HAND CUT DOVETAIL JOINTS

Let me start with a disclaimer.  I’m very aware that for those of you who are professional woodworkers who engage in production or semi-production work, using commercially available dovetailing machines and elaborate jigs is not only a sensible way of working but an economically necessary one.  I was a professional furniture maker for over 40 years, after all, and I get it.  That said, though, I’ll still argue that time spent becoming skillful in producing hand cut joinery will always pay dividends by making you smarter and much more productive users of those wonderful machines and jigs.

But for those of you for whom woodworking is an activity that you engage in simply for the pure joy of making cool stuff, it’s quite possible that the layout and production of complex joinery, and particularly dovetail joinery, may remain somewhat mysterious.  So, my goal for this hour is simply to provide some useful information for the less experienced among you and maybe even a few tidbits for those of you who are further along in your craft journey.

So—The dovetail joint in its many variations.  It is an ancient woodworking joint, probably only slightly less venerable than the lap joint or the mortise and tenon, and has been admired and used extensively by craftsmen in virtually every woodworking culture on earth.  And the reason is readily apparent.  It’s a joint that when well executed results in a strong, versatile, and elegant connection between two pieces of wood, usually at the end grain but not always.  The most common variations consist of two parts—the pins, cut on one of the members and the tails, cut on the other, and they resist two of the three forces that wood joints are susceptible to very well.  They resist the third force only moderately.  These forces, in case you’ve forgotten, are tension (the tendency of a joint to pull apart in the same way it went together), shear (the tendency of a joint to slip vertically or horizontally under load), and moment (the tendency of a joint to rotate or twist under load).  A dovetail joint handles shear and moment brilliantly.  Tension, not so much.  You must rely on an adhesive or on some sort of mechanical pin to resist the tendency of the joint to come apart under load in the same way it went together–or, if you’re Japanese, you invent twisted dovetails which resist all three forces very well.

In Japan, every wood joint falls into one of two categories—Tsugite or Shiguchi.  Tsugite joints are those that splice together pieces of wood from end to end and Shiguchi joints are those that connect wood at right or other angles. The grain of the mating pieces are parallel in the former and perpendicular in the latter.  Dovetail joints, it should be no surprise, are well represented in each of these categories.  But for our purpose here I thought it best to focus on the most common Shiguchi dovetails, those that connect two

wood members at right angles at the end grain.  They are the Through Dovetail, the Half-blind Dovetail, and the Full-Blind Dovetail.  But I’m not going to show you how I layout and cut these joints.  There are hundreds of tutorials, both online and in books, that will take you step-by-step through the layout and fabrication process of each of these and explain them far better than I.  I’m going to focus, instead, on simply sharing a small selection of tips, tricks of the trade, and double-secret-handshake stuff that I’ve learned over the years that I hope will be helpful.

Let’s begin at the beginning.  As you all know, any successful efforts in joinery fabrication depend not only on the extent of your skills as craftspersons, but also on the use of good quality, well maintained tools and properly prepared material.  I’ve brought a selection of some of the tools I typically use and please do feel free to check them out.  I use these particular tools because they’re the ones I’m used to and because they work well for me.  You may have others that you prefer and that’s perfectly fine, as long as they are of good quality and are set up properly. But in addition to good tools and properly prepared material, there are some other things that I’d suggest you consider.

-When you set out to engage in fabricating complex joinery your body should be relaxed and you should be in a good frame of mind.  So take a few minutes to loosen up, do some stretches, breathe or whatever method you need to use to relax some of the tension in your arms and shoulders and neck before you begin.  You’d never think to pull into a parking lot, jump out of your car, and immediately compete in a marathon.  So why would you do the equivalent of that by jumping straight into the challenging mental and physical task of laying out and cutting complex joinery without some kind of warm-up.  Try it next time and I think you’ll be surprised at how much it will improve your skills.

-De-clutter your bench.  Lay your material, tools, jigs, and fixtures out sensibly and close at hand.  You’ll already, of course, have ensured that your marking and measuring tools are precise, that your chisels, plane blades, and saws are deadly sharp (more about that in a moment), and that your material is exactly straight, flat, and square.

Sharpening is a subject woodworkers hear a lot about, talk about even more, and then promptly find all kinds of wonderful reasons to neglect.  But we’d all be wise to recall that there was a good reason why every young apprentice was taught from the outset that their working day always began by sharpening all the tools that would be used that day.  It was a fundamental practice that all apprentices, including me, were taught from day one and was one that remained forever embedded in their work lives just as it has in mine.  The reason was/is simple.  If your chisels, plane, blades, marking knives, and saws are not sharp—that is, the back of the blade or sawtooth, the bevel, and the mating edges are not perfectly flat and the junction where the two planes meet is not as fine as it can be made—it will be nearly impossible to do work of real quality and consequence.  So take the time to do it right.  It will make an important difference.

Common Through Dovetail Joint-  Because both parts (pins and tails) are visible, this is usually the joint of choice when utility is more important than aesthetics or when the joinery itself is a featured part of the design.  Layout is done in the usual manner with either the pins or the tails scribed and cut and the other part indexed from those cut surfaces.

The debate over which should be cut first, the pins or the tails, has been going on since the beginning of time and the simple truth is that it doesn’t much matter.  Try both and choose the one you like.  I was taught to do pins first and I think there are definite advantages to laying out the joint this way but an argument can also be made that doing tails first makes subsequent layout easier, especially if you’re not using an indexing board.  Who knows?  One thing remains constant, though, and forgetting it is a rookie mistake you must avoid.  Pin layout is always done on the end grain and tail layout is always done on face grain—except when it’s not.  There are certain species of specialty dovetails that don’t follow the rules.  But that’s a conversation for another time.

Half-Blind Dovetail Joint–  This is the joint of choice for most drawer construction because, generally speaking, the design of the case requires an uninterrupted visual across the drawer face.  The layout of the joint is altered a bit in order to achieve the result and fabrication has to be adjusted slightly but otherwise the joint is cut and assembled in basically the same way as a through dovetail.

Full-Blind Dovetail Joint–  This version of the joint is the one to choose when the design of the case requires an uninterrupted flow of wood grain on all surfaces.  And the only way to make that happen is to completely hide the mechanical parts of the joint within a miter joint.  Yep, the Full-Blind is both a miter joint and a dovetail joint and it is important to understand that it’s the miter part of the equation that determines success or failure.  When the joint is done well, it results in a clean, unobtrusive corner that is elegant in its deceptive simplicity.  In Japan, sashimono-shi (cabinetmakers) almost always use this joint in high quality casegoods construction because it is considered to be a nearly perfect representation of the Culture of Iki.  Iki translates roughly as Chic or Stylish and refers to the aesthetic ideal of a subdued display of taste that belies, at first glance, the effort taken to achieve it.  It must be said, though, that this joint was also popular with Shaker carpenters, though for a different reason altogether.  For them, pride or boastfulness was to be avoided, as was any kind of show-off joinery.  So, for the Shakers, the hidden nature of the joint was an intentional evocation of humility.

The fabrication of all these joints is fairly straightforward—lay out and mark the joint on the surfaces of the parts, use a handsaw to cut it close, use a chisel to cut it closer, dry fit, adjust, and finally apply adhesive and seat the joint.  But, of course, the process is never as simple as it sounds.  And that’s where jigs and fixtures enter the picture, along with a couple of layout tricks of the trade.