

## simple & strong Draw-Bolt Joinery

This rugged system is easy to make, knocks down in a jiffy, and is perfect for big projects.



Big projects, like workbenches, tables, and beds, call for heavy-duty joinery. Because of the use (and unfortunately, abuse) these projects endure, you want joints that can stand up to it.

One simple method I often turn to is draw-bolt joinery. It uses a system of hardware to create a stout joint. And it allows you to easily take it apart for moving or even snug up the connection if it loosens over time.

You can see how it works in the photo above. A long bolt runs through the leg and into a nut in a pocket in the end of the stretcher. Washers on both ends prevent the wood from deforming.

**Alignment.** The bolts provide plenty of muscle. But a single connection point means the stretcher could twist out of alignment.

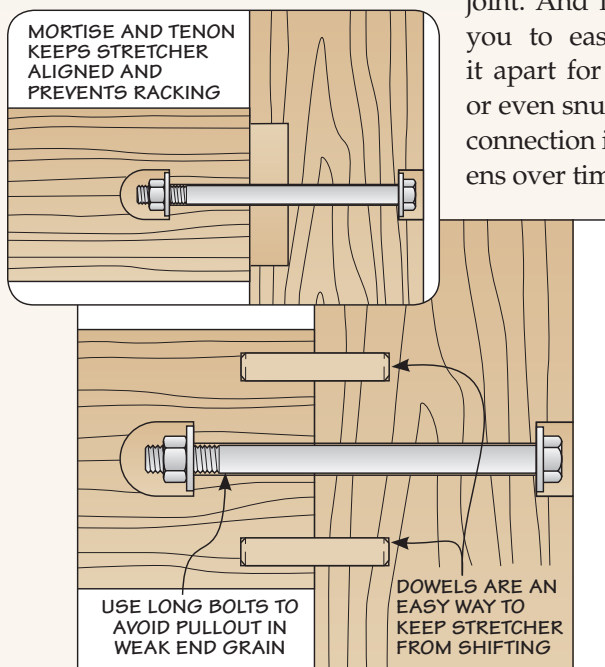
One way to keep the parts aligned is to use dowels, as shown in the drawing at left. A second option, a mortise and tenon joint, is shown in the detail at left.

**Creating a Joint.** With a grasp of the “mechanics,” let’s step through the process. And you’ll find a few tips to help get the best results.

One more thing: It’s possible to complete everything with a hand drill. But using a drill press for a few steps will add some accuracy.

### BEGIN WITH THE LEG

I like to start by drilling a couple holes in the legs at the drill press. First, use a Forstner bit to create a counterbore to recess the head of the bolt and a washer.



▲ **A Counterbored Hole.** The drill press makes drilling the counterbored bolt hole in the leg fast and accurate.



▲ **Two Dowel Holes.** A drill bit makes it easy to locate the shop-made drilling guide.



▲ **Drilling the Stretcher.** A fence on the drilling guide positions the holes properly and allows you to clamp it in place on the stretcher.



▲ **The Cross Hole.** Drill the cross hole on the inside face of the stretcher with a Forstner bit.



▲ **Square it Up.** With a chisel, create a flat bearing surface for the washer and nut.

For the through hole, simply replace the Forstner bit with a brad point bit. This allows you to drill the through hole without changing the setup (first photo at the bottom of the opposite page).

**Drilling the Dowel Holes.** There are just two more holes to drill on the leg before you can move on. And those are the holes to accept the alignment dowels.

These two holes will need to match the holes that you'll drill in the stretchers later on. To get it right the first time, I made a simple drilling guide. It's sized to match the end of the stretcher so you can locate the holes in each piece consistently. The drilling guide is positioned on the inside face of the leg (lower right photo on the opposite page) and clamped in place. Then you can drill the dowel holes.

## THE STRETCHERS

Now you can get to work on the stretchers. You'll use the drilling guide to drill holes in the ends of the stretchers (left photo above).

Drilling the two dowel holes isn't a big deal. But depending on the length of your bit, you may need to remove the guide to complete the bolt hole to its final depth.

**Cross Hole.** The last task is to drill a hole that allows the nut and washer to thread onto the bolt inside the stretcher. This is a two-step process. Note: It's best to drill this hole on a hidden side of the stretcher — especially furniture projects like beds and tables.

To locate this hole, you'll need to first determine just how far the bolt extends into the stretcher. Then you can use a square to align the cross hole with the bolt hole.

Here again, the first step takes place at the drill press (center photo). You want to make sure to drill this hole deep enough so the nut will engage the bolt.

Back at the workbench, your next task is to flatten the "leg" end of the cross hole. This provides a wide bearing surface for the washer and nut. To do this, I draw a couple of layout lines and use a chisel and a mallet to trim everything up.

**Assembly.** Completing the cross hole means you're ready for assembly. After inserting a couple of dowels (you don't need to glue them), it's just a matter of threading the bolt into the nut.

With a few turns of a socket wrench, the joint is rock-solid and secure. And when it comes to heavy-duty joinery, there's nothing more you could ask for. 🛠️

## Specialty Hardware: Bed Bolts & Bench Bolts

Using ordinary hex bolts and nuts to secure a draw-bolt joint is a common and inexpensive way to go. But there are two other hardware alternatives to consider. (To find out where to find these, turn to Sources on page 51.)

**Bed Bolts.** One option you may want to consider is old-fashioned bed bolts. The black bolts and nuts have square heads that give them a traditional look. The head of the bolt is flared to provide a wider

bearing surface, eliminating the need for another washer.

To tighten them, you can use either an ordinary wrench or a bed bolt "key" (photo at right).

**Bench Bolts.** Instead of a hex nut, Veritas' bench bolts use a round barrel nut. This simplifies the process because you only need to drill a 1"-dia. hole for the nut to fit into. And you don't need to worry about holding onto the nut while tightening the bolt.

