



JOINER'S WORK

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Table of Contents



<i>Introduction</i>	<i>xii</i>
<i>Chapter 1: Materials</i>	<i>2</i>
<i>Chapter 2: In the Shop</i>	<i>28</i>
<i>Chapter 3: Carved Decoration</i>	<i>38</i>
<i>Chapter 4: Carved Boxes</i>	<i>86</i>
<i>Chapter 5: Box with a Drawer</i>	<i>118</i>
<i>Chapter 6: Desk Box</i>	<i>134</i>
<i>Chapter 7: Joined Chest</i>	<i>144</i>
<i>Chapter 8: Chest Variations</i>	<i>212</i>
<i>Chapter 9: Bookstand</i>	<i>228</i>
<i>Chapter 10: Finishing Touches</i>	<i>234</i>
<i>Conclusion</i>	<i>240</i>
<i>Bibliography</i>	<i>243</i>





❁ Dedication ❁

Looking back at 40 years of woodworking, I can see it all clearly now. There's no simpler way to put it: Without John (Jennie) Alexander (1930-2018), I would not have become a woodworker, nor donned any of the other hats I sometimes have worn – museum professional, workshop instructor, writer, researcher etc. We had a great run together, drove each other to distraction and pushed each other further along our chosen path. JA's death in 2018 came 40 years after the publication of "Make a Chair from a Tree," the book that brought us together. Every day in my shop, JA is there – in the tools, techniques, books, ideas (both the ones that worked and those that didn't). With all the love and respect I can muster, I dedicate this book to the unforgettable memory of John (Jennie) Alexander.

Photo courtesy of Jennie Alexander's estate.



Acknowledgements

I'm getting quicker at writing books. The joint stool book I wrote with Jennie Alexander took 20 years; this one, about only eight years. I still require a great deal of help; learning joinery from dead people takes some head-scratching. Through the years, I've had a great many generous friends and colleagues help me on my way. Inevitably, someone gets left off a list like this; I apologize in advance for any omissions.

Again, Robert Trent gets top billing. The leading scholar of 17th-century New England furniture, Trent taught me so much over the years; it still goes on. I've had the tremendous fortune of being welcomed into museums and private collections to study period objects in detail. Without that access, my furniture would look nothing like it does. Thanks to: Winterthur Museum and Gardens; Historic New England; the Museum of Fine Arts, Boston; the Metropolitan Museum of Art; Plimoth Plantation; the Chipstone Foundation; Colonial Williamsburg Foundation; Smithsonian Institution; the Regional

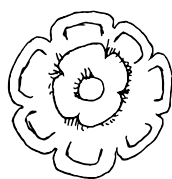
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I would also like to thank all the students who sign up for workshops and classes, and customers for my work. Without them I'd have to get a real job. Likewise the readers of my blog, "Joiner's Notes." Since 2008, I've been jotting down my thoughts, research, photos and more, and have been appreciative of the support I've received from the readers. Special thanks to Mark Anderson, Gavin Ashworth, Mark Atchison, Luke Beckerdite, Stuart Bolton, Al Breed, Curtis Buchanan, Susan Buck, Michael Burrey, Nancy Carlisle, Dennis Carr, Jan and Victor Chinnery, Edward S. Cooke Jr., Bill Coperthwaite, Abbott Lowell

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To Maureen, my wife, and our kids, Rose and Daniel, my thanks for your tolerance while I scatter wood chips all over the house.





Introduction

For 20 years, I had my joiner's shop in a living history museum, where, while working at the bench, I answered questions for a living about wood, furniture, tools, history and more. Some questions were just for amusement, but I'm not sure whose.

"How long does that take?" "Is that beard real?" "At night do you get out the table saw?" ("It depends," "yes" and "no" are the answers there.) One visitor said he'd love to see a book about all the different joints I use. I told him it'd be a pretty short book. The first page would be the mortise and tenon, the second would be a rabbit fastened with nails. So this is that book – but I've fleshed it out some, adding sections on carving, and detailing the construction of some iconic 17th-century joiners' work.

Since the late 1980s, I've explored the answers to the question, "How did early New England joiners make their oak furniture?" The oak work is characterized by frame-and-panel and mortise-and-tenon construction, and, in New England, the use of riven stock. The period I focus on is from the earliest settlement (circa 1620-1630) to the late 17th century, when the oak furniture made by joiners gave way to cabinetmakers' work in sawn boards using maple, pine and, slightly later, mahogany.

This led me down a long and rambling path, studying in great detail period furniture and tool history, as well as social history and material culture. These last two are closely tied to the museum work I did between 1994-2014. To best understand the ins and outs of oak furniture, I spent as much time as I could studying the surviving works in museums and private collections. Often the tool marks remaining on an object can serve as a roadmap for us to reproduce the techniques long lost to modern woodworkers.

To learn about the tools used in this work requires a multi-faceted approach. In addition to the tool marks, there are documentary records citing what tools were then in use. The best-known of these are Joseph Moxon's "Mechanick Exercises: or the Doctrine of Handy Works" (London, 1678) and Randle Holme's "The Academy of Armory and Blazon" (Cheshire, 1688). Further views into the lives of early joiners come from studying court records, particularly probate records such as wills and inventories. Reading probate inventories is a nosy person's delight; a detailed one is a blow-by-blow walk through of the house, naming (and recording the value of) all the things the appraisers see. Some researchers get wrapped up in the textiles, others

in real estate or farm equipment. I look for furniture, tools and woodenware.

1633 Will Wright

inv: one chest... one smale Table wth a carpet, one Cupboard & a chaire wth a sifting trough £1-10, One old halfe headed bedsteed... 1 truncke & a little chaire table... One broad axe & 2 felling axes & 2 hand sawes. 1 thwart saw wth a wrest to it. 3 augers 2 chisels 1 gouge. 1 drawing knife, 1 prser 1 gimlet, 2 hamers, 1 pr of old hinges, 2 chest locks, 1 splitting knife. 1 tiller of a whipsaw. 3 yron wedges...

In 1633, John Thorp, carpenter of Plymouth, died and his estate was inventoried. The appraisers recorded a number of tools:

1 Great gouge, 6d; one gr brush & 1 little brush at 10d; 1 square 2s; one hatchet 2s; One Square 2s6d; 1 short 2 handsaw 2s; A broad axe 2s; An holdfast 1s6d; A handsaw 2s; 3 broad chisels 1s 6d; 2 gowges & 2 narrow chisels 1s; 3 Augers Inch & 1/2 1s; 1 great auger 1s4d; inboring plaines 4s; 1 Joynter plaine 1s6d; 1 foreplaine; A smoothing plaine; 1 halferound plaine 1s; An Addes 2s6d; a felling Axe 3s

Probate inventories usually answer some questions but raise others. That

research is an important component of my work, but this book is about how I make the pieces. The projects – a small bookstand, two carved boxes, a joined chest, a slant-lid box and a chest with drawers – are based on my best understanding of historical pieces I have studied. This sort of reverse engineering has been a great source of challenge, excitement and discovery for me. But you don't have to follow that lead. You can take these ideas and develop your own designs, constructions and furniture forms. The concepts of frame-and-panel construction using mortise-and-tenon joinery are timeless, and can be arranged in many ways.

Whether you choose to reproduce

the historical examples or adapt them to new designs, you will be in good company. Look at these examples, then look at the works of William Morris and other Arts & Crafts-era furniture forms. The frame and panel has never fallen out of use – for good reason.

You will learn a lot about wood if you choose to take the route from log to stock, but if you have no access to green wood, don't let that stop you. Use what you have until you can convince your family to move to where there are good hardwoods. Lots of joined furniture was made in England (and elsewhere) with stock that makes me cringe, but it worked and has survived for centuries. I avoid kiln-dried woods, but use air-

dried stock from time to time. Others work just fine with kiln-dried stuff.

My favorite furniture wood remains straight-grained riven oak. One of my early woodworking influences, Daniel O'Hagan, used to quip "white oak is king." The queen, in his mind, was white pine.

Once I visited him and he told me that everything one needs can be made from either white oak or white pine. I looked down, and he was working black walnut. "Anything you need I said," said he. "What you want might be different." Indeed.

Peter Follansbee
September 2018





Bookstand

After building all these boxes and chests, something happens. You have scraps, off-cuts, short bits of this and that left over. These bits of wood accumulate around the shop of most woodworkers I know. Reminiscent of Donald Hall's "String Too Short to Be Saved"—they are a lignin guilt trip, collecting dust and taking up space. When using riven stock, you have a lot of time and labor invested in these bits, and they are perfect quartered stock. Surely they're too good to burn, but how to use them? They are usually too short to be truly useful, or too few in number to amount to much. Mostly, they sit there mocking you as they take up every available space, waiting for a day that may never come.

I stumbled onto one small item that uses scraps and adds some specialized mortise-and-tenon joints to the repertoire to boot. For years I made turned bookstands based on a single example I studied in a house museum in Massachusetts. One thing that always bothered me about that one was its singularity. I'm leery of "unique" items; they are hard to pinpoint as to when they might have been made. So I was thrilled one day to find another bookstand in an auction catalog. Even better, this one was joined. So I've

since made several, some in oak, some in walnut. I based the proportions on the turned one I studied.

The joinery was another matter. With only one photo to go by, I had to impro-

vise. So what follows is pure speculation, but it makes a fine bookstand.

Start by choosing and prepping the stock (you can substitute sawn stock if you have no riven wood). The stand



Fig. 9.1 A bookstand was not a common item in 17th-century homes. It provides some challenges, but is a small enough project to go fairly quickly.

is composed of two stiles, one top rail and the bottom shelf. In between these two parts are two crosspieces, into which are fitted the two pieces that form the ratchet mechanism.

Make the stiles from stock that's about 1" or more in thickness. Mine

are around 2" to 2-1/2" wide by 16" long. After dressing the stock, carve the design. I've used various patterns – just keep in mind the parts are pretty narrow. Next comes the joinery. I made a story stick to lay out the stiles because I knew I'd make these again and

again. You can follow my dimensions, or adapt some of your own. Chop a 5/16" mortise for the crest rail, about 1-1/2" deep. Lay this out so the tenon is stepped down from the top edge of the top rail. This top rail is about 2-3/4" high (and 12" shoulder to shoulder), so I made the mortise about 2" long. This keeps the joint from showing at the top of the rail-and-stile juncture.

The mortise for the shelf is trickier. I wanted the shelf thin to keep the bookstand from becoming too heavy and awkward. Chopping this 7/16"-long by 5/16"-thick mortise seemed fraught with peril; there's no room to pry. So I chose to bore the bulk of it out and clean it up with a paring chisel.

The mortises for the crosspieces are also bored, not chopped.

Mark a centerline and prick the spacing. For accuracy, I use an auger bit when boring these, in this case a 1/2" bit. Then saw and chisel a flat round finial at the top of the stiles.

The crest rail's details can vary. I made one version of this stand with a row of arcs cut in its top edge. Mark these out with gouges or a compass. To cut them, saw down to the spot where two curves meet, then chop down the arcs with a chisel. Another top rail has small ogees cut along its straight edges. I make these rails with barefaced tenons, that is, a tenon with no rear shoulder. They don't have to be this way; I think I used this joint on my first joined bookstand, probably stemming from the thin stock on hand. Ever since then, I've made these rails featuring barefaced tenons.

Plane the stock to 5/8" thick; the back of the 5/16" tenon is flush with the back face of the rail. These joints are drawbored and fastened with tapered oak pins.

The shelf is another story. I couldn't see the joinery used on the shelf in the only photograph I had, so I decided to make it up. This one's about 7/16"



Fig. 9.2 Careful paring with bench chisels will get this mortise trimmed to the proper size, without crushing the surrounding wood.



Fig. 9.3 I used a small square to line up the auger bit, then set it out of the way for boring.



Fig. 9.4 A simple way out: Saw facets around a scribed circle, then pare it round with a chisel.



Fig. 9.5 A barefaced tenon, shown from the back. This is a common joint in joined chairs. I used it here to help lighten the bookstand. Or to add variety to my narrow joinery repertoire.



Figs. 9.6 Here is the shelf with its lipped tenon all cut, and the outer corner of the shelf trimmed.



Fig. 9.7 The shelf entered into the stile. See how the "lipped" section fits in front of the stile.



Fig. 9.8 Three rip cuts define the lipped tenon. I made a cut across to bring the tenon to its finished length.

thick. But how to join it to the stiles, and have it overlap the front face of the bookstand's frame? I decided to adapt a tenon I have seen on joined work from the 17th-century Plymouth Colony and elsewhere. For lack of a better term, furniture historians have called this a "lipped" tenon.

I decided I wanted the shelf to extend about 3" in front of the frame,



Fig. 9.9 I've cut the rear shoulder out of the way. Now chop out the waste between the tenon and the shelf.



Fig. 9.10 Alternate between the vertical chopping and breaking out the waste.



Fig. 9.11 The finished joint before trimming the ends of the shelf.



Fig. 9.12 Test fit in the stile.

and marked a line this distance from the shelf's front edge. Then I marked out the tenon placement and thickness from this line. The shoulder-to-shoulder dimension matches that on the top rail. The ends of the shelf run beyond the sides of the stiles by about 3/4".

Saw down the struck lines with a rip saw, then chisel out the bits between the tenon and the overhang. Saw off the rear shoulder. Clean up the end grain with a sharp chisel. Cut the tenon to length (less than the depth of the mortise).

The two crosspieces that engage the ratchet parts are 1"-square sections. Chop 5/16" by 1-1/2" mortises in these pieces before turning them. I've taken to making these through-mortises, so I mark out the joinery on both sides. This allows me to chop these mortises from both sides, resulting in a tidy finished joint. Now mount the piece on the lathe and turn the tenons. The good news is these are the easiest tenons of your career – they have to be undersized! That's how the ratchet parts swing to adjust the angle of the bookstand.

The ratchet mechanism parts are also oak, about 1-1/2" wide by 3/4" thick. The upper one is about 9-3/4" long, the lower about 10-1/4" long. Cut the tenons, then the notches in the lower one. Finally, taper the upper one to engage the notches. The tenons are the full width of the stock. Cut them just as for any 17th-century joinery work, with undercut front shoulders and rear shoulders cut behind the line. These get drawbored, too. But first cut the notches and tapers in them. Lay out the notches half the thickness of the stock, and about 1" apart. Saw down to a marking gauge line with a tenon saw.

Now comes the part that requires some thought – you can easily chop the notches in the wrong direction. I always stop and try to visualize how the piece fits into the bookstand then check to see that I remove the stock



Fig. 9.13 A very simple assembly, just the top rail and the shelf are critical. The middle rails need to be loose.

from the correct side of the saw kerf. To chop these, first use the chisel bevel down to waste out the wood, then flip it over to pare the final surface of the notch more cleanly. Shave a slight bevel on the edge of the notches, too.

Tapering the upper ratchet part is easy enough, and there are many ways to do it. You can use a hatchet, plane, spokeshave – really, just about any cutting tool. Test-fit the end into the notches to see that it fits all the way down to the notch bottoms.

Once you have these two pieces cut, you can pin them into the crosspieces. Drive your tapered hardwood pins into the offset holes to secure the parts together. Trim the pins front and back.

Now set one stile on edge on the

bench with its mortises facing up. Drop the top rail into its mortise, then the two middle rails and the bottom shelf with its lipped tenon. Because the shelf runs long beyond the stiles, you might need to prop the stile up on some scraps to be able to drive the shelf all the way home in its mortise. Drive the other stile onto the ends of all these pieces that are sticking up in the air.

I glue the shelf's joints and pin the top rail. The middle rails should swing freely. I often will wax their joints before assembly. Trim any protruding pins, then apply a finish. I make pegs for holes I've bored in the shelf for holding the book open. They're small diameter holes and the pegs (or pins) are just like those used for securing joinery.

