

The choice is yours

Bob Chapman creates a flexible, moveable sculpture that allows for a myriad of configurations

PHOTOGRAPHS BY THE AUTHOR



Ray Key asked me if I would be willing to do a presentation at the 2007 AWGB seminar at Loughborough University. As it happened, I'd designed and made three pieces which I intended to put in the instant gallery at the seminar and one of these I'd described as an 'interactive' piece. I'm trying to design turnings that involve the owner or viewer in making decisions about how the piece should be configured and displayed effectively.

To achieve this, the turning must have some moveable parts, but I wanted to avoid a 'set' of individual pieces. I wanted the parts to be inextricably linked in a single unit but still to retain sufficient flexibility to allow different configurations.

After some experimenting I made the first successful piece, which I called *Married Quarters* because it consists of a bowl cut into quarters, permanently but flexibly linked together by rings.

By making the bowl within a square, I designed it to incorporate flat sides for the parts to stand on. Size is also a much greater constraint than might be imagined. Geometry dictates that the connecting rings must have a diameter equal to the diameter of the bowl. If the bowl was too large, the rings would allow the parts to move so far apart that the essential sense of 'togetherness' would disappear and the piece would lose its impact.

From the comments I received afterwards, the presentation was well received and in this article I have made a copy of the original piece in order to show the whole process in greater detail.

In this example the bowl is made from a piece of cherry (*Prunus avium*) approximately 150mm (6in) square by 30mm (1¼in) thick, which I happened to have in the workshop. The rings are made from holly (*Ilex sp*) but, as they are to be painted, any fine-grained timber would do just as well.

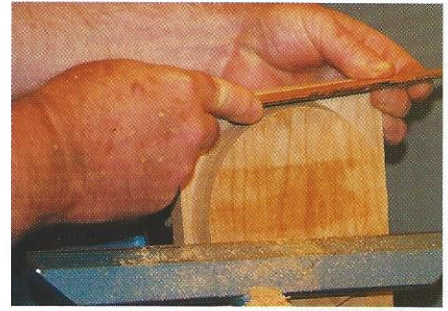
The quarters



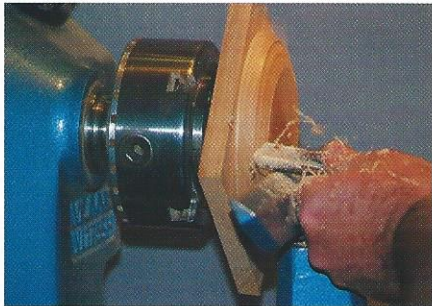
1 Mark the diagonals to find the centre and drill a hole for the screw chuck. Don't drill the hole any deeper than necessary for the screw



2 With the blank mounted on the screw, the corners are taken down (see cutting corners sidebar)



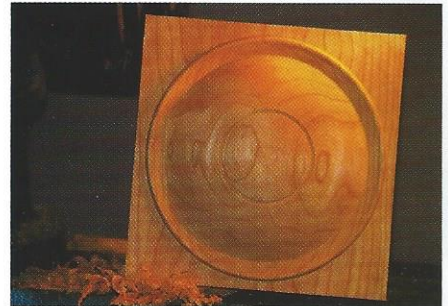
3 As you reduce the thickness of the blank at the corners, check the edge for straightness



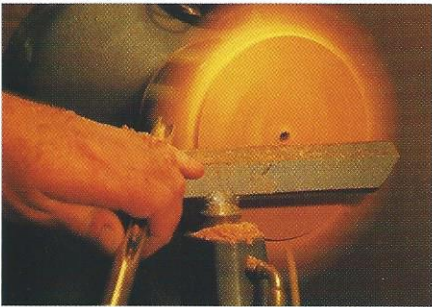
4 With the square part of the blank reduced to about half its original thickness, you can shape the bowl. Form a bead around the outside and complete the bottom of the bowl as a smooth shallow curve



5 Using the long point of a skew chisel, cut a chucking groove into the bottom of the bowl at a diameter to suit the jaws of the chuck. It is essential that this is as shallow as possible but deep enough to hold the bowl securely; 2-3mm ($\frac{5}{16}$ - $\frac{1}{4}$ in) should be sufficient



6 Here the shape of the bowl bottom and the chucking groove can be seen more clearly. At this stage no attempt is made to sand or polish the bowl, and the finish is straight from the gouge. Note that the centre spot of the bowl should be visible. If it isn't, mark it with a pencil before removing it from the screw



7 With the blank now reversed and held in the chuck, the square corners are reduced until the thickness is down to around 6mm ($\frac{1}{4}$ in)



8 Again, form a bead to mark the edge of the bowl. Take care to match its position to the bead previously formed on the other side. This makes a more attractive profile when the bowl is eventually cut



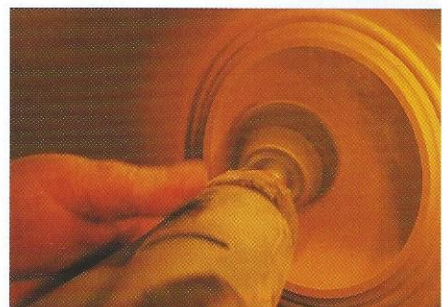
9 Using a 6mm ($\frac{1}{4}$ in) flat gouge (see page 53, Flat gouge sidebar), remove a quadrant from the bowl edge. Later this will form the groove to accommodate the ring



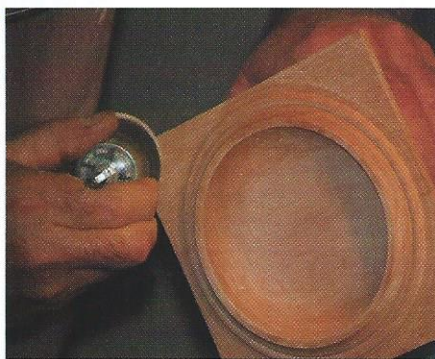
10 Check that the upper surface of the bowl's rim is perfectly flat and level



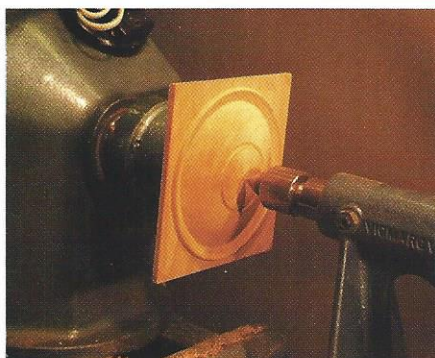
11 Proceed to hollow the bowl, maintaining an even wall thickness of about 6mm ($\frac{1}{4}$ in)



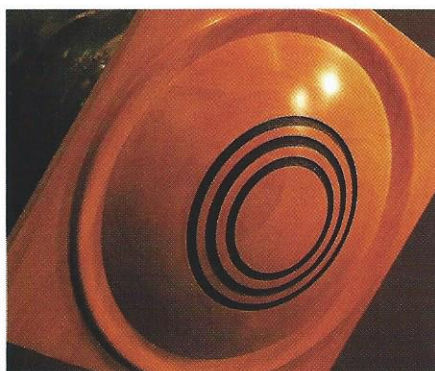
12 Power sand the inside, starting with 120 or 180 grit and working down to at least 400 grit



13 Power sanding the corners would certainly round them over, so they must be hand sanded with the lathe off. Again work down through the grits to about 400 grit



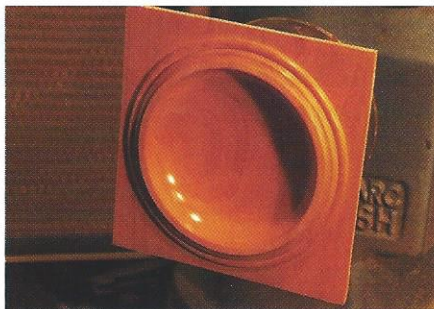
16 The bowl is now reversed onto a home-made vacuum chuck (see page 53, Alternatives) in order to re-work the outside



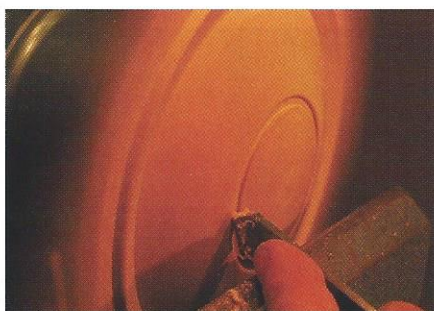
19 When the paint is dry, sand the entire surface down to 400 grit, sealing and polishing as before



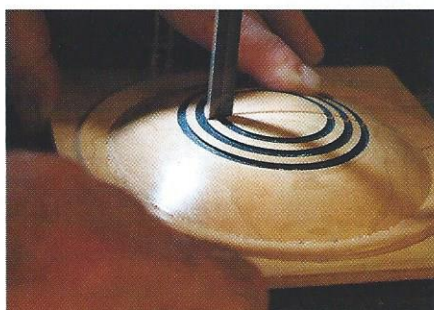
22 After smearing a thin layer of PVA adhesive on both surfaces, press the halves firmly together and leave until the glue sets. It is not necessary to clamp them



14 The bowl is sealed and polished. I use beeswax and Carnauba wax on the bowl, applied and buffed with the lathe on, but the corners must be done with the lathe off. Take care not to get sealer or wax on the upper face of the rim as this would interfere with the glue joint later



17 Using a narrow parting tool, the chucking groove is converted into a square form groove about 2-3mm ($\frac{9}{64}$ to $\frac{1}{16}$ in) deep. Similar grooves are equally spaced either side so that the original purpose of the groove is disguised



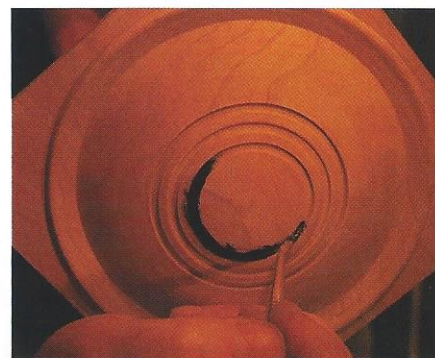
20 Mark the halfway point on one edge of the bowl, set the bandsaw fence at the correct distance and saw the bowl in half. Hold the bowl firmly but take care to keep fingers away from the blade. Leave the fence as it is, ready for the next cut



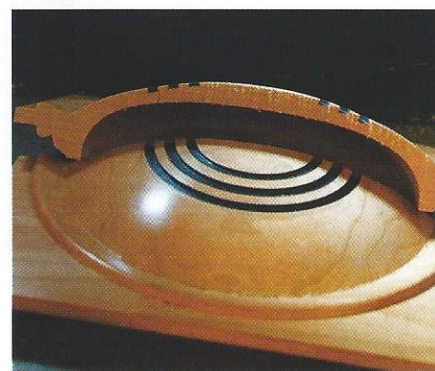
23 With the glue set, the sawn edges can be sanded smooth...



15 Measure the inner diameter of the ring groove, and write it down. In this case it is 117mm ($4\frac{11}{16}$ in)



18 Paint the grooves with black acrylic paint, taking care to get as little as possible on the surface. Make sure the sides of each groove are painted, not just the bottom

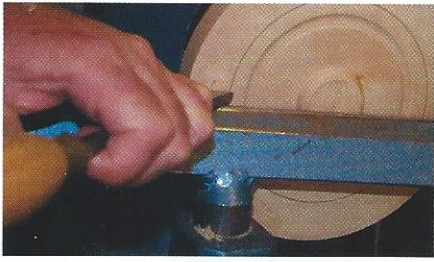


21 First sight of the profile of the piece reveals a fairly even thickness



24 ... then it's back to the bandsaw to cut the assembly in half again. The newly sawn edges are again sanded and all the edges are sealed and polished.

The rings



25 A small holly bowl blank is mounted on a screw chuck and a circle of diameter 117mm (4 $\frac{1}{2}$ in) is marked out. The beauty of using a bowl blank is that the ring is formed from the part to be removed as waste, so it can still be used for making a bowl



26 The ring is formed using a 3 in 1 captive ring tool from Craft Supplies



27 120 grit paper is used to sand the ring before its final parting-off



28 The rest is moved and a narrow parting tool is used to make the final parting cut. This gives a high success rate. Alternatively the ring can be parted off with the captive ring tool, but the ring tends to get trapped between the tool, timber and rest, and, more often than not, ends up broken



29 The ring is always left with a narrow fillet where it was parted off. This is easily removed by hand sanding



31 Assuming the ring is a snug fit, glue it into the groove in the quarters (see page 53, Oops!). Repeat steps 25 to 31 for the second ring



30 The rings are sealed with sanding sealer, rubbed down with steel wool and sprayed with black cellulose spray paint. Several coats are needed for complete coverage



32 If you feel around one of the rings, testing its flexibility, you will soon identify the short grain section of the ring. A sharp snap here will break the ring in a clean break. This allows the two rings to be linked before repairing the break with a tiny drop of Superglue



Cutting corners and full drawings

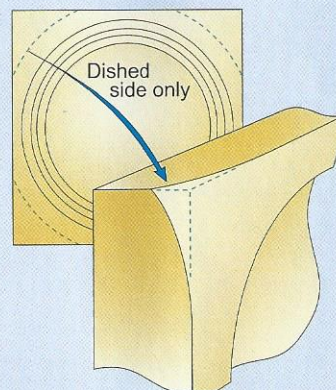
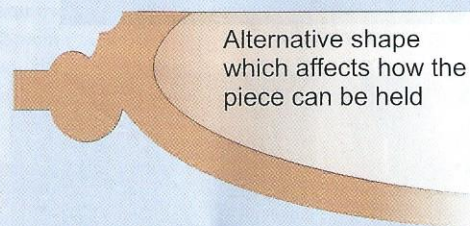
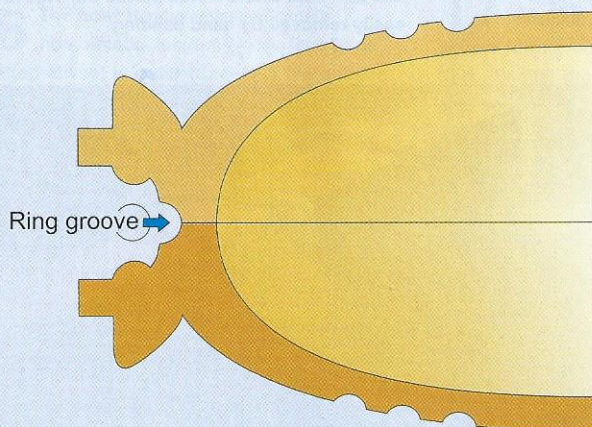
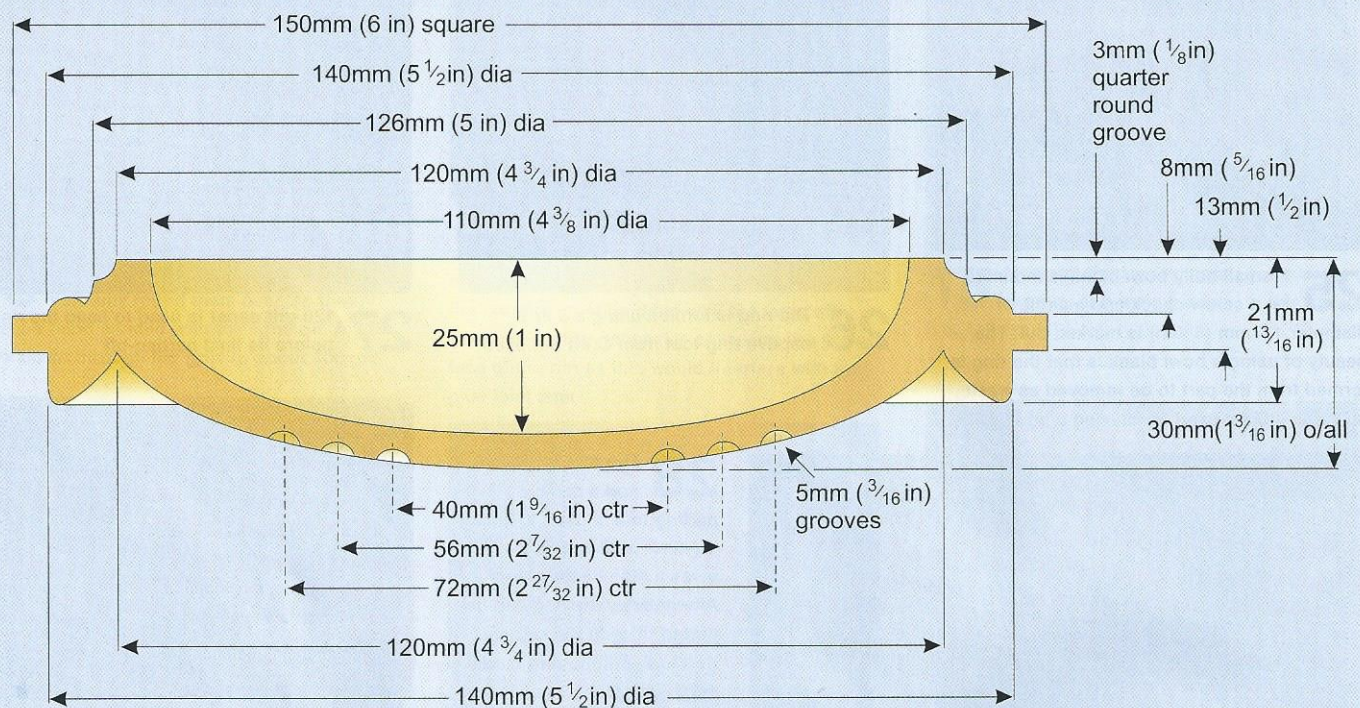


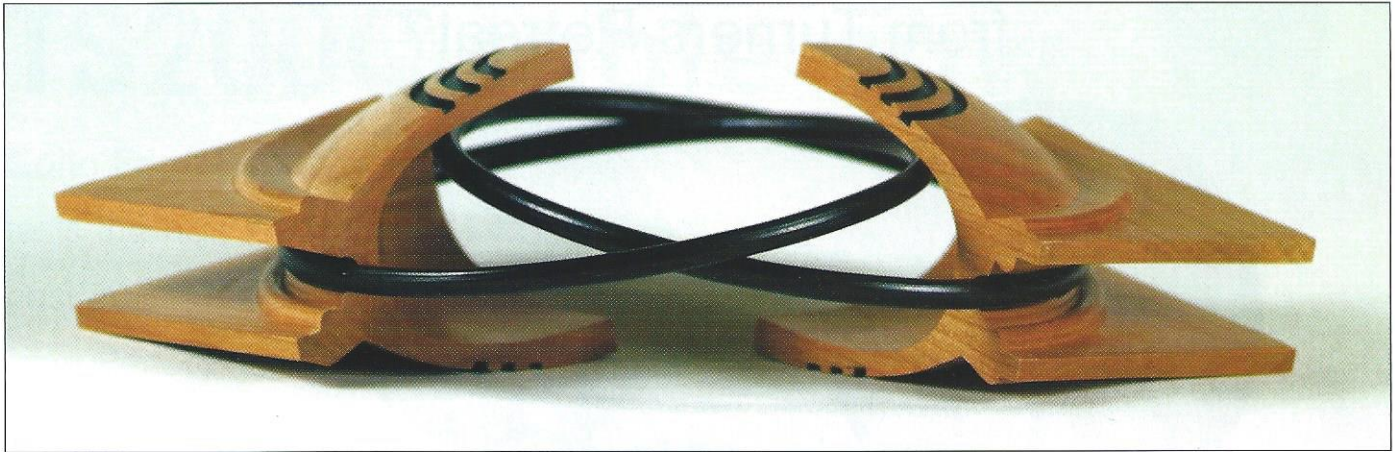
Diagram 1

When turning a square blank the gouge will only make contact with the corners four times in each revolution, **diagram 1A**. These four brief cuts offer little resistance to the tool and so there is a tendency for the cut to go deeper than intended.

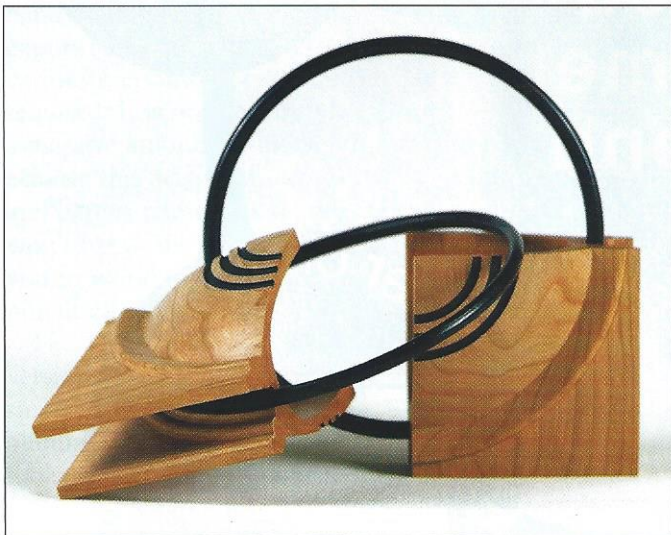
However, as the gouge is moved inwards towards the centre the resistance gradually increases and the depth of cut gradually decreases until the tool is in a position where it cuts continuously for the whole revolution of the workpiece.

As a result, if an even pressure is maintained on the gouge throughout the cut it will inevitably remove more wood from the corners than nearer to the centre. This causes the corners to be eroded, leading to a curved edge on the bowl, **diagram 1C**.

To combat this tendency the pressure on the gouge must be increased as it gets nearer to the centre. It's quite difficult to manage this increase in pressure, and it takes practice to get it right. I find it easier to control an increase in pressure as I move the gouge inwards but others find it better to begin the cut on the solid wood near the centre and decrease the pressure on the tool as they move outwards.



"I'm trying to design turnings that involve the owner/viewer in making decisions about how the piece should be configured and displayed"



33 The finished piece in different configurations ■

Flat gouge

I don't sharpen or use scrapers in the traditional way. After grinding them on the wheel to about 45° I turn the tool over on an oilstone and deliberately remove the burr. This leaves a honed edge which is probably sharper than most of my other tools which are normally used straight from the grinder.

In use I angle the tool upwards, **photo 9**, and use it with the bevel rubbing just as I would with any other tool. They certainly aren't scrapers any more and I call them 'flat gouges'. Used in this way they are wonderfully controllable, give an excellent finish and retain their sharp edge very well.

Alternatives

In order to centre the bowl on the vacuum chuck easily, mark the centre of the bowl so that it can be aligned with the tailstock centre point. If you do not have a vacuum chuck, use the alternative bowl design shown. The undercut rim will allow the bowl to be held by expanding the (suitably padded) jaws of a scroll chuck inside the rim.

Oops!

In this case the ring groove was too narrow to take the ring (see **photo 31**), but the fault was easily corrected by enlarging it slightly with a round file. Glue the ring in place by running a few drops of superglue into the groove and pushing the ring on top of the glue. Take care, as superglue softens the black paint very quickly and any movement of the ring now will smear paint over the piece and spoil it. I use clothes pegs to hold the ring in place until it has set thoroughly.