# Lighthouse box

Walter Hall's lighthouse stands on burr elm 'rocks'

Because I am known as a pen-maker, other woodturners often give me offcuts of interesting timbers that are too small for other projects to cut down into pen blanks. The piece of Scottish wych elm (*Ulmus glabra*) burr that forms the 'rocks' for this project was given to me by my friend John Hodgson RPT and was really too thin to get pen blanks out of, so it has been gathering dust in my workshop awaiting inspiration.

Now I am not an artistic turner, I much prefer to make practical items, but I looked at this little burr and thought 'you look like an outcrop of rocks' – and the obvious thing for a coastal dweller such as myself to do with an outcrop of rocks is build a lighthouse on it. But how to make a lighthouse into something practical? Well, the obvious thing was some sort of box and thus the idea for the project was formed.

The lighthouse is intended to be a generic representation of a typical lighthouse rather than being slavishly modelled on any particular original, so it draws on my research of many images of lighthouses far and wide. It is not intended to be anything other than a useful ornament in the form of a lighthouse. Other lighthouse ideas that could be based on this project with some modification could include children's building block toys, pepper mills or even table lamps.

The burr base is optional but in my opinion it raises the project a little out of the ordinary, so it is worth seeking out an offcut if you can. The base will need to be flat. The piece I used was sawn quite flat and only needed tidying up on a belt sander.
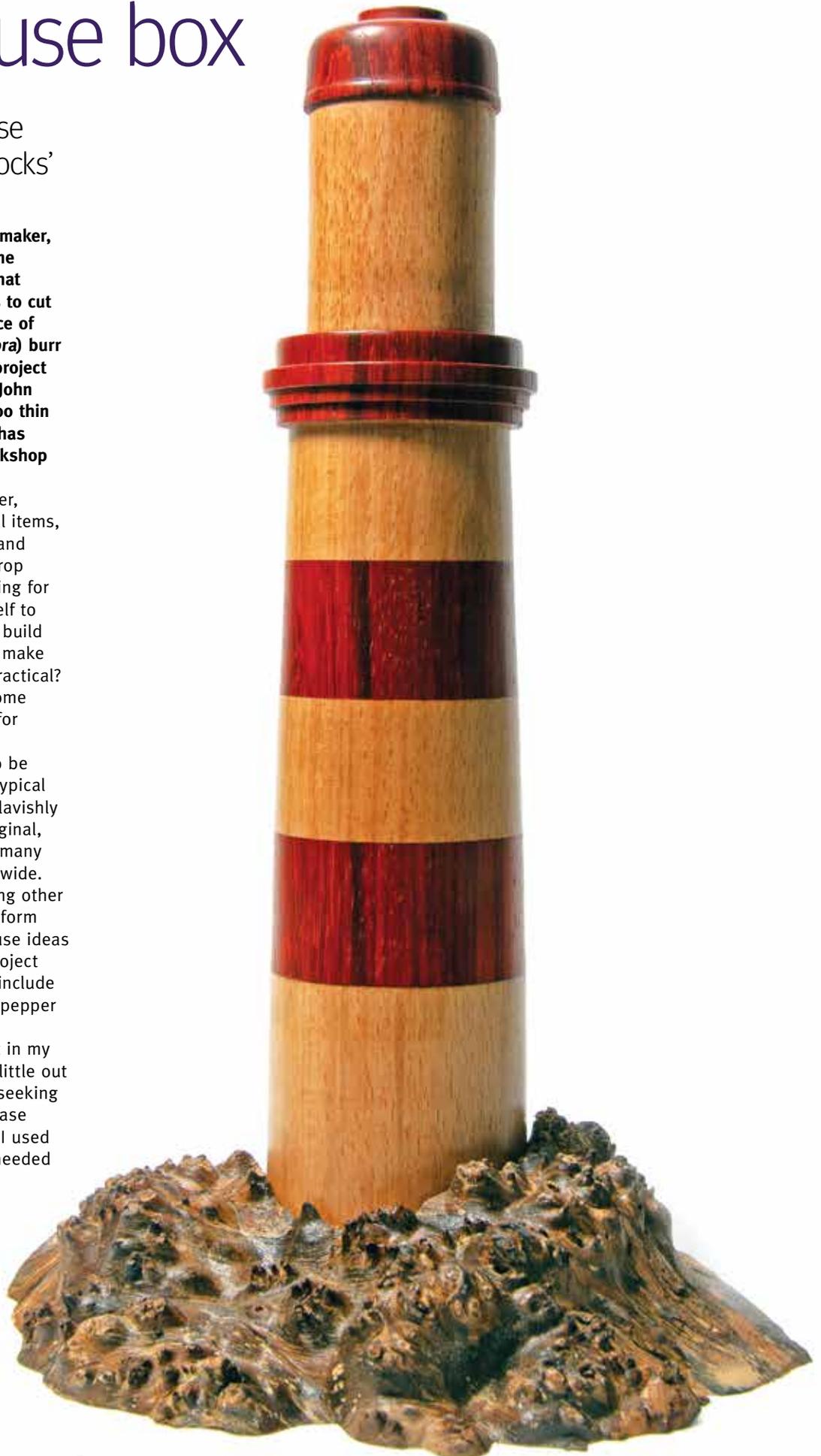
TOOLS AND MATERIALS
- Personal and respiratory protective equipment (PPE & RPE)
- Spindle roughing gouge
- Skew chisel
- Beading and parting tool
- Narrow parting tool
- Box scraper
- Pillar drill
- Large Forstner bit or adjustable TCT boring bit
- Cramps
- Drill chuck
- Forstner bits

MATERIALS
- Beech (Fagus sylvatica) spindle blank 75mm square minimum 250mm long
- Padauk (Pterocarpus soyauxii) spindle blank 75mm square minimum 150mm long
- Offcut of hardwood burr
- Wood adhesive
- Abrasives 120 to 400 grits
- Cellulose sanding sealer spray
- Acrylic satin lacquer spray

Diagram labels:
4mm ($^5/_{32}$in)
28mm (1$^1/_8$in)
35mm (1$^3/_8$in)
42mm (1$^{11}/_{16}$in)
50mm (2in)
20mm ($^3/_4$in)
31mm (1$^1/_4$in)
28mm (1$^1/_8$in)
280mm (11in)
31mm (1$^1/_4$in)
31mm (1$^1/_4$in)
31mm (1$^1/_4$in)
62mm (2$^1/_2$in)
62mm (2$^1/_2$in)
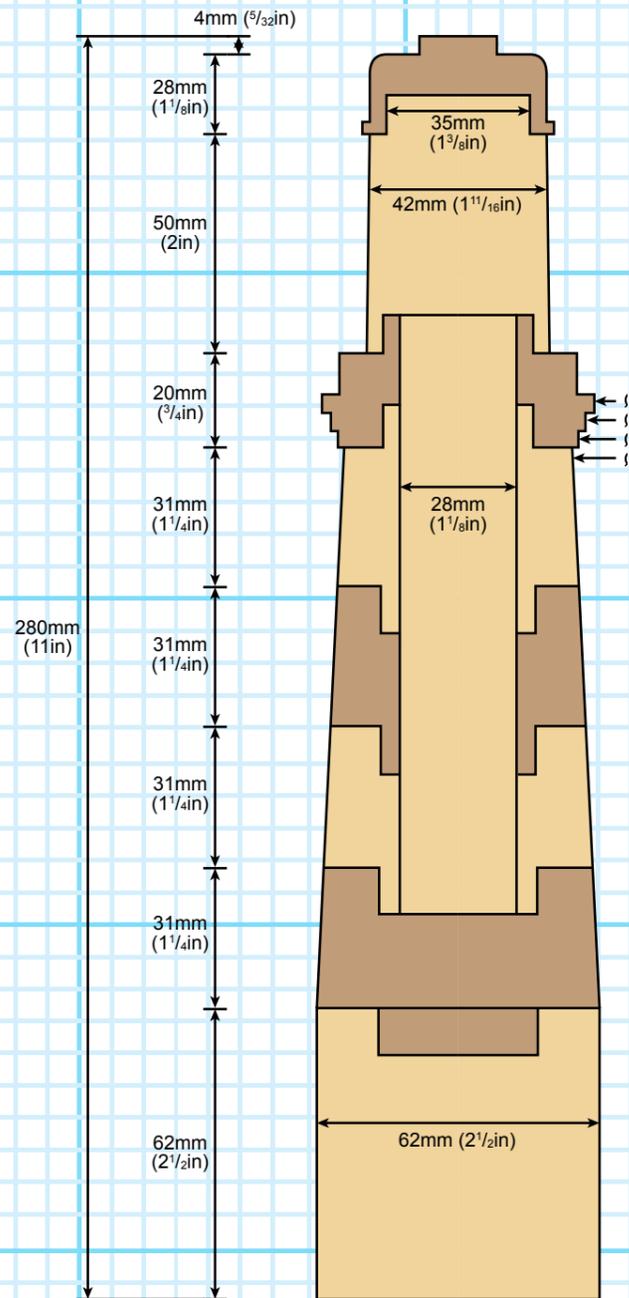
The base
1 Prepare a recess for the bottom of the lighthouse. I used a pillar drill fitted with an adjustable TCT boring bit. Whether using a bit like this or a large Forstner bit, common sense dictates that the work be clamped securely in place and that in no circumstances should the work be hand held. To do so invites injury.

The main body
3 Attention can be turned to preparing the spindle blanks that will form the body of the lighthouse. Mount your timber between centres and, using a spindle roughing gouge, turn down to a cylinder, checking regularly with callipers to achieve the exact diameter required.
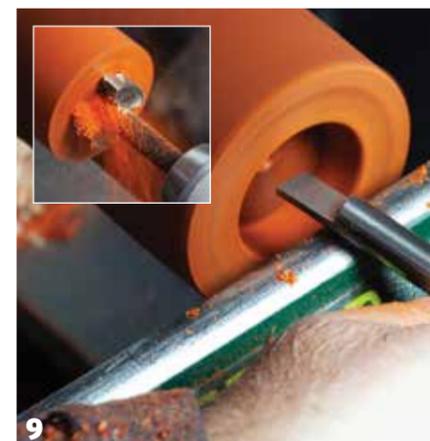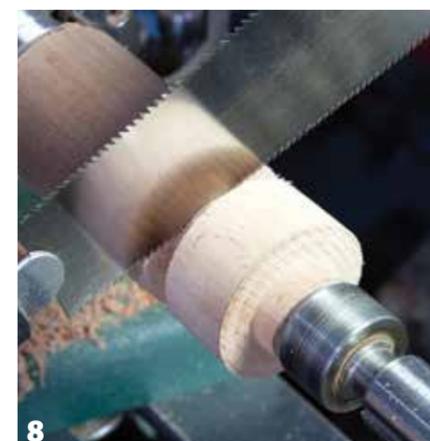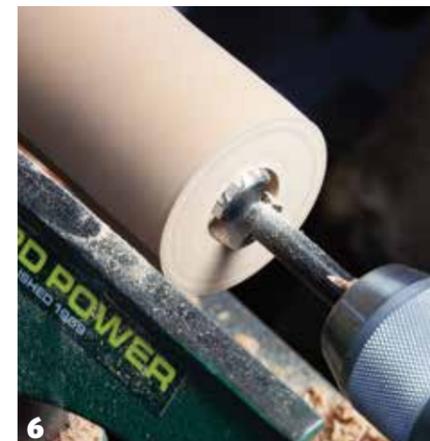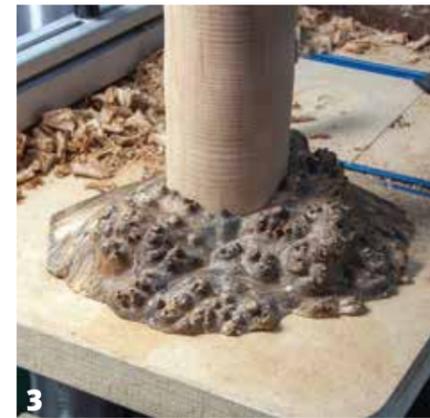
3 Check the fit with the prepared base. At this stage it should be a tight fit so that, once tidied up and sanded, there will be sufficient clearance to form a good, close-fitting glue joint. (N.B. The ridges in the cylinder are caused by me moving the gouge too quickly across the surface of the work.) Prepare the padauk blank in the same way.

4 The next stages require the work to be held in a chuck. To prepare for this, measure your chuck jaws and cut an accurately-sized spigot using a beading and parting tool. Next, square off the end of the blank so it will sit square in the jaws.

5 With the work mounted in the chuck and supported with a tailstock revolving centre, measure and part off a section that will form the 'light' at the top of the piece. Use a thin parting tool to cut almost all the way through then finish the cut using a fine saw with the lathe turned off.

6 Now proceed to make each of the body sections. With a tailstock drill chuck, a suitably sized Forstner bit in the tailstock and the speed turned down to about 400rpm carefully drill to depth for the first section. With some sections you will need to drill the 10mm-deep mortise first (check drawing for each section).

7 Mark out the tenon or tenons for each piece and size them using the beading and parting tool and callipers. The sections are joined with mortise and tenon joints because butt-jointed end grain would give very weak joints. Accurate sizing and clean, square cuts are needed for close-fitting joints.

8 Once each piece is completed, stop the lathe and part it off using a fine-toothed saw. Slacken off the tailstock slightly to prevent the saw sticking. N.B. Using a parting tool for this job could cause breakout as the tool cuts into the pre-bored centre.

Contrasting sections
9 Once all the parts have been cut from the beech blank, mount the padauk blank – which creates a colour contrast to the beech – in the same way and, following the dimensions in the drawing, drill as required and form the mortises and tenons at each end with the beading and parting tool. Any close-grained contrasting timber will be fine. Alternatively, stain timber to create a colour contrast.
The bottom padauk section will form the bottom of the inside of the box. Even though it will not be seen, I like to finish the bottom square and remove the recess caused by the spur of the Forstner bit. If you choose to do this an angled box scraper like this home made tool is perfect for the job as it gets right into the corner of the recess.

10 Once all the parts are cut to shape, check the fit and make any adjustments so that there are no gaps or other problems when it comes to assembly. Coat one surface of each mortise and tenon joint with a good-quality wood glue and assemble the main body of the lighthouse. Do not fit the top (collar) section of the body at this stage.

11 Clamp the assembly, ensuring even pressure so that it dries square and with the joints evenly closed. Leave the work in clamps for however long is recommended for the adhesive you have chosen. Do not be tempted to proceed with the next stage too soon. Experience tells me that glue joints stressed before they are cured will ultimately fail.

12 Once the glue is set and the assembly is sound, remount the work between centres and turn the outside of the lighthouse body to shape. Initial shaping can be done with a spindle roughing gouge, but finishing cuts with a skew chisel with give a fine finish that may eliminate, or at least reduce, the need for sanding.

The final touches

13 With careful planning and measuring you should have sufficient of the padauk blank left in the chuck to prepare and part off a section to make the cap at the top of the light section. Carefully size the tenon, rough down the top section to size and part off.

14 The section of beech that was removed at step 5 can now be mounted between centres, a chucking spigot cut and then mounted in the chuck to roughly shape the 'light' section. This will also need to be drilled through (or at each end) to form the mortise for the cap and the box joint with the body.

15 Glue the cap and light sections together and clamp up as before. Once set they can be mounted between centres and turned to final shape. Now mount the collar section in a chuck or jam chuck and carefully fit the box joint, taking fine shavings as necessary to get a good fit between box and lid sections.

16 The completed collar can now be glued and clamped into the mortise at the top of the body. If you need to sand the body you can do this before adding the collar. When sanding contrasting timbers, a coat of spray sanding sealer before starting work and between each grit can help prevent cross-contamination from sanding dust. A tack cloth between grits also makes for a better job.

17 The choice of finish is up to you and there are many suitable alternatives. If the piece is to be used as a box and subjected to frequent handling then I would recommend a good-quality lacquer. I used acrylic satin lacquer sprayed with the work mounted on the lathe but the lathe turned off.

18 The finished piece ready for the windowsill or mantel shelf, I have thought about pyrographing lines on the light section to represent the frames of the glass but remain undecided. I have found the tall, narrow box to be ideal for storing a stash of £1 coins, but don't tell Mrs Hall where I have hidden them. ●