



The curved
frame and the
carved cabriole legs
come together with
simple joinery

Oval Chippendale Stool

BY RANDALL O'DONNELL

It's real easy to get excited about making a stool like this. Compressed into this little gem are the chief hallmarks of the Colonial Philadelphia chair makers: finely carved feet on graceful legs tenoned into a thin curved frame, topped off with an upholstered slip seat. Less than a handful of original oval stools exist today. To my eye, this Chippendale-style stool commands a presence far beyond the small amount of material needed to build it.

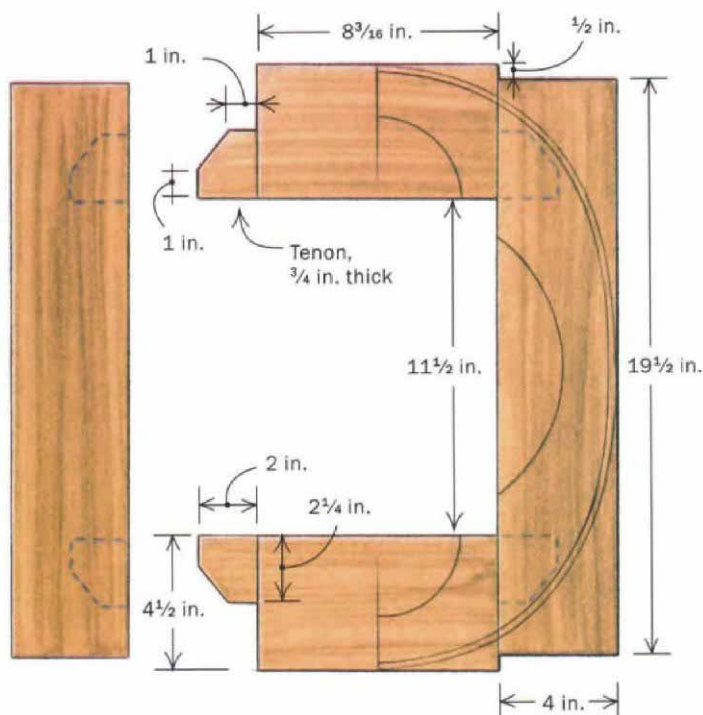
With its curves, carving and fine proportions, 18th-century-style furniture is hard to ignore. Over the years, I've built all kinds of things from wood, but making furniture in this style continues to offer the most satisfying challenge. That challenge lies not just in the cutting and carving but in researching the history and construction details of the piece.

In my part of the country, there are not a lot of original examples of this type of furniture to examine, so to capture the essence of a particular piece, I have to do a lot of homework. First I read all of the related books and magazine articles I can find. Then I travel to check out similar pieces in museums or, if possible, in private



MASSIVE TIMBERS AND SIMPLE JOINERY

This handsome little stool starts as a hefty rectangular frame.



Assemble the frame. The bulk of the frame has been reduced by bandsawing arc-shaped segments prior to assembly.

collections. The research is far more time-consuming than actually making the piece.

This stool is an outstanding example of the Philadelphia Chipendale school of chair making. For chairs with curved seats, Colonial Philadelphia chair makers tenoned the legs up into a stout frame. In most other areas, chair makers tenoned the frame members into the leg the same way a table's aprons are tenoned into its legs; that resulted in a strong joint but a wide frame. The Philadelphia approach sacrificed just a little bit of strength for an elegantly thin frame.

Although making a curved frame and attaching curved legs may appear daunting, the joinery is dirt simple. In this article, I'll describe how to construct the frame and make and carve the legs. I'll also show you a foolproof assembly process and touch on applying the finish.

Make full-sized patterns and a rabbeting template

Start by making full-sized plywood patterns of the seat frame, leg and knee block (for dimensions, see the drawings above and on the facing page). Additionally, you'll need to make a template to guide the router for wasting away material to form the rabbet for the slip seat.

The frame pattern provides the curve of the oval and the mortise location for the leg tenon. To avoid cutting errors, enlarge this quarter-segment pattern to full size and use it to make a complete oval pattern. Mark out one quarter of the oval, and then, using the centerlines as reference marks, flip the pattern over to mark out the remaining quadrants.

I make a plywood router template for rabbeting the frame for the slip seat. When sizing the oval opening in the template, figure in

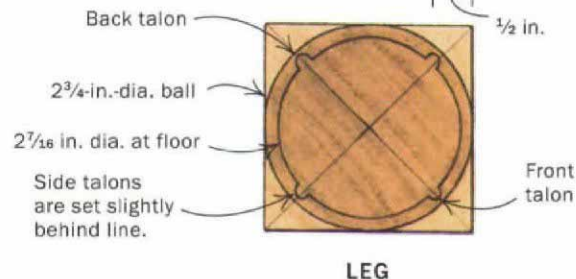
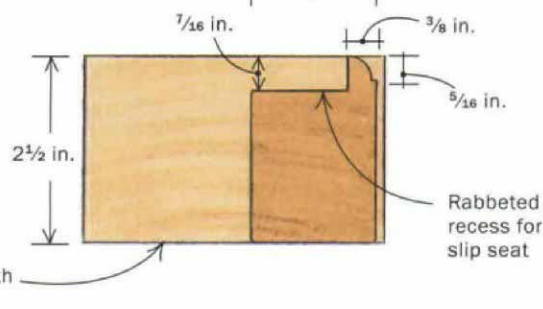
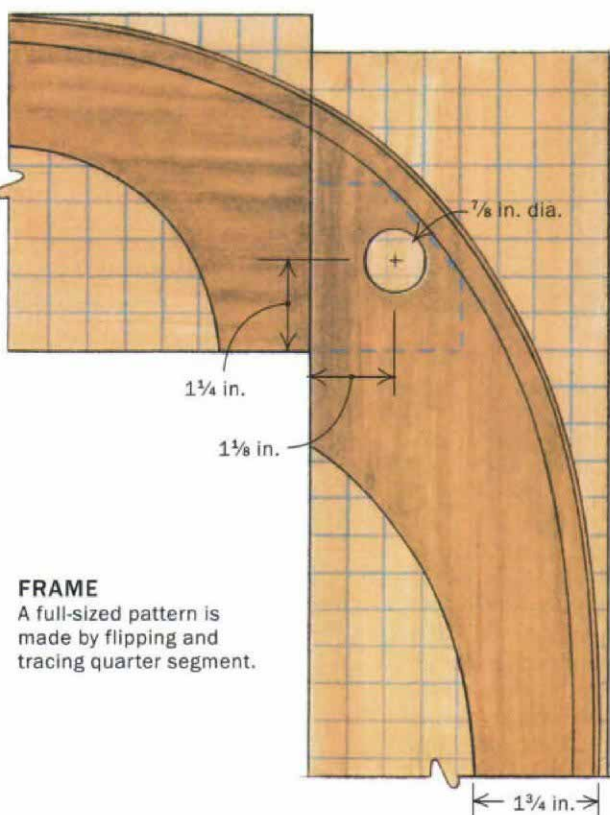
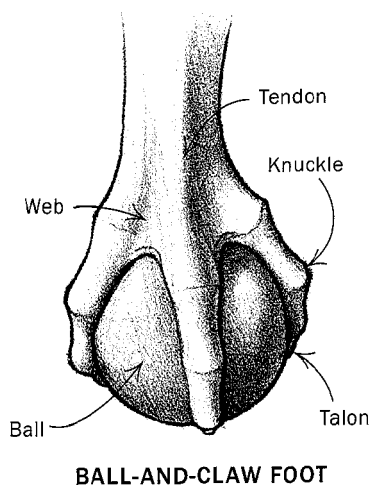
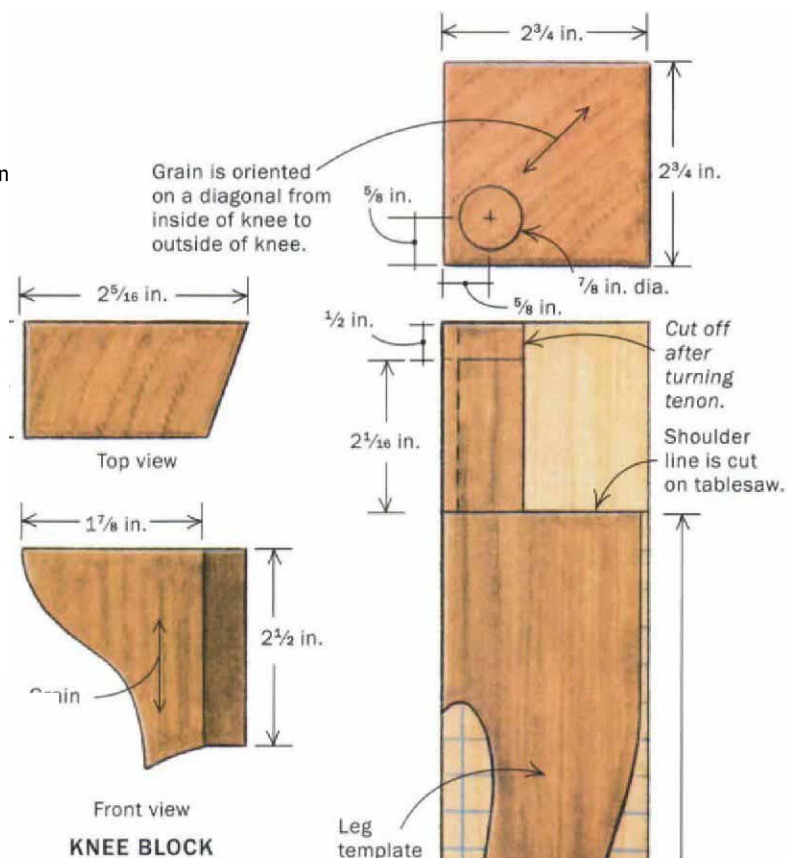
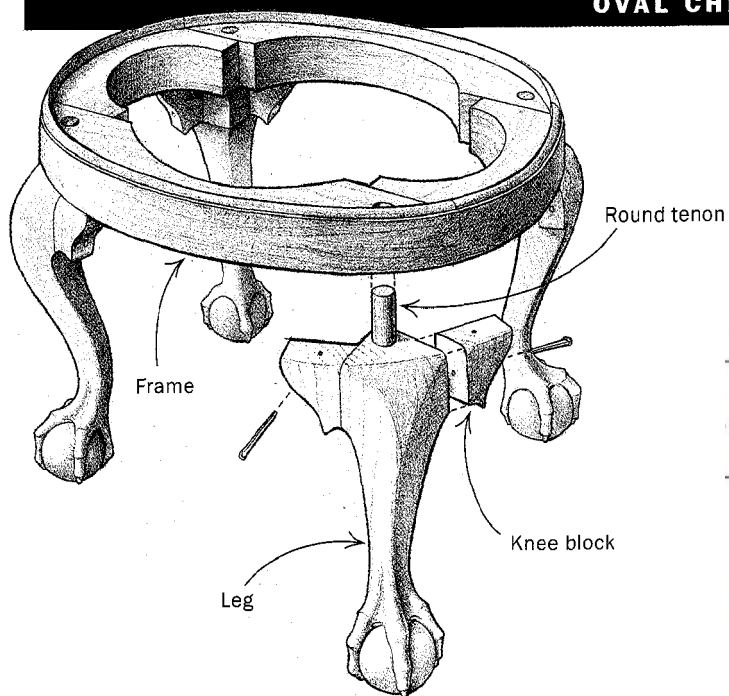


A router makes fast work of the seat rabbet. Use a full-sized oval pattern to establish the layout line.



This gouge is good. To hog away stock the router couldn't reach, the author used a gouge.

OVAL CHIPPENDALE STOOL



the offset between the router bit and the guide bushing you will use to cut the rabbet. Be sure to save the interior offcut from the rabbeting jig. It will be used as a router platform for cutting the bead on the top edge of the frame.

Join a rectangular frame, then shape the oval

It's astonishing that this small stool starts out with timber-frame-sized members. To build the frame, start by milling the stock to 2½ in. thick and cutting the four frame members to size. It helps to orient the frame stock so that the heart side faces down. This orientation results in an arc-shaped grain pattern that rises toward the middle of the frame, which looks much better than a slumping grain pattern.

Referring to the full-sized pattern, mark out and cut the mortises and tenons. For mortising, I use a plunge router to remove most of the waste and hand-chisel the corners and sloping transition in the mortise. A bandsaw makes fast work of the tenons. Again, I carefully pare to the layout line with a chisel.

Many original Philadelphia pieces simply left the inside of the beefy frame rectangular, but I prefer to cut away a lot of the excess

bulk to reduce the mass. Prior to assembly, I bandsaw large arc-shaped hunks from the frame interior.

Now, glue up the frame. Don't worry about clamp marks on the frame edges, because they will be cut away when you saw the oval. After the glue dries, use the pattern to mark out the 7/8-in.-dia. mortises and then drill them.

Some Philadelphia chair makers used a separate, applied lip to house the slip seat because it was more economical. For me, it's easier to make the lip by rabbeting the frame, using a router to waste away the excess stock quickly. Using an exterior template and router guide bushing prevents cutting into the lip. Because the router base is too small to provide adequate support while cutting the area

toward the middle of the frame, I use a gouge to pare away the waste. After rabbeting the frame, saw it to the oval shape on the bandsaw. I use an oscillating edge belt sander to clean up the profile to the scribe line.

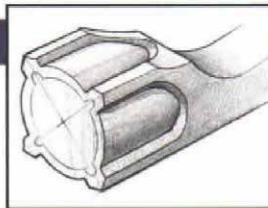
An edge bead on the seat rim forms a neat transition from the frame to the slip seat. The rabbeting template offcut, placed where the slip seat goes, provides the platform for supporting the router. You could use a standard beading bit for this edge bead, but I prefer to end up with a less-machined looking result.

I first make a 1/16-in. rabbet around perimeter of the frame and then round over the top edge with a cabinetmaker's file. Develop the bead by making a series of small parallel chamfers, with the grain, along the perimeter of the frame. I think the slight irregular-



Lighten the load, then turn the tenon. Rough bandsaw the leg, leaving a bridge of material to hold the first cutoff in place. When turning the tenon, use a short tool rest for best support.

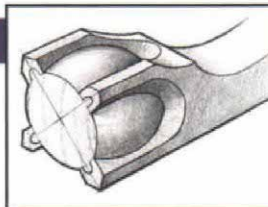
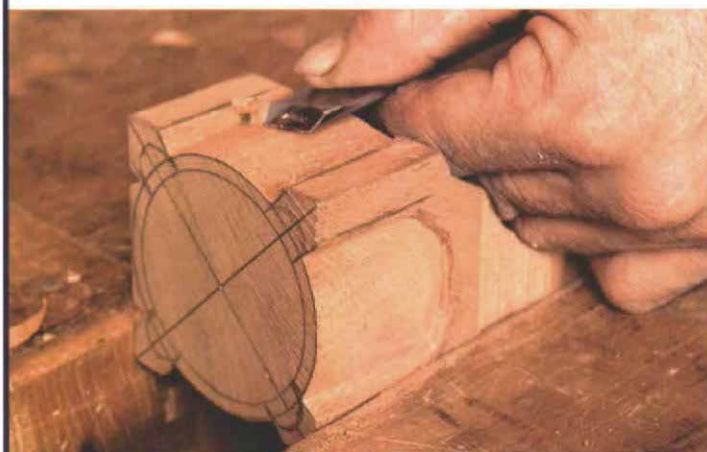
CARVING A BALL-AND-CLAW FOOT



1. ESTABLISH A CYLINDER

Outline the toes with a V-parting tool. Cut to the depth of the larger circle marked on the bottom of the foot.

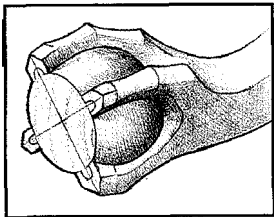
Shape between the toes. Use a #2 gouge and cut to a cylindrical form between the toes.



2. SHAPE THE BALL

Round the top, then the bottom. Carve from the equator toward the ankle with a #2 gouge. Work around the ball to develop a sphere. Then carve down from the equator to shape the bottom of the ball.

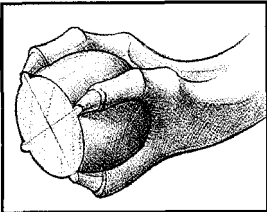
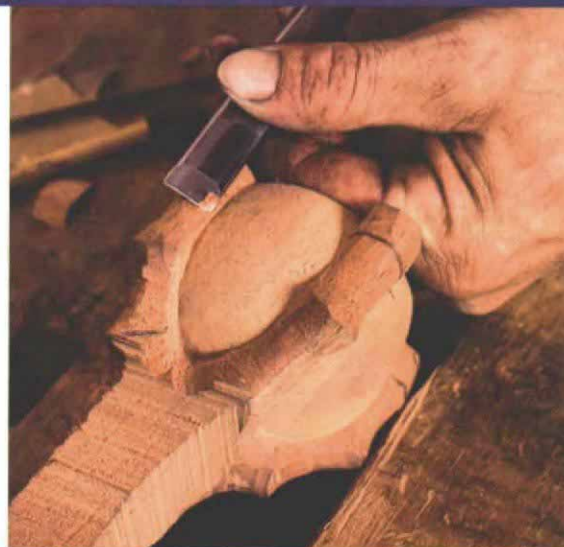




3. LOCATE AND CARVE THE KNUCKLES

Mark the knuckles. The front and side toes have three knuckles; the back toe has two.

Shape the toes. Round over and slightly undercut the toes. The areas between the knuckles are scalloped and thinner than the joints.



4. CUT THE TALONS AND TENDONS

Carve the talons. Taper the talons to about $\frac{1}{8}$ in. at the bottom of the foot. Note that the side talons taper to a point slightly behind the line.

Dennis Preston



Prominent tendons produce a strong-looking grip. Define the tendons and web using a #8 bent gouge. Work up from the ball to the knee.

Four-legged uniformity. Complete each stage on all legs before moving on to the next stage. Use rifflers and sandpaper for a refined foot.



Temporary fixing. With the ball and claw complete, prepare to carve the knee by dry-fitting the leg to the frame. Use screws through the knee blocks to hold the leg in place.



Knee work. With the leg dry-fitted, rough-shape the upper leg, blending the knee to the frame. Final fairing with a rasp is done after glue-up.

ities resulting from this process give an authentic handworked look to the piece.

Bandsaw the cabriole legs, then turn the tenon

The leg material should be sound, straight-grained stock. Cut the 2³/₄-in. square leg billets to size. Allow an extra 1/2 in. of length on the tenon end for the lathe's spur center. It will be cut off after the tenon has been turned. Use a full-sized pattern to mark out two faces of each leg. Orient the pattern on the leg billet so that the resulting leg profiles are knee to knee. Mark the center point of the round tenon on both ends. To define the start of the tenon, cut the shoulder lines at the top of the knee on the tablesaw.

Before turning the leg, cut the cabriole shape on the bandsaw to reduce the leg mass and lathe vibration during the tenon turning. When cutting cabriole legs, I use the bridge method described in *FWW* #117, pp. 82-83, to eliminate the need for reattaching the off-cut stock. Briefly, when bandsawing the first cabriole profile, don't saw off the waste completely. Instead, leave a small bridge between the leg and the waste. This allows you to cut the other side of the leg profile without having to reattach the sawn-away stock. Cut through the bridge after the second profile has been cut.

Once the leg has been rough-cut, turn the tenon. Mount the leg on the lathe with the tenon nearest the headstock. The spinning blur of a leg may look a little scary, but it's quite safe because all of the work is confined to the tenon. Use a short tool rest so there's no chance of getting pinched between the leg and the tool rest.

Carve the feet

By about 1755, the ball-and-claw foot had become firmly identified with the American Chippendale style. The motif is thought to have originated in China as a dragon's claw clutching a pearl. To make the feet for this stool, draw two concentric circles on the bottom of each foot. A 2³/₄-in.-dia. circle is the full diameter of the ball. A 2⁷/₁₆-in.-dia. circle is the ball diameter at the floor. Mark the equator—the horizontal centerline of the ball—5/8 in. from the bottom of each foot. Now, mark the toe outline from the drawing.

To achieve uniformity, carve the four legs together, advancing all four from one stage to the next. I use only a few carving tools to make the feet: a V-parting tool, a #2 gouge, a #8 long-bent or #8

spoon gouge, a rasp and a riffler. The tool numbers refer to the gouge's cutting-edge radius, or sweep.

Start by outlining the toes on the ball using a V-parting tool. Using the #2 gouge and the V-parting tool to refine the outline, cut the ball area to a cylinder by working to the layout line marked on the bottom of the foot. Then smooth this area with a rasp to produce a nice, uniform surface. With the #2 gouge, round the top area of the ball, working from the equator and deepening the toe-to-ball junction with the V-parting tool. Be careful not to remove any stock from the center point of the equator—this is the basic reference for the ball diameter. Round the lower half of the ball, working down to the inner circle. Keep referring to the other three surfaces between the toes to maintain the spherical shape. Once you have the ball rounded, smooth it with a riffler.

Now, mark out the toe joints: three on the front toes and two on the back. Round over the toes, slightly undercutting them at the ball surface. Scallop and thin the toes between the knuckles, making the knuckles more prominent. Once the toes have been defined and rounded, mark out the talons 1/2 in. from the bottom of the foot—Philadelphia-style ball-and-claw feet tend to have rather stubby talons. Note that even though the side toes are forward at the centerline for most of their length, their talons taper to a point slightly behind the centerline. The front and back talons are aligned on the centerline. Taper the talons to about 1/8 in. dia.

Now comes the part that really gives a feeling of tension in the foot: cutting the web and defining the tendons. Use a #8 long-bent gouge and start defining the extent of the tendons. Work from the ball up toward the knee, leaving the web proud of the ball by about 1/16 in. Smooth the carving with rifflers and small pieces of sandpaper. Shape the leg from the ankle to the knee with a rasp and rough-sand the lower leg and foot. The upper leg will be shaped and faired to the frame in the next step.

Fit the knee blocks and fair the upper legs

The knee blocks make the visual transition from the legs to the frame and buttress the joint. Fitting knee blocks to a curved frame is somewhat different from the usual rectangular frame because the blocks flare away from the leg to meet the frame.

Dry-fit the legs into the frame, aligning the flat knee-block sur-



Glue the legs in the frame. The knee blocks temporarily screwed to the frame ensure that the legs go back in the same position. The knee blocks are glued in place after the leg glue joint has started to set.

face of the leg parallel to the frame's joint line. Now, screw the knee blocks in place to hold the leg in this position for rough shaping the upper leg. Be sure to mark the legs and knee blocks so that you can return them to the same positions on the frame. Carefully remove the legs without disturbing the knee blocks.

Finish up

With the knee blocks still screwed in place, glue the legs to the frame. Once the glue has started to set (about 10 minutes), remove the knee blocks, one at a time, apply glue and screw them back in place. After the glue-up, replace the screws in the knee blocks with hand-forged nails for authenticity.

After the glue dries, use a #2 gouge and a pattern maker's rasp to blend the curves of the upper legs and knee blocks into the frame. The final smoothing is done with sandpaper, starting at 100 grit and ending with 180 grit. Sponge with water, then give the surfaces

a quick hit with 400-grit paper to remove any raised wood fibers.

Susy, my patient wife, does the finishing and really gets the wood's figure to pop. She colors the wood with red mahogany aniline dye, followed by a washcoat of shellac. Two separate applications of paste filler with a black tint, spaced a day apart, follow. Finally, several coats of buttonlac shellac topped off with Behlen's violin varnish make the stool glow.

Crowning this regal little stool with a silk damask-covered slip seat completes the project. I make the frame, and an upholsterer does the webbing, padding and fitting of the fabric. To make the frame, I simply join a rectangular assembly of poplar, bandsaw it to the oval shape $\frac{1}{8}$ in. smaller all around than the seat recess and cut a heavy chamfer around the top outside edge. □

Randall O'Donnell makes period-style furniture at his shop in the countryside near Bloomington, Ind.