



Turn Pulls Without a Lathe

Create custom knobs using your drill press

BY CHRISTIAN BECKSVOORT

When I started making furniture on my own, I had only a tablesaw, bandsaw, jointer, and drill press—no lathe. One of my earliest projects was a seven-drawer chest. What to do about knobs? I wanted authentic-looking Shaker mushroom knobs in graduated sizes to match the drawers. But commercial Shaker knobs were avail-

able only in small and large, and they were crude approximations of the real thing. By necessity, I soon discovered how to make good-looking knobs without a lathe. All it takes is a drill press, a tenon cutter, and a few rasps and files.

The process is simple and surprisingly quick.



Make the tenon



A simple jig with a toggle clamp and an L-shaped fence holds the blanks for tenoning.



Pinpoint positioning. To locate the tenoning jig, put a brad-point bit in the drill press and align its tip with the centerpoint of a pull blank.

Quick, clean tenons. Make the tenon at least 1½ in. long, so there's plenty of tenon for the chuck to grip and ¼ in. below the chuck for clearance while you're shaping.



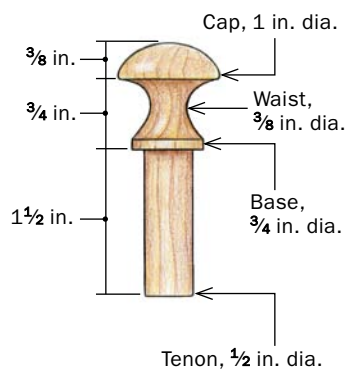
Saw off the square collar. Four quick cuts liberate the tenon. A notched scrap of plywood serves as a fence and a stop, making the bandsaw cuts easily repeatable.

Chop the corners. To speed the shaping work on the drill press, knock off the four corners with a chisel, creating a rough octagon.

Turning with a drill press

Set the drill press to its highest speed and use rasps and files to shape the pull.

SHAKER MUSHROOM KNOB

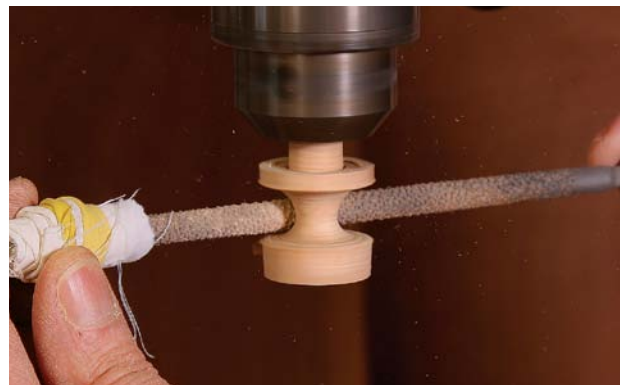


Start with a cylinder. Turn the rough octagon to a perfect round with a flat, coarse rasp (right). Check the diameter with a pair of calipers (inset).

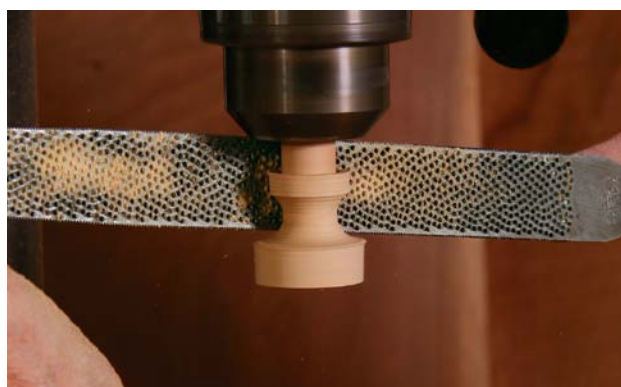


1. FORM THE WAIST AND THE BASE

Round rasps for a coved waist. Use a coarse, $\frac{3}{8}$ -in.-dia. round rasp to remove most of the material from the waist (right). Then use a fine, $\frac{1}{4}$ -in.-dia. round rasp to create a tighter radius between the waist and the cap (far right).



Shape the base. With a coarse, flat rasp (right), reduce the diameter of the base. Then use the $\frac{3}{8}$ -in.-dia. rasp to make the gentle transition between the waist and the base (far right).



Start by making square blanks 2½ in. long and ⅝ in. to ¾ in. thicker than the largest diameter of the knobs you're making. The only critical dimension is the tenon, which must be precisely ½ in. dia. to fit a ½-in. hole snugly. I don't recommend making knobs with tenons smaller than ½ in. on the drill press, because they could snap under the pressure of rasping and filing.

Tenon first

The fastest way to make a clean tenon is with a tenon cutter in the drill press (see "Sources," p. 60). If you're making a series of knobs, it's worth building a jig to hold the blanks in place for tenoning. The jig is simply a flat plywood base with two upright fences creating a 90° corner. To position the jig precisely beneath the quill, draw diagonals on the end of a blank, put a brad-point bit into the chuck, and center the tip of the bit on the blank. Then clamp the jig to the drill-press table and replace the brad-point bit with a tenon cutter. Set the depth of cut to about 1½ in. and drill. You'll

want an inch or so of tenon for the chuck to grip, and at least ¼ in. exposed below the chuck—clearance for your tools while you're shaping the knob.

To remove the collar of waste around the tenon, make four shallow cuts on the bandsaw. If you have a batch of blanks to do, make a quick jig by notching a piece of plywood and clamping it to the bandsaw table so it cuts at the right length and to the right depth. Once that's done, you're ready to begin "turning" the business end of the knobs. To make the process a bit easier, first chop off the four corners with a chisel, creating a rough octagon.

"Turn" the cylinder

Now the fun starts. Insert the tenon into the drill-press chuck, leaving about ¼ in. of the tenon exposed, and tighten. Set the drill press at its fastest speed (largest pulley on the motor shaft, smallest pulley on the drill shaft), and use a coarse, flat rasp to smooth the octagon into a cylinder. Too much pressure can break the tenon, so start with a light touch until you get the hang of it. Stop frequently to clear chips from between the teeth of the rasp. Leave the cylinder slightly larger than

2. CREATE THE MUSHROOM CAP



Rasp it round.
Rough out the shape of the cap with a coarse flat rasp, beginning with a chamfering cut at the perimeter.




File to the finish.
Follow the rasp work with a flat file to perfect the rounded shape of the cap.

3. SQUARE THE SHOULDER



Critical work in tight quarters.
Use a small file, either flat or triangular, to clean up the shoulder of the base. The shoulder must be smooth and flat to seat tightly against the drawer front or door.

 **Online Extra**

To watch a video demonstration of Becksvoort's drill-press technique, go to FineWoodworking.com/extras.

Final smoothing

Sand by hand. Beginning with 120-grit paper and running up through the grits to 320, sand the cap, waist, and base.



This belt fits the waist. Bend a sheet of edge-sander paper to a curve that mates with the waist. Or roll sandpaper around a dowel.



Steel for smoothing. With the drill press still running, buff all the surfaces except the tenon with 0000 steel wool.

your desired final diameter to allow for shaping and sanding. To check the diameter, use a pair of calipers (or a shopmade gauge, or even a crescent wrench). With the cylinder finished and the drill press still running, use a pencil to mark the transition points in the knob's profile.

Shape the mushroom

Next, using a coarse $\frac{3}{8}$ -in.-dia. round rasp, form the waist of the knob. Once you've reached the desired depth, switch to a $\frac{1}{4}$ -in.-dia. round rasp to shape the tighter radius where the waist meets the cap. Then use the flat rasp to reduce the diameter of the base. Next, with the $\frac{3}{8}$ -in.-dia. rasp, smooth the curve between the waist and the now-smaller base. Last, use a flat rasp to shape the cap.

At this point the knob is in its final form and needs only minor smoothing. Do this with a set of flat and round files (or 80-grit sandpaper if you don't have files). Go over the base, waist, and cap with files, then switch to 120-grit sandpaper. To sand the waist of the knob, I fold paper from my edge sander to present an appropriately curved face. Alternately, you can roll sandpaper around a dowel and use that. Continue sanding to at least 220- or 320-grit, doing all the work with the drill press running.

The surface of the shoulder between the base and the tenon is likely to be rough, so smooth it with a small flat or triangular file. The shoulder must be perfectly flat and have a crisp edge in order for the knob to sit tight against the drawer front or door stile. If it is difficult to achieve that with the file, you can always undercut the shoulder surface with a chisel after you've removed the knob from the chuck. Before you turn off the drill press, there's one last step: Polish your custom pull with 0000 steel wool. □

SOURCES OF SUPPLY

FILES, FLAT RASPS, HANDLES
highlandwoodworking.com

ROUND RASPS
leevalley.com

TENON AND PLUG CUTTER
traditionalwoodworker.com



Contributing editor Christian Becksvoort is the author of The Shaker Legacy.

Clamp it home. Apply glue to the mortise in the drawer or door and use a hand-screw clamp to press the knob into place.

