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Classic Project

In this plan you'll find:

- Step-by-step construction instruction.
- Construction drawings and related photos.
- Tips to help you complete the project and become a better woodworker.

Shopmade Handscrews

the handle end of the dowel, trim the opposite end to establish the 16¾ in. dowel length, then file away the threads at that end to leave a clear section ¾ in. diameter by ⅞ in. long.

For the front dowel, run the threads to a point 4½ in. from the handle end of the dowel, then trim the opposite end to establish the 16¾ in. dowel length. Test your dowels in the clamp jaws to make certain they turn smoothly and the threads don't bind.

Making The Handles

The handles on the two clamps shown are cherry. Cut a length of stock 1½ in. square by about 10 in. long. If you don't have 1½ in. thick stock, just laminate two pieces of ¾ in. stock to achieve the required thickness. Then tilt the table saw blade over to 45 degrees, and rip off the four corners of your 1½ in. square handle stock. Your stock should now be an octagon (be sure to check your rip fence setting by running a piece of 1½ in. square scrap through the saw first, before you actually make the cuts on your handle stock).

Now crosscut the handle stock to make a pair of 4½ in. long handles. Move to the drill press, clamp the handles securely (one at a time) and drill a 1 in. diameter by 2½ in. deep hole in the end of each handle. Chamfer the handle ends, but don't apply the chamfer to the inside end of the front handle. Then use a generous amount of epoxy to glue the handles onto the unthreaded ends of the dowel rods. The handle with the chamfer free end is glued to the frontmost dowel; the chamfer is left off since this end of the handle is the bearing surface when the handles are tightened.

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Shopmade Handscrews

Old-style clamps are a pleasure to use

We'll often marvel at the exquisite workmanship on antique furniture, but do we appreciate just what went into the creation of such work, without benefit of any power tools? It's hard to imagine how complex moldings, delicate joinery, and perfectly flat surfaces could be achieved without a power planer, jointer, router and table saw. Yet craftsmen of old had hand saws, smoothing and jointing planes, molding planes, and a host of other hand tools that did all this and more.

Actually, most of our hand tools really haven't changed all that much, and clamps are a good example of this. The standard steel spindle handscrew clamps that can be found in most shops today are just a further refinement of the basic wooden handscrew. Pivoting steel nuts and threaded steel rods have replaced the old wooden threaded rods that fit through matching holes tapped through the clamp jaw. But except for the fact that the old handscrews don't have the angle clamping capacity of the modern version, in parallel clamping function, both clamps work quite well.

The clamps shown are a copy of a 19th century clamp made by the Bliss Manufacturing Company in Pawtucket, Rhode Island. However, where the Bliss clamp was made of a local hardwood, and featured one-piece lathe-turned dowels with integral handles, we've used a combination of cherry and curly maple, and utilized dowel stock with octagonal shaped handles that are glued onto the threaded dowel rods. The 3/16 in. bead on the top edge of the clamp jaws is strictly a decorative element.

You could turn the handles and dowels from a single piece of wood, if you happen to own a lathe, but by using the dowel stock with an applied handle construction system, much of the fussiness of making handscrews is eliminated. The dowel stock that we used is cherry and birch, purchased from Constantine's (www.constantines.com), but you may want to buy dowel stock from the same source as your tap and die set.

Tips

When starting your threads, the tap has a tendency to lift the grain at the surface, often producing a little tear-out. You can add a chamfer around the entrance perimeter to clear away some of this roughness, or just sand the top surface down a bit.

Like any machine screw thread, the tap will cut the same thread no matter which end of the hole it's started from, so don't worry about a right or wrong way to run the tap.

When using the threadbox to cut threads, starting the threads is often the most difficult part. If you seem to be having trouble starting the threads by turning the threadbox with the dowel clamped securely, try holding both the dowel and the threadbox in your hands, and turn the dowel into the threadbox. Don't continue to apply downward pressure once the threads are started. The threadbox will automatically advance the dowel.

Once your threads are started, you may find it easiest to clamp the dowel with a simple shopmade jig. It's just a length of scrap stock drilled through lengthwise to the dowel diameter, with a kerf cut along the center of one side. Slide the dowel into the jig, then clamp securely in the bench vise as shown in the photo. The jig easily holds the dowel securely and also prevents the vise from deforming the dowel out of round.

Making The Jaws

Start by making the clamp jaws. We show two versions, one a sandwich of curly maple around cherry; the second a sandwich of cherry around curly maple. You could use a single 2 1/4 in. thick board for the jaws, but 3/4 in. stock is more easily obtained. A sandwich of three layers yields the required 2 1/4 in. thickness. Once your lamination is out of clamps, cut the jaws to their 2 1/4 in. width and 16 in. length, and establish the 30 degree taper on the business end of the clamp jaws, as indicated. Then use the router and a 3/16 in. beading bit to apply the decorative bead on the outside face of the jaws, and a chamfering cutter to apply the 1/8 in. chamfer around the inside face.

Now lay out the various hole locations. Note that alignment of the holes in the jaws is essential for the clamps to work properly. The holes in the top jaw section are both tapped. Drill through with a 7/8 in. diameter brad point or Forstner bit, then use the tap to cut threads through the full length of each hole. Lubricate the wood liberally and back the tap off periodically to clear the chips.

The holes in the bottom jaw are not threaded. The frontmost 1 in. diameter hole goes entirely through, but the 3/4 in. diameter back hole is drilled from the inside face and only extends 7/8 in. deep, forming a neat little pocket for the clear (no threads) section on the bottom end of the back dowel.

Threading The Dowels

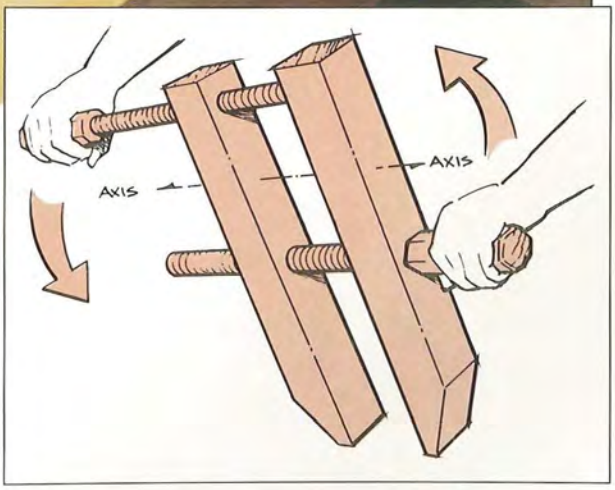
Carefully select your best lengths of dowel rod, then cut two lengths of about 18 in. each. A single 36 in. dowel is enough for one clamp. The 18 in. length allows a little over an inch for starting the threads, an area that often suffers from some chipout. Once the threads are complete, trim the excess off. On the back dowel, stop threading 2 1/2 in. from

the handle end of the dowel, trim the opposite end to establish the 16 3/4 in. dowel length, then file away the threads at that end to leave a clear section 3/4 in. diameter by 7/8 in. long.

For the front dowel, run the threads to a point 4 1/2 in. from the handle end of the dowel, then trim the opposite end to establish the 16 3/4 in. dowel length. Test your dowels in the clamp jaws to make certain they turn smoothly and the threads don't bind.

Making The Handles

The handles on the two clamps shown are cherry. Cut a length of stock 1 1/2 in. square by about 10 in. long. If you don't have 1 1/2 in. thick stock, just laminate two pieces of 3/4 in. stock to achieve the required thickness. Then tilt the table saw blade over to 45 degrees, and rip off the four corners of your 1 1/2 in. square handle stock. Your stock should now be an octagon (be sure to check your rip fence setting by running a piece of 1 1/2 in. square scrap through the saw first, before you actually make the cuts on your handle stock).



Now crosscut the handle stock to make a pair of 4 1/2 in. long handles. Move to the drill press, clamp the handles securely (one at a time) and drill a 1 in. diameter by 2 1/2 in. deep hole in the end of each handle. Chamfer the handle ends, but don't apply the chamfer to the inside end of the front handle. Then use a generous amount of epoxy to glue the handles onto the unthreaded ends of the dowel rods. The handle with the chamfer free end is glued to the frontmost dowel; the chamfer is left off since this end of the handle is the bearing surface when the handles are tightened.

For added strength, you can add a 1/8 in. diameter brass reinforcing pin (not shown) through the handle and dowel.

Using Your Handscrews

Once the epoxy has dried, you can assemble and use the clamps. We rubbed on an oil finish to bring up the beauty of our clamps. Some graphite on the threads was the traditional favorite for lubrication. Graphite tends to fill any open pores and reduce friction.

Quick adjusting the clamps is a fairly easy task—just grasp both handles as shown, then use a paddling motion to loosen or tighten.

Once your handscrew is securely in place on whatever is being clamped, maximum clamp pressure is applied by turning the back handle to slightly spread the back of the jaws. This creates a fulcrum action around the front dowel, producing considerable pressure at the front of the jaws.