Adjustable Lathe Jaws

These easily made jaws attach to standard four-jaw chucks

by Jim Leslie

A finely produced turning should display no telltale signs of how it was mounted on a lathe. Unlike marking-gauge lines on dovetailed furniture, grip marks on the base of a bowl are not meant to be seen. To get rid of them, you need to be able to mount your work so that it is held by its rim, and then turn the base. Large, adjustable jaws with rubber bumpers are commercially available, but they cost about $100. After looking them over, I decided I could build my own with scrap plywood and a few dollars worth of materials. It took me about three hours to construct my adjustable jaws, and after countless hours of use, I'm very satisfied with the results.

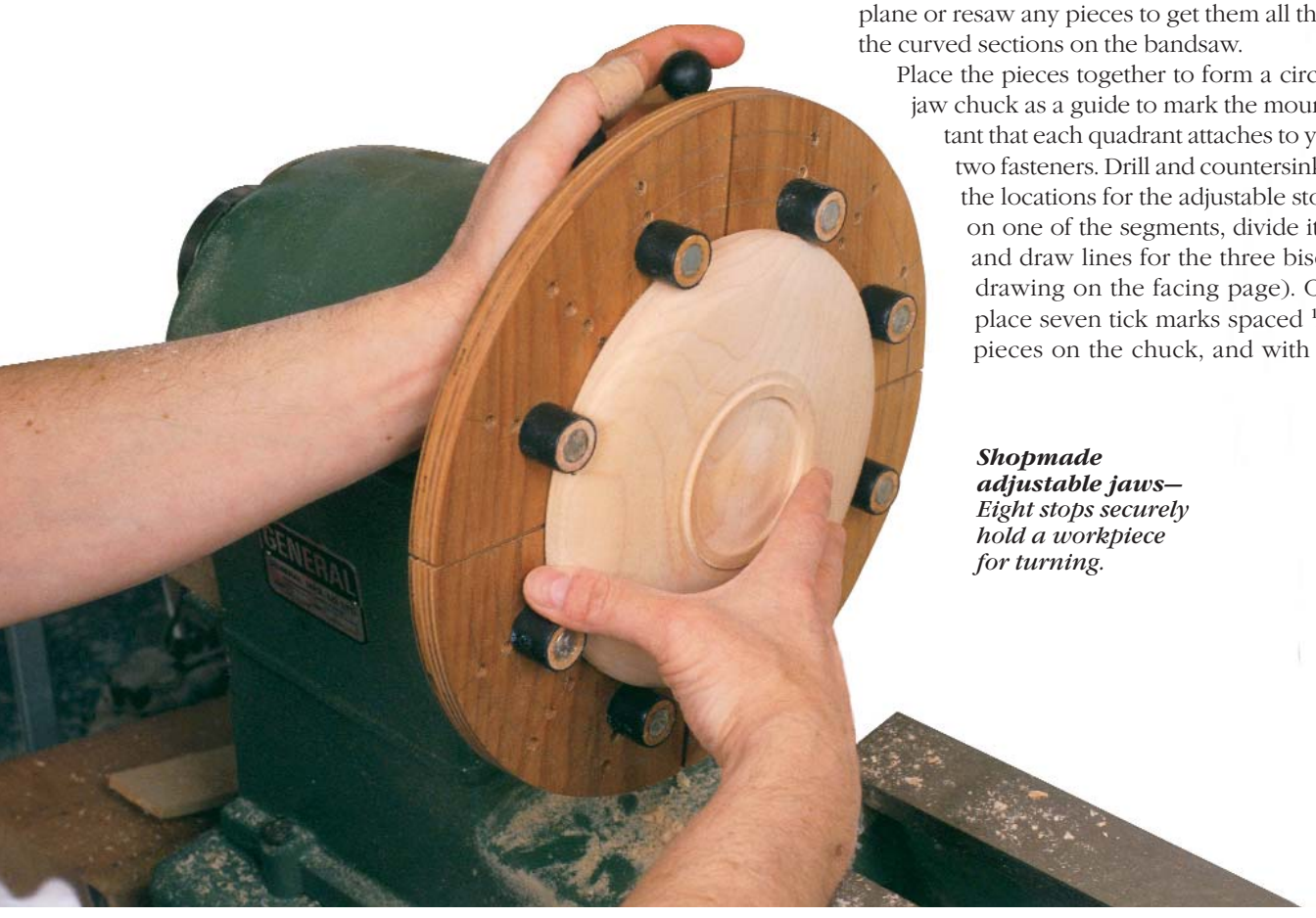
I built my jaws to fit an adjustable, four-jaw Nova chuck, but the fixture may be adapted to other four-jaw chucks by using the same procedures. These jaws allow me to mount bowls, rings and plates of different sizes. The jaws will also hold oddly shaped pieces.

Make the body of the jaws out of plywood

Every woodworker I know has a few scraps of plywood lying around. A 12-in. square is about all you need. It should be free of voids and at least ½ in. thick. The diameter of your jaws will depend on the swing of your lathe. Make them about 1½ in. to 2 in. less than the maximum swing so that when you fully open your chuck, the jaws don't strike the lathe bed.

Using a straightedge and a sharp knife, connect the corners of the plywood square, marking two diagonal lines to divide it into quarters. Where the lines intersect, place a compass point, and draw a 12-in.-dia. circle. Cut the piece into quarters. (If necessary, plane or resaw any pieces to get them all the same size.) Then cut the curved sections on the bandsaw.

Place the pieces together to form a circle, and use your four-jaw chuck as a guide to mark the mounting holes. It's important that each quadrant attaches to your chuck with at least two fasteners. Drill and countersink each hole. Next mark the locations for the adjustable stops. Using a protractor on one of the segments, divide it into four equal parts, and draw lines for the three bisecting angles (see the drawing on the facing page). On one of those lines, place seven tick marks spaced ½-in. apart. Mount the pieces on the chuck, and with the lathe turning at a



Shopmade adjustable jaws— *Eight stops securely hold a workpiece for turning.*

Photos: Alec Waters; drawing: Tim Langenderfer

slow speed, touch a skew to the ½-in. marks. Drill the holes for the stops where the skew marks intersect the radial lines. Before removing the segments for drilling, take a gouge or scraper to the outside edge of the plywood and turn it round.

After detaching the plywood segments from the chuck, stack and clamp them on the drill-press table, and bore the holes for the stops using a 13⁄64-in. drill. Finally, tap all the holes with a ¼-in.-20 tap using a reversible drill. If you plan to turn irregularly shaped pieces, you can machine a long, ¼-in.-wide slot at the 45° marks, which will give you infinitely variable attachment points for four bumpers. (Use longer bolts for those bumpers, and secure them with nuts.)

Use straight dowels for the bumpers

Dowel stock is sometimes more oval than round. Select round stock so that your bumper stops will exert even pressure on workpieces. I used ¾-in. maple dowels, which I cut into ¾-in.-long segments. Each of the eight dowel pieces was countersunk ⅛ in. deep exactly in the center with a ½-in.-dia. brad-point drill. This is best done on the lathe so everything is centered. After countersinking each piece, I switched to a ¼-in. drill and bored all the way through each one.

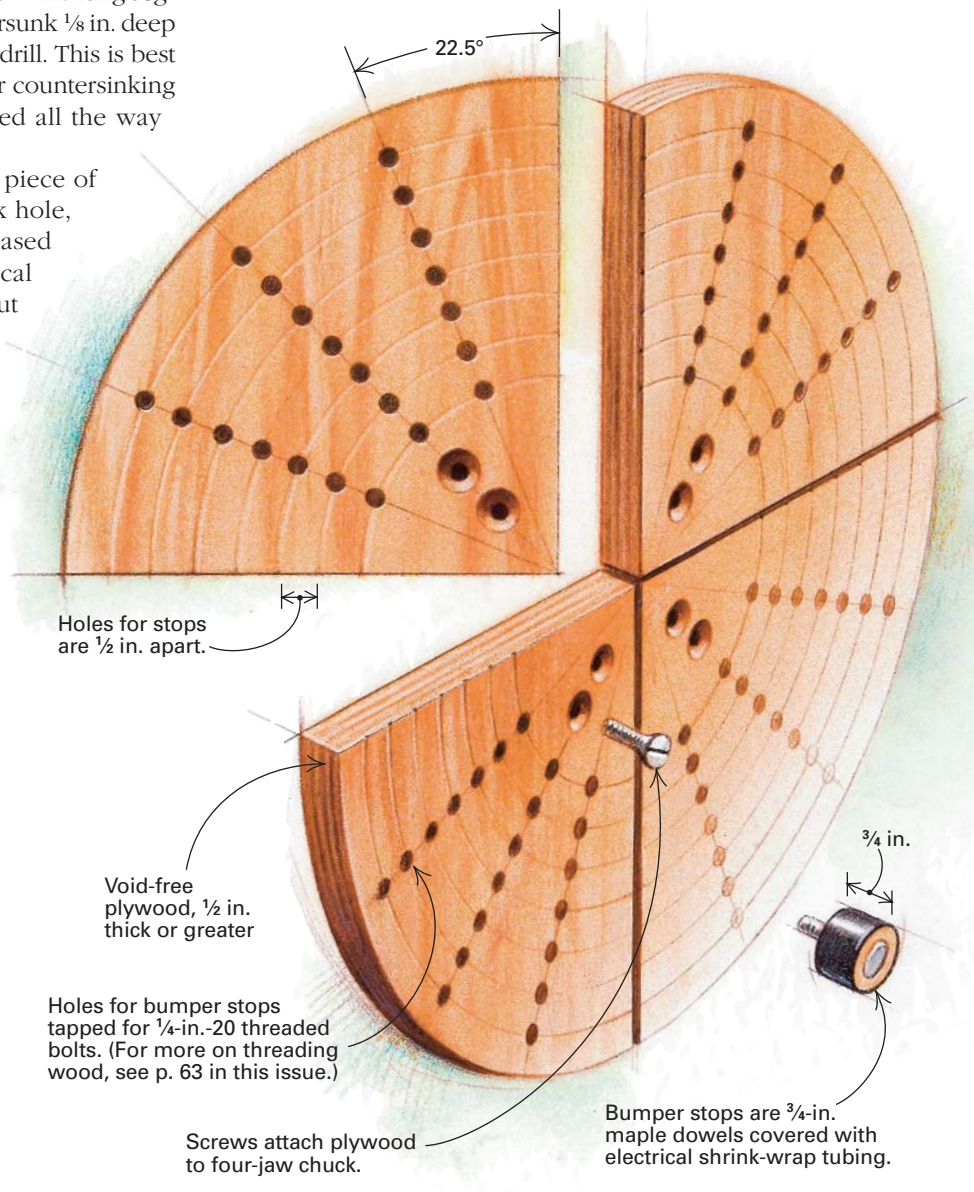
I fit 1⅜-in.-long, ¼-in.-20 bolts through each piece of dowel, recessing the head into the countersunk hole, and glued them in place with epoxy. Then I encased each dowel with a piece of shrink-wrap electrical tubing, which helps grip the workpiece without marring it.

Give the jaws a test run

Assemble the segments on the chuck, and test the operation. You should be able to expand and contract your chuck without the jaws binding. They should also nest together flat when fully contracted. Mount something to the jaws that you know is round, such as a pie plate, to see whether the stops are concentric. If some of the stops don't close in properly, start over using a new piece of plywood. □

Jim Leslie is an amateur woodturner who lives in Calgary, Alberta, Canada.

Screws hold jaws to a lathe's chuck. *The four-piece jaws can be attached to any four-jaw lathe chuck.*



Making the jaws
These jaws will securely hold a turning by its rim, allowing you to finish working on the base. Size the plywood so that the finished assembly is 1½ in. to 2 in. less in diameter than the swing of the lathe.