first gluing two sections in the back to obtain the necessary height as well as another narrow piece across the bottom front. Glue up this assembly as a unit before doing any shaping. There is also a thin strip glued to the back of the crest.

The spindles of the original chair were turned. However, pieces this thin whip considerably and one who is not a skilled turner will have trouble with them. They can be whittled with a draw knife and spoke shave and finished with a scraper as an alternate technique. The rest of the turnings should present no problems.

Drill all holes in the seat. This was originally done by eye and resulted in a chair that was subtly asymmetrical. However, this technique required years of practice. You will probably want to make a jig by

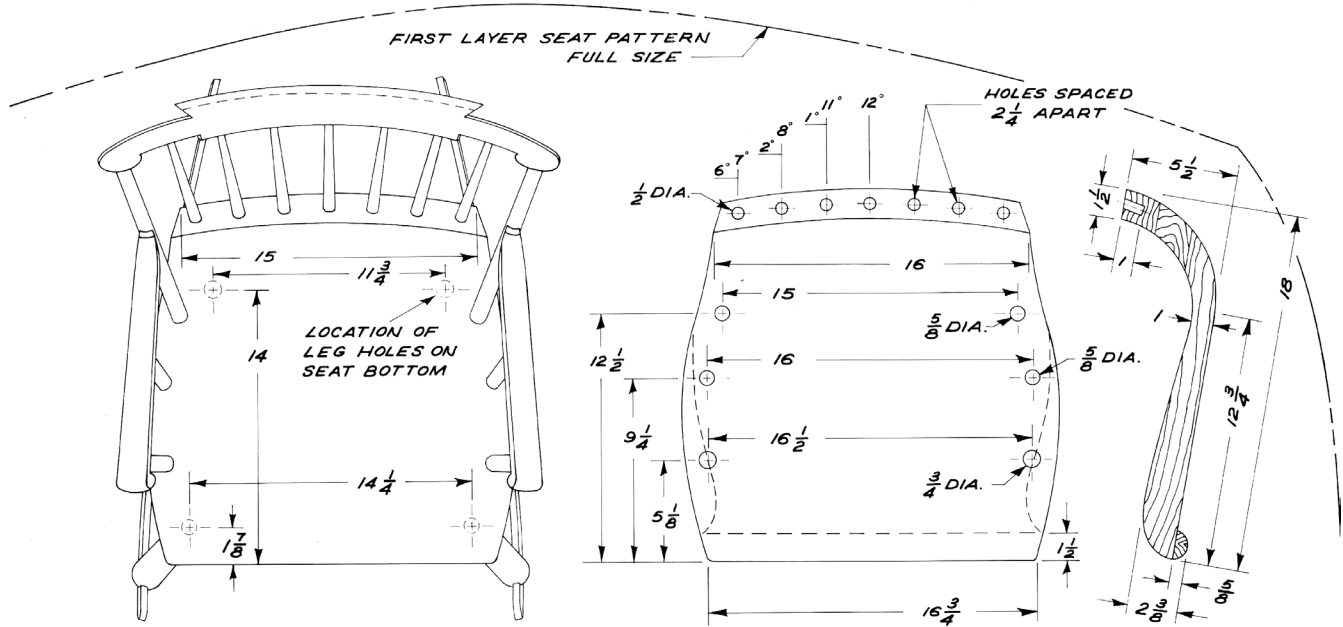
drilling a hole through a block of wood at the necessary angle and using this for a guide or by checking with a bevel square. The base of the chair must be assembled before the back. First drill the sockets for the side stretchers into the legs. When the legs are mounted into their seat sockets it will be easy to locate the sockets for the front and rear stretchers. Once all sockets are drilled swab each with glue and assemble. Make sure the rockers fit but do not mount them as yet. This will make the chair unstable when assembling the back.

Next, assemble the back without the arms. Wedge the bottom of the stiles and pin the stile tenons into the crest. It is not necessary to pin the spindles. Now, add the arms. Use a dowel joint or a wood screw where it meets the stile. Wedge the arm stump from underneath the seat. The chair is now complete and it is time to mount the rockers. Use a hardwood pin to prevent them from pulling loose.

The chair is ready for finishing. This style of rocker evolved with an elaborate decorated surface and a natural finish is not really appropriate. A number of books are available on the subject of chair decoration and these usually contain a selection of Boston Rocker patterns and information on false rosewood graining.

MATERIALS

- 1 piece pine or other suitable softwood 17" x 20" x 2"
- 2 pieces pine or other suitable softwood 17" x 2¼" x 2"
- 1 piece pine or other suitable softwood 17" x 1½" x ¾"
- 2 pieces oak 3½" x ½" x 27"
- 7 pieces maple or birch ¾" x ¾" x 23"
- 3 pieces maple or birch ¾" x ¾" x 15"
- 4 pieces maple or birch 2" x 2" x 14"
- 1 piece maple or birch 5/4 x 5/4 x 17"
- 2 pieces maple or birch ¾" x ¾" x 11"
- 2 pieces maple or birch 1" x 1" x 12"
- 2 pieces maple or birch 2" x 2" x 14"
- 1 piece maple or birch ¾" x 7" x 25"
- 1 strip maple or birch ⅜" x ⅝" x 17"

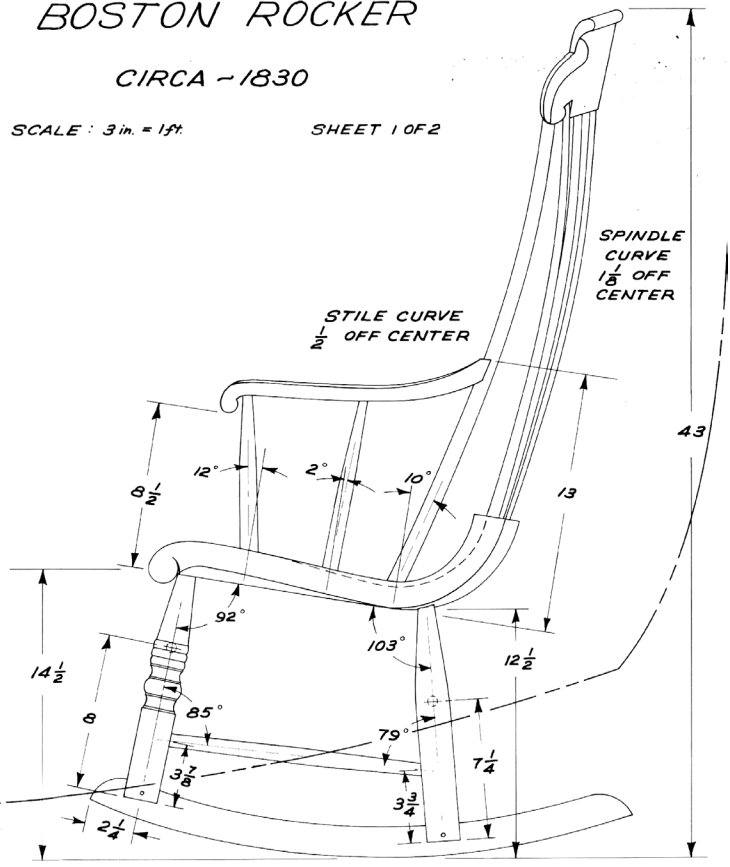
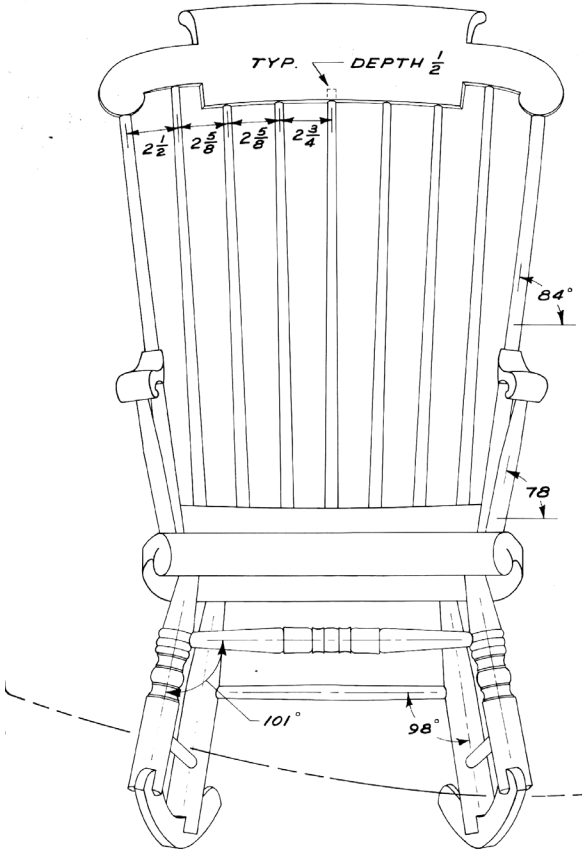


BOSTON ROCKER

CIRCA - 1830

SCALE : 3 in. = 1 ft.

SHEET 1 OF 2



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FULL/SCALED DIMENSIONS NOT ACCURATE
DUE TO PLAN SIZE REDUCTION

Chapter Six

Loop Back Windsor



ASSEMBLY NOTES

This loop back is the perfect companion side chair for the continuous arm. An ideal set is two arms and four sides. On both designs the braced back was an option chairmakers could use. You can either include it or not and for that reason it is shown in dotted lines. If you are planning a set you will probably want to be consistent.

Begin the project by making all the individual parts. It is best to first bend the back so that the steamed wood has sufficient time to dry. I generally make the seat next. Depending on your location, perfectly clear softwood of sufficient width can be difficult to find. If necessary the stock can be glued up.

You will probably want to whittle your spindles with a spokeshave and a draw knife as such a thin length whips uncontrollably in the lathe. Although the spindles vary in length the difference occurs in the top end. For this reason the longest length is shown in the drawing. In making the spindles take their lengths from the front view and when fashioning them reduce each from the top and not the bottom. It is best to leave an extra inch or two in excess of the final length to aid in the assembly. The residue is trimmed after the chair back has been assembled.

The turnings will be no problem to anyone with lathe experience. However, rather than ripping expensive two inch hardwood stock on a table saw billets can be obtained much more cheaply by riving (or splitting) from the log. A complete discussion of this technique is included in my book. The original chair was assembled using tapered sockets and tenons in the seat. In this way should the leg joints loosen the weight of a person sitting in the chair automatically tightened them. However, this detail is difficult to execute and as a result shouldered tenons of a single diameter are shown as an optional construction detail.

Before beginning assembly drill all holes in the seat. This was originally done by eye which resulted in a chair which was subtly asymmetrical. But, this technique required years of practice and considerable skill. You will probably want to make a jig by drilling a hole through a block of wood and using this as a guide for the drill bit. Or, you can check your angle with a bevel square.

The base of the chair must be assembled before the back. Begin by drilling the sockets in the side stretchers and joining them to the central member. Glue, no matter which variety you prefer, should be swabbed on the joint. Next, the legs are mounted on the stretchers. Finally, the four leg tenons are inserted into the seat sockets and are tapped into place with a mallet. Once this part of the assembly is completed wedges are driven into the exposed ends of the tenons at right angles to the grain to avoid splitting the seat. Finally, the exposed ends of the tenons are chiseled flush.

The back is the most difficult part. Begin by cutting your tenons on the ends of the bow and chop the corresponding mortices. Now set the bow in place and fan the spindles out across it. You can now find the center and walk the sockets off with a pair of dividers. When all holes have been drilled swab them with glue and assemble. All the joints in the bow are secured with fox tail wedges and are then shaved flush.

The chair is now ready for finishing. The original was painted green. The colored surface covered the varied woods and accentuated the lines of the chair rather than the grain. I have been very pleased with the results obtained from milk paint. However, if you wish to do your chair in a natural finish remember that a great deal of time is required to rub down all those spindles and turnings. Therefore, I recommend a linseed or tung oil finish which can be wiped on.

MATERIALS

1 piece pine or other suitable soft wood 18" X 17" X 7/4 (add 3" of length with brace)

9 pieces ash, oak or hickory 3/4" X 3/4" X 22" (add 2" with rear spindles)

4 billets maple, cherry or birch 2" X 2" X 18"

2 billets maple, cherry or birch 2" X 2" X 15"

1 billet maple, cherry or birch 2" X 2" X 11"

1 length of straight grained ash, oak or hickory 1" X 1" X 58"

Chapter Seven

Bow Back Windsor



ASSEMBLY NOTES

Begin by making all the individual parts before attempting any assembly. It is best to first bend the arm and bow so that the steamed wood has sufficient time to dry before being incorporated into the chair. If desired the scrolled hand on the arm can be glued on after the arm is bent. This way if the part breaks the time and effort required to shape the hand is not wasted. Also, this method allows a more narrow length of wood to be used for the arm. The measurements necessary for making the bending form

are included on the lower right hand corner of page 2. The same form is used for the arm and bow. I generally make the seat next. Clear softwood 16" wide by 2" thick can be difficult to find. If necessary a blank can be glued up from several pieces.

The spindles of the original chair were whittled. You will probably want to also make them in this way since such thin pieces whip in the lathe. Use a draw knife and spoke shave, finishing with a scraper. It is best to leave a little extra length to aid in the assembly. This remainder is cut off once

the back is together. The turnings should present no problems to anyone who is acquainted with lathe work. However, rather than ripping extensive hardwood stock on a table saw billets can be obtained more easily and more cheaply by riving (or splitting) from the actual log. A complete discussion of this technique is included in the book.

Before beginning assembly drill all holes in the seat. This was originally done by eye which resulted in a chair that was subtly asymmetrical. But, this technique required years of practice and considerable skill. You will probably want to make a jig by drilling a hole through a block of wood at the necessary angle and using this as a guide for the drill bit or by checking with a bevel square.

The base of the chair must be assembled before the back. Begin by drilling the sockets in the side stretchers and joining them to the central member. Glue, no matter which variety you prefer, should be swabbed on the joint. Next, the legs are mounted on the stretchers. Finally, the four leg tenons are inserted into the seat sockets and are tapped into place with a mallet. When this part of the assembly is completed wedges are driven into the exposed ends of the tenons at right angles to the grain to avoid splitting the seat. Finally, the exposed ends of the tenons are chiseled flush.

The back is the most difficult part. First, drill the sockets for the arm stumps in the unbent arm and set the piece onto the chair. This way the spindles can be inserted into their seat sockets and then fanned out across the arm. This allows you to find the center from which the remaining sockets can be walked off with a pair of dividers. These holes are

drilled without the aid of a jig. Clamp the arm to the work bench top and before drilling check the angle of each. When all are drilled swab all the seat sockets with glue as well as those for the stump tenons and short spindles where they join the arm. Do not glue the holes for the long spindles. Next, wedge the top and bottom of the stumps and the tops of the short spindles and shave flush.

Before adding the bow drill the two sockets where it is joined to the arm. Insert the ends into these holes so it is held in place. The spindles should fairly well locate themselves along the bend of the bow. It is difficult to drill these holes off the chair. I weave the spindles alternately one inside the bow, the next out, the next in, etc. This gives the bow support while drilling the first socket. Start with that for the center spindle. As each is drilled take the bow off the chair and tap it down over the corresponding spindle. In this way the bow becomes more secure as each socket is drilled through it. When all are completed swab glue in each socket as well as the two in the arm rail and assemble. Wedge the top of each spindle as well as the ends of the bow and shave flush.

The chair is now complete and ready for finishing. The original was painted green. The colored surface covered the variety of woods and accentuated the lines of the chair rather than the grain. However, if you wish to do your chair in a natural finish remember that a tremendous amount of time is required to rub down all those spindles and turnings. Therefore, I recommend a linseed or tung oil finish which can be wiped on.

MATERIALS

- 1 piece pine or other suitable softwood 16" x 20" x 2"
- 7 pieces ash, oak or hickory $\frac{3}{4}$ " x $\frac{3}{4}$ " x 23"
- 5 billets maple, birch or cherry 1 $\frac{1}{2}$ " x 1 $\frac{1}{2}$ " x 18"
- 2 billets maple, birch or cherry 1 $\frac{3}{4}$ " x 1 $\frac{3}{4}$ " x 13"
- 2 billets maple, birch or cherry 1 $\frac{1}{4}$ " x 1 $\frac{1}{4}$ " x 14"
- 4 pieces maple, birch or cherry $\frac{3}{4}$ " x $\frac{3}{4}$ " x 11"
- 1 length of straight grained ash, oak or hickory 2" x $\frac{3}{4}$ " x 45"
- 1 length of straight grained ash, oak or hickory $\frac{3}{4}$ " x $\frac{3}{4}$ " x 43"

Chapter Eight

Windsor Settee



ASSEMBLY NOTES

This bench, or settee, was made by John Hubbard, a nineteenth century Windsor chairmaker who worked in Boston. It was one of a set he made for the Middlesex County (Massachusetts) Superior Court House when it was renovated and refurnished in 1848. The bench is an excellent example of how early American furniture makers solved problems. It also shows that there is nothing new under the sun. In reality it is a piece of modular or sectional furniture, a concept which is currently all the rage. Consider each pair of legs as a section. By adding to (or subtracting from) the number of legs Hubbard used you can make a bench as short as 53" or, as long as you wish. Your only limitation is the length of seat material you can find. The original seat is 98" long.

To determine how long your bench will be first consider the drawing. It shows one end of the bench

up to and including the second set of legs. If you wish to make a bench that is 53" long (comfortable for up to three people) simply regard the center line of the inner pair of legs as the exact middle of the bench. The other half is no more than a mirror image of the drawing. Additional sections are 22" long, the distance from center to center of each pair of legs. If you wish to make an eight legger add 22" to 53" for a total seat length of 75³/₄". To make a ten legger as did Hubbard add 22" twice, or 45" to 53" for a total of 98¹/₄". Any greater length is figured by the same formula.

Once you have decided on the length, make the seat. If you have any difficulty finding pine 16" wide by 1³/₄" thick (it hand planes to the required 1⁵/₈") the seat stock can be glued up. Next, turn the legs. Neither these nor any of the other turnings should present any problems to even a beginning turner. Be careful to size your tenons exactly. The sockets

do not pierce the seat and you cannot tighten the joints with wedges. Rather than rip your stock from expensive hardwood you might prefer to obtain it through a process called riving, or splitting directly from the log. A complete discussion of this appears in the book.

Drill your leg sockets and put the legs in place. A stretcher length of $21\frac{3}{16}$ " is given. But depending on how accurately you are able to reproduce your angles, the stretchers for your own project might need to vary slightly. Therefore, it is probably better to measure from your project than to be slavishly devoted to the drawing. Now, turn the stretchers to their individual lengths. The tenons shown are 1" long. This length is needed for a strong joint. However, in the case of the inner legs the stretchers butt each other inside a through socket. Therefore, the combined length of 2" is not possible inside a leg only $1\frac{5}{8}$ " thick. You will have to trim the tenons sufficiently when they meet inside a through socket. Otherwise, use the 1" tenons for all side stretchers as well as the tenons on the front and back stretchers that are joined to an end leg.

When all your sockets are drilled, assemble the base. If you are at all hesitant do a dry trial run. When you are satisfied with the fit glue and assemble for the final time.

Next, make the parts for the back. The arms on the original are mahogany, but if you wish, you can substitute a native hardwood such as cherry. You will have to determine the number of spindles you will need depending on your seat length. The typical distance between spindle sockets in the back of

the seat is $3\frac{1}{2}$ ". However, walk off the sockets with a pair of dividers until you come out even. You may have to adjust this distance slightly for your own individual project.

Wait until the base is assembled before drilling the sockets for the back. (This is assuming you are using a hand brace and not a drill press.) This way the stability of the assembled base and the ability to sight down the brace aid in achieving more accurate angles of such sockets as those needed for the sump and stile tenons. If cutting the mortice or tenon where the arm meets the stile gives you trouble the joint can be made with a wood screw. Now assemble. Once again, a trial run is recommended. Also, more than one set of hands is helpful for a long bench. Once the back has been put together secure the bottoms of the stumps and stiles with wedges.

The original bench was finished with a paint process called false graining. This technique simulated rosewood and perhaps was done to relieve the somber and serious atmosphere of a court room. If you wish to try your hand at graining the tools are available at most paint stores. Use a flat red base with a flat black over coat and seal with varnish. Or, you can paint the bench a solid color and highlight the ring turnings with yellow. Either finish is equally authentic. I have been very happy with the results obtained from milk paint. If you decide you want the natural wood I recommend either linseed or tung oil sealed with wax since these can be wiped on. Shellac or varnish need to be rubbed which is a great deal of work considering all the tight spots on the bench.

MATERIALS

Pine or other suitable softwood $1\frac{3}{4}$ " X 16" X however long you wish to make the bench.

Maple or birch 1" X $3\frac{1}{2}$ " X the same length as above - crest, one piece.

Mahogany 2" X 17" X $3\frac{1}{2}$ " - arms, two pieces.

Maple or birch $1\frac{1}{2}$ " X $1\frac{1}{2}$ " X 12" - arm stumps, two pieces.

Maple or birch $1\frac{1}{2}$ " X $1\frac{1}{2}$ " X $17\frac{1}{2}$ " - stiles, two pieces.

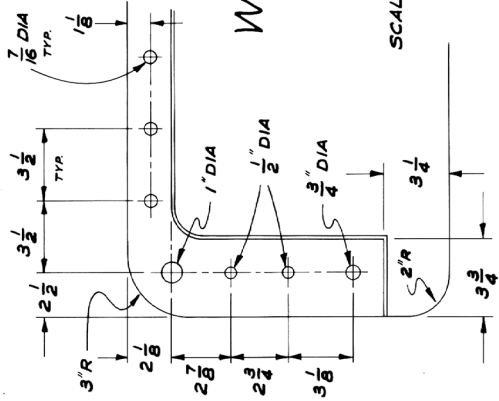
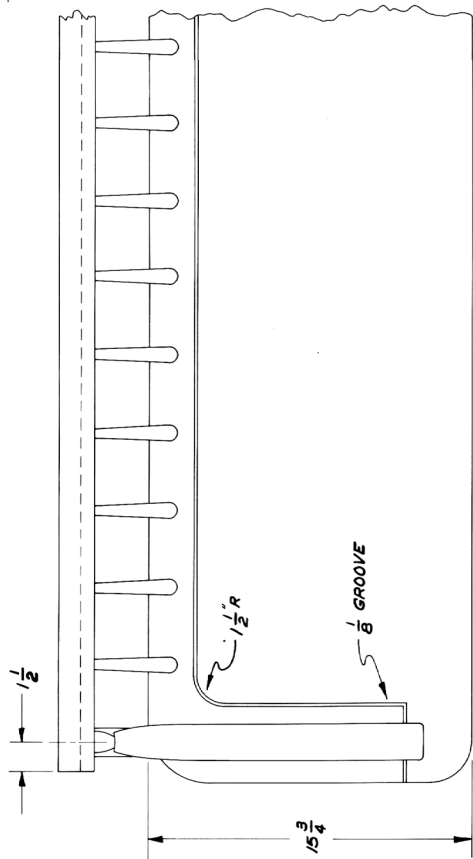
Maple or birch $\frac{3}{4}$ " X $\frac{3}{4}$ " X 11" - short spindles, four pieces.

Maple or birch $1\frac{3}{4}$ " X $1\frac{3}{4}$ " X 17" - legs, at least six, more depending on length of bench.

Maple or birch $\frac{3}{4}$ " X $\frac{3}{4}$ " X 17" - side stretchers, one for every pair of legs.

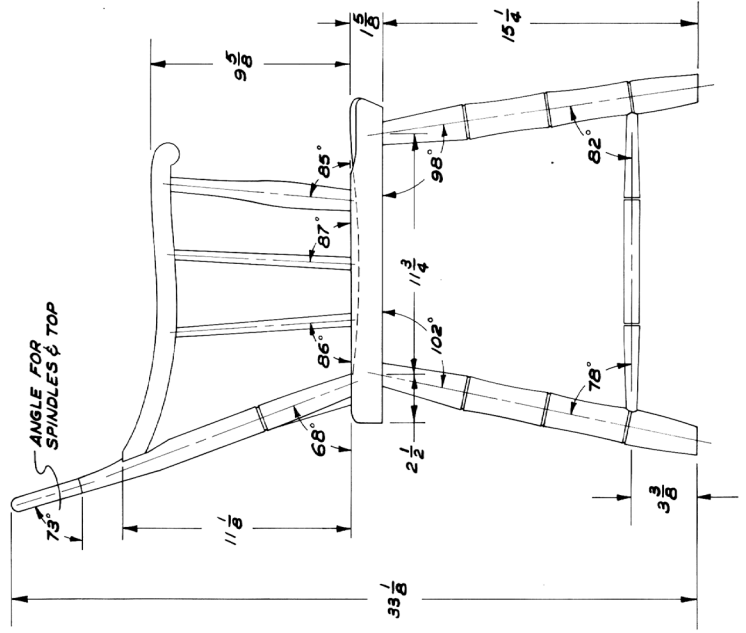
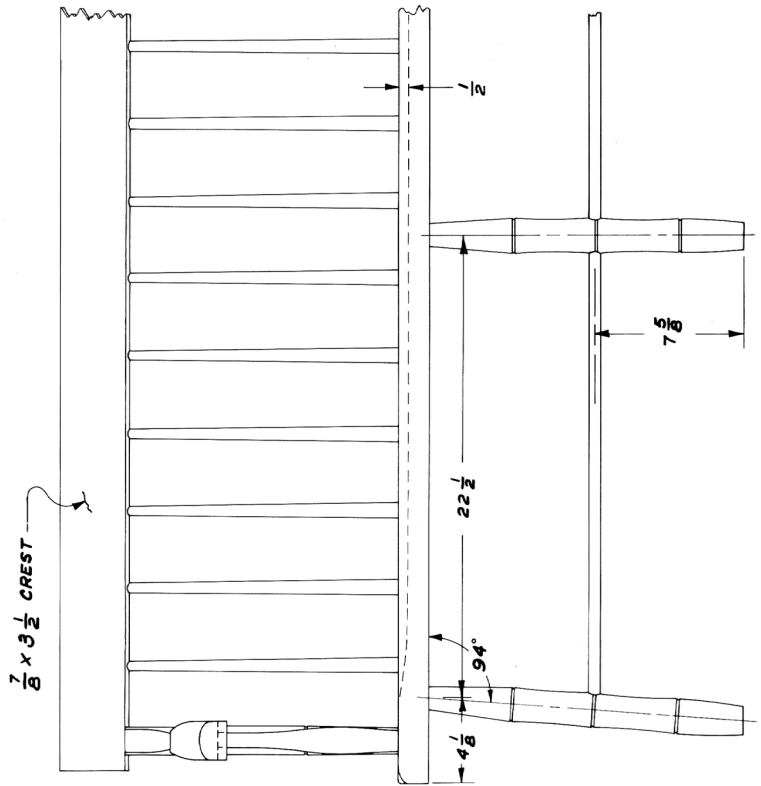
Maple or birch $\frac{3}{4}$ " X $\frac{3}{4}$ " X 24" - front and back stretchers, four for a six legged bench, two more for each additional pair of legs.

Maple or birch 1" X 1" X 16" - long spindles, see Paragraph #6.



WINDSOR SETTEE
CIRCA 1848

SCALE: 3 in. = 1 ft. SHEET 1 of 2



Chapter Nine

Photos: Splitting Logs





Photos: Fan Back Class



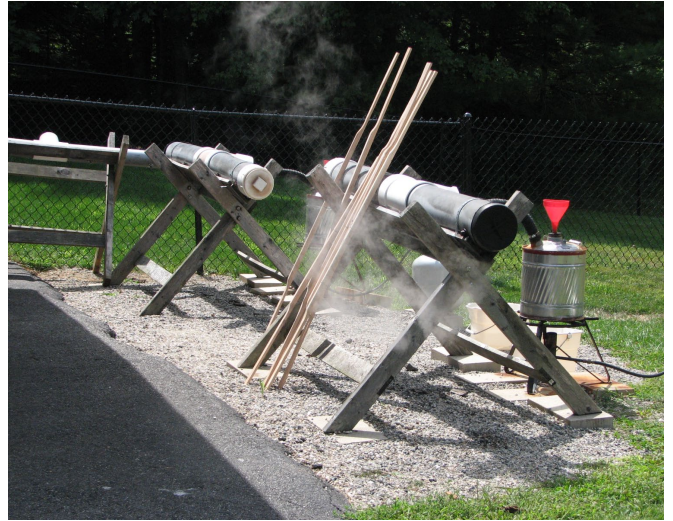


Photos: Fan Back Class (cont.)





Photos: C-Arm Class





Photos: C-Arm Class (cont.)

