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WOODWORKING
CRAFTS

Issue 63

WELCOME

As usual this issue of your *Woodworking Crafts* is jam-packed with a wide variety of projects for you to build, new skills to learn and traditional techniques to perfect.

Make a library ladder to access high bookshelves; a rustic stool inspired by a vintage woodturning manual; or a step cupboard that provides a clever storage solution. Learn the technique of cutting the perfect circle; how to build and use a dowelling jig or repair those damaged, upholstered chairs. Or why not inspire the next generation of crafters by making some willow balls with the kids.

The second part of our pyrography course will develop your expertise, while elsewhere you can learn how to turn handles for furniture, maintain your bandsaw blade and use a honing guide to improve your tool sharpening.

We also introduce the craftsmanship of furniture maker Bobby Mills, find out what's on offer at the Boat Building Academy and visit the lovingly restored Willow Tea Rooms in Glasgow, one of Charles Rennie Mackintosh's greatest creations.

Unfortunately we have to share the sad news that Murray Taylor passed away shortly after submitting his article on box joints. All of us at *Woodworking Crafts* would like to offer our condolences to his wife, family and friends. His passion and enthusiasm for woodwork was inspiring and we'll miss him, and the projects he was never able to share.

We hope you enjoy this issue, and don't forget to show us what projects you've been making during the lockdown: we're on Instagram @woodworkingcrafts

Contents

Issue 63

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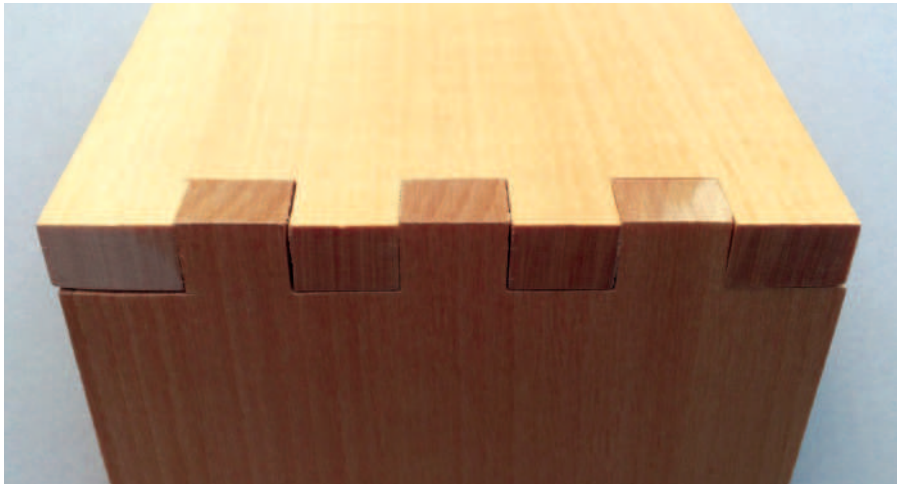
Cover photograph: Abdollah Nafisi
Welcome page photograph: Francesco Cremonini and Giacomo Malaspina

Woodworking is an inherently dangerous pursuit. Readers should not attempt the procedures described herein without seeking training and information on the safe use of tools and machines, and all readers should observe current safety legislation.



WOODWORKING CRAFTS

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STAIRCASE STORAGE BOX

Francesco Cremonini's space-saving storage solution can be built with only a few tools

When looking for ways to increase storage in the house, it's always worth looking at small, unused spaces and considering using them in innovative ways. In this instance, the need to insert a step connecting two floor levels proved to be a perfect opportunity to add more storage.

I decided to build a container to store magazines, CDs, toys and other things that usually end up scattered around the living room. The box can be made using a limited range of tools. It uses man-made panels precut to size. The various components are edged with veneer, then joined together before making the movable lid and fitting a lock. No sizes are given as every situation is different. Use the existing stair step heights in your house as a guide.

PHOTOGRAPHS BY FRANCESCO CREMONINI

1 The raw materials, blockboard and thick veneers **2** Marking a line along the blockboard to cut to size **3** Sawing cross grain using a board offcut as a saw guide **4** Using a block plane to obtain a clean straight edge

The project

The box shape has three visible panels corner bevel jointed at 45° to maintain continuity of the surface veneer designed to mimic the appearance of solid wood. The rear panel is fitted perpendicular to the sides, set slightly forward to allow a good fit against the wall. The inside of the case is veneered in walnut, which gives a pleasant contrast with the afzelia veneer used for the exterior. These were chosen to suit the rest of the room, you can choose any combination of species you wish. The combination of the two woods is emphasised in the lower part of the lid where tropical hardwood frames the temperate wood. The cover is not full width because it is hinged to one rear cross member, the point of rotation is set forward to allow the lid to remain open by leaning against the threshold of the floor behind.

Panel veneering

The panels can be cut to size at a timberyard equipped with a panel saw or you can use a track saw if you already own one.

Note that in this project very thick veneers have been used, but in the UK most veneer is supplied at about 0.6mm thickness, which requires slightly different working methods but is otherwise just as easy to cut and lay using a knife and safety rule.

Begin by selecting and cutting the various lengths of veneer. If you are unable to find the appropriate size material, simply join two sheets of veneer that are wide enough to cover the large lid surface. If you are working with thicker veneer, you can straighten the edges using a straight strip of plywood held on with double-sided tape and then hand planing the edge with the 'seen' face upwards.

The two main exterior veneers are held together with paper tape and then the bandings are cut to fit around the edges with 45° joins at the corners and held with paper tape. The process is repeated for the veneers on the underside of the lid. Use a contact adhesive that can be brushed on evenly on both surfaces and left to go tacky before laying the veneer in place and rolling or rubbing it down firmly in place and square to the groundwork. The panels must be pressed firmly between two sheets of flat and heavy material and clamped evenly. All the board edges are then veneered, glued and trimmed in the same manner.

5 Edging a board with the same material, using PVA glue **6** Marking and laying the border veneer. Note the perforated veneer tape **7** Taping the whole veneer assembly together

The joints

Once the veneered edges are trimmed the mitre edge joints need to be cut neatly. A tilting head mitre saw is ideal, but you can achieve the same result by making a generous cut with a hand saw and finishing the edges with a hand plane and a bevel shooting board. To hold the joints together firmly two biscuits were used per joint, but the same result can be obtained with wooden pins plus glue, of course. You can use the same method to fix the panel rear although it is a simpler joint.

The bottom of the case is made of an 8mm-thick panel. Although you can pin and glue it in place, this version has a slot machined into the internal faces using a router and straight cutter. This needs to be done before assembling the box.

Before moving on to gluing up the case joints, all the internal surfaces need to be sanded to a finish and then treated with a suitable sealer, such as a water-based matt varnish. Gluing up the case and clamping is easy enough especially as the rear joints are at right angles. It may help to use strap clamps to close the front mitre joints.

Once that is done a frame needs to be biscuit jointed on to the box at both the ends and the rear. This is used to hinge off and the location for the locking dowels.

The upper fixing and hinging the lid

The lid dimensions have been calculated to allow for the stop against the side panels and to the front one for about 5mm. It is designed to be supported only by hinges so choose a sturdy pattern that can withstand being stepped on, like the retractable ones used here.

For their installation, align and place the lid and the rear cross member on the work surface to trace where the locks will be placed. Then a router, guide bush and cutter are used with a jig that sits over the board edge. The jig will have an opening larger than the hinge size to account for the difference between the cutter and guide bush diameters.

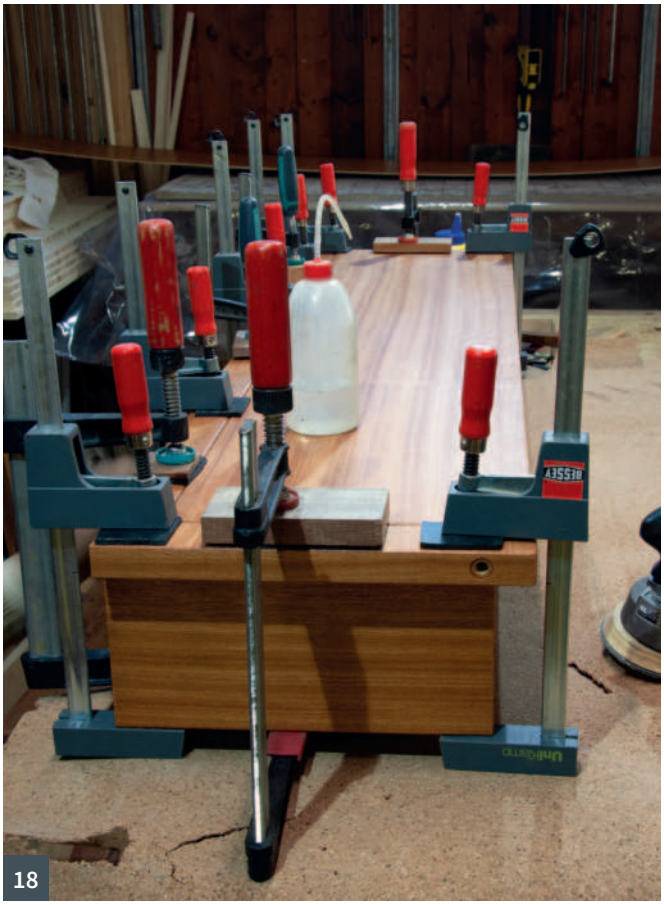
The exterior of the box can now have its finish applied, the same water-based varnish as the interior will do, although you may prefer a satin finish.

8 Cutting the corner joints by hand instead of using a mitre saw **9** The mitre shooting jig used to create precise joints **10** The jig in use using a No.5 jack plane and a good, sharp blade **11** Biscuit jointing the corners close to the inside edge to avoid breakthrough

The cover lock

The lid could be closed with a lock, but this involves removing the key once it is closed so it isn't exposed to accidental kicks. My chosen solution is two lateral wooden pins that lock the step cover to the crossbars. These are turned on the lathe and the heads profiled with a gouge to create a comfortable grip. Since the head ends are slightly fatter, the first part of the hole needs to be drilled at a slightly bigger diameter.

12 Applying a finish to the bottom panel prior to assembly **13** The carcass glued and clamped and then allowed to cure **14** Machining the slots for the recessed hinge mechanism **15** Biscuit slots are needed on three sides for the lid frame



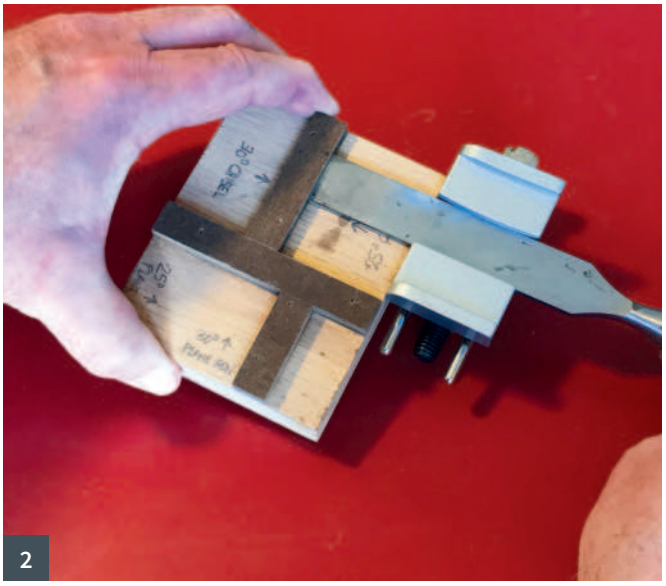
16 The frame in position and working out the locking dowel placement **17** Shaping the knob end of the dowel resting against a stop **18** The frame glued and clamped on to the carcass, note the dowel hole

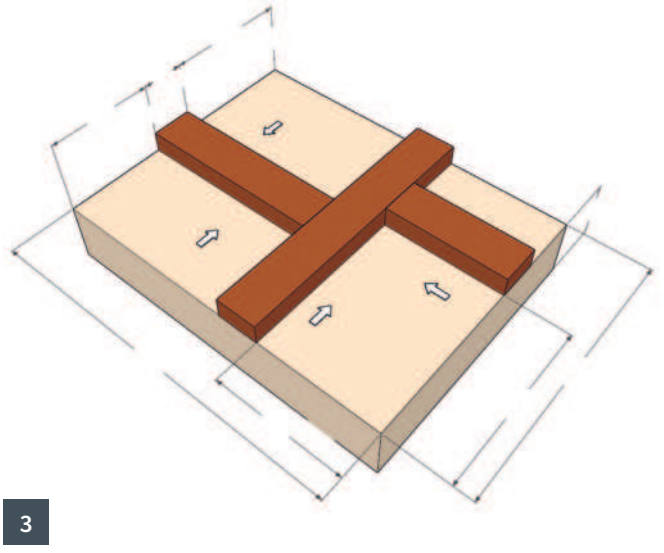
HONING GUIDES

Randall A Maxey shares his expert advice for choosing and using honing guides

Many beginners struggle with how to achieve a consistent bevel angle when sharpening. Even those with years of experience occasionally need to form a clean, accurate bevel on a tool.

Fortunately, there are a variety of accessories available that enable you to set and sharpen a tool like a chisel or hand plane iron with confidence. After you set the proper angle for the bevel, these honing guides hold the blade securely to maintain that angle on a sharpening stone as you sharpen.





PHOTOGRAPHS BY GMC PUBLICATIONS

1 Use the knob on a clamp-style honing guide to clamp the blade in place. The amount the blade projects determines the angle at which the tool rests on the stone **2** This simple jig allows you to quickly clamp a blade in a honing guide to set the proper angle for sharpening **3** You can make a simple guide block for setting the proper angle on a clamp-style honing guide. I used 20mm plywood as the base with 6mm-thick hardboard for the cleats **4** Use a digital angle gauge to quickly set the proper angle for sharpening the bevel on the tool

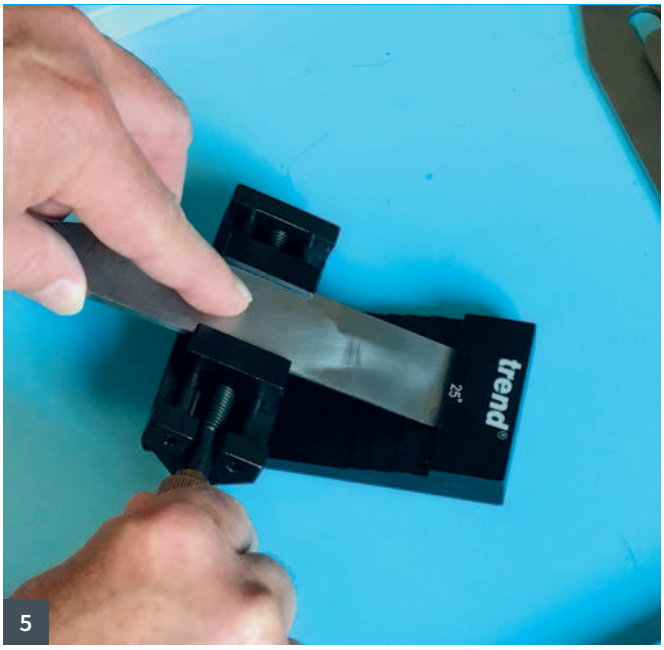
Types of honing guide

The simplest and least expensive honing guide is a clamp-style guide. These are available at most hardware stores. They feature a screw mechanism that, when turned, moves the jaws together to clamp the edge of the tool. The screw knob is usually slotted to provide a way for you to apply additional torque with a screwdriver to ensure the blade doesn't slip during use. This style of honing guide requires that the sides of the blade being clamped are parallel and relatively thin to fit the jaws of the guide. Some chisels are too thick or have tapered sides that prevent a secure grip on the blade.

Setting the proper angle of the tool to dress the bevel is done by adjusting the length of projection from the honing guide. There are a variety of ways to help you set this angle. One is to simply place the bevel of the blade flat on the stone and adjust the position of the honing guide to maintain that angle. You can use a shop-made gauge block to help you set the angle. The one shown here features cleats that help set the correct blade projection from the honing guide.

Another way to set the angle of the blade in the honing guide is to use a digital angle gauge. The digital gauge features strong magnets to attach it to a tool blade or steel worksurface. Set it on your worksurface or sharpening stone and press the 'Zero' button. Then place it on the blade in your honing guide and adjust the projection of the blade until the desired angle is displayed on the gauge.

Some honing guides come with a gauge that helps you set the blade angle with no fuss. One thing to watch for when clamping a blade in a honing guide is that the cutting edge is parallel to the roller and sits square in the guide. If the blade isn't square as you sharpen, you will be removing more material on one side of the bevel than the other, creating an uneven bevel and a skewed cutting edge. It is particularly important to make sure the blade is square on bench chisels and irons for hand planes.



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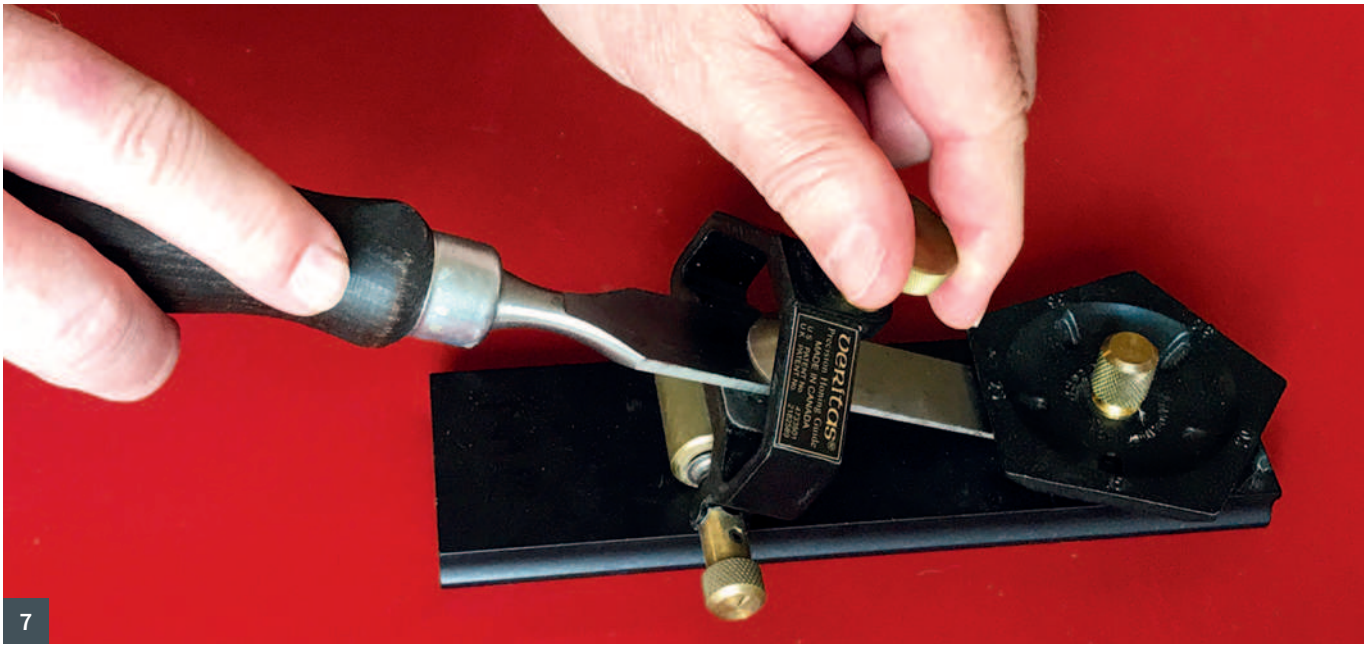

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5 This honing guide comes with a gauge to set the blade angle. The roller of the honing guide fits in a groove in the gauge and the blade is extended to the step on the gauge indicating the desired angle **6** A gauge attaches to this honing guide to allow you to set a range of bevel angles for properly positioning the blade. Once the blade is securely clamped in place in the guide, you remove the gauge **7** The auxiliary angle jig for this honing guide helps to position the blade not only at the proper angle for sharpening the bevel but also ensures the blade is square in the jig

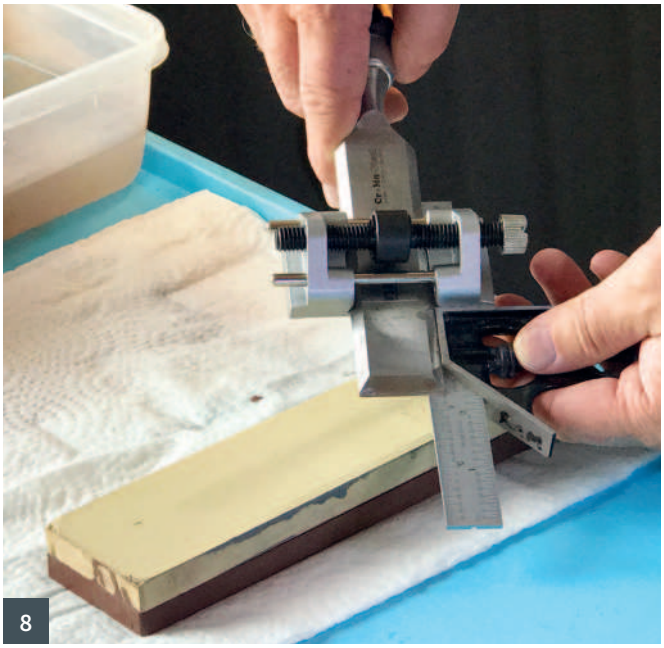
Using a honing guide

For most beginners, it helps to use a honing guide to sharpen the bevel. A honing guide holds the blade at a consistent angle and maintains a square edge. Wheels or rollers help the honing guide move back and forth along the length of the stone or abrasive. Your job is to apply light pressure at the cutting edge to sharpen the edge.

Honing guides vary widely in cost. Some clamp the blade at the sides, and you're left to determine the angle at which the bevel contacts the stone. The amount the blade extends from the honing guide sets the angle. This isn't as hard as it might sound, but it can be a trial-and-error process at first.

With the blade clamped in the honing guide, it is a good idea to make sure the blade is square to the guide. While some chisels, like skew chisels, are designed with angled cutting edges, the cutting edges on bench chisels should be square. Keeping a small square handy near your sharpening station is helpful.

Secure the blade in the honing guide and place the guide on the sharpening stone. Sight under the bevel, then adjust the blade projection until the bevel is resting flat on the stone. Some more advanced honing guides come with jigs and accessories that help set the angle with little fuss.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8 Before honing the bevel, use a small square to make sure the chisel is clamped square in the honing guide **9** This honing guide features an angle registration jig that sets the angle for the bevel **10** This honing guide features an accessory that allows you to quickly set standard bevel angles in the honing guide **11** With the blade clamped in a simple, side-clamping-style honing guide, adjust the position until the bevel sits flat on the stone

SHARPENING: A WOODWORKER'S GUIDE

By Randall A Maxey is available now for £16.99, published by GMC Publications

Box making using the scroll saw

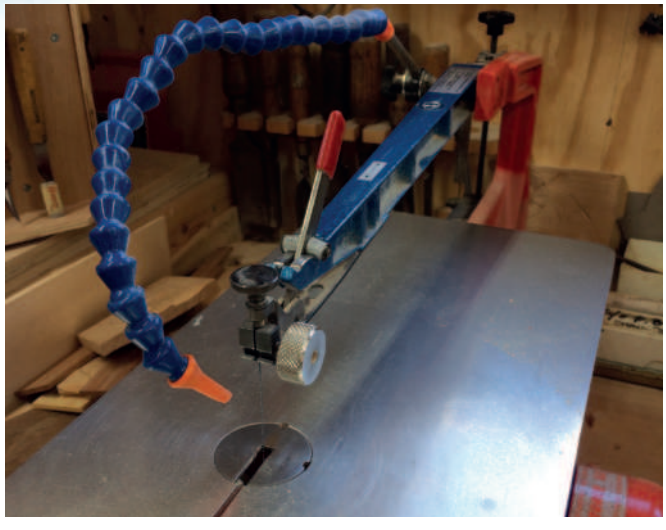
Murray Taylor looks at joint cutting techniques and makes a decorative box

I am primarily a woodcarver and have in the past written several articles on boxes from a carver's perspective as something to decorate. In this article, however, I am going to describe box construction, so let me start by looking at the scroll saw.

The scroll saw

The scroll saw is in effect a mechanical fretsaw that can perform many cutting operations. It is particularly good for cutting small intricate patterns and producing highly complex pierced work, however in this article I am going to use this versatile machine to cut some simple joints that you could use in box construction.

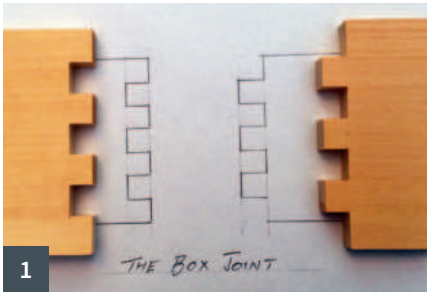
Scroll saws come in all shapes and sizes but more importantly with a vast price range, so remember you only get what you pay for. The less expensive machines usually take a pinned blade similar to a coping saw blade but finer; the pins, however, preclude this type of blade from doing fine piercing work as the pins won't pass through the small drilled holes.



The scroll saw

The box joint

1 The box joint drawn and cut out.
2 The box joint assembled.
3 Cutting the box joint on the scroll saw. Note that I have left a small radius in the corners.
4 Cleaning up the corners. You can approach the corners from two directions, which makes for a much cleaner cut.
5 A simple box made with box joints. The lid is inset with wooden pegs for hinges and two agate slices are set into the lid. Extending the front edge of the lid provides a natural stop and a means of opening the box.



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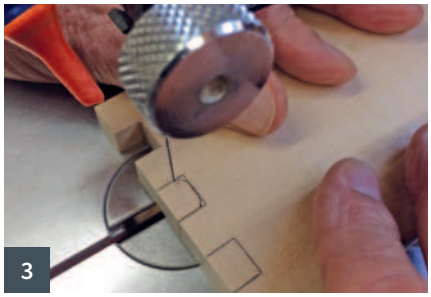
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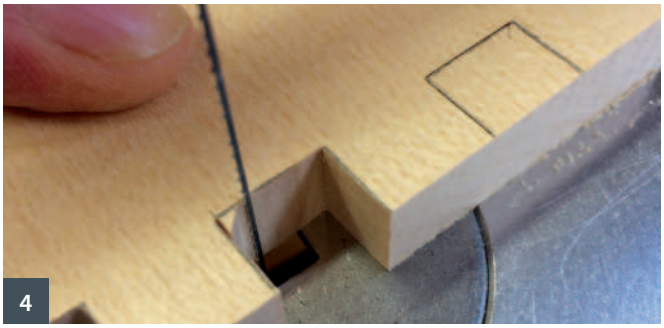
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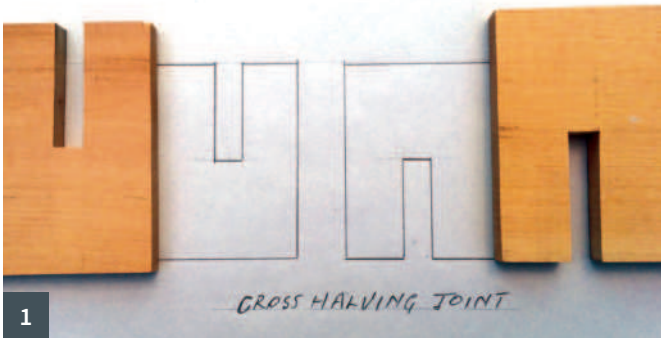
The cross-halving joint

1 The cross-halving joint as a drawing with the cut-out parts.
2 The assembled cross-halving joint.
3 Cutting the cross-halving joint on the scroll saw.
4 A simple 'button box' made with cross-halving joints. The buttons are slices of a branch which have been drilled and varnished and then sewn on to the top with twine. It goes without saying that you would have to drill small holes in the top before attempting to sew the buttons on!



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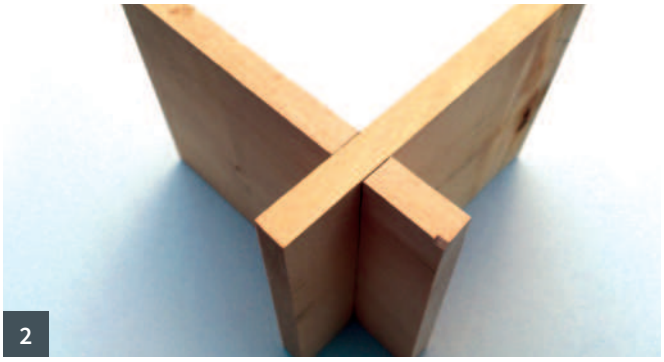
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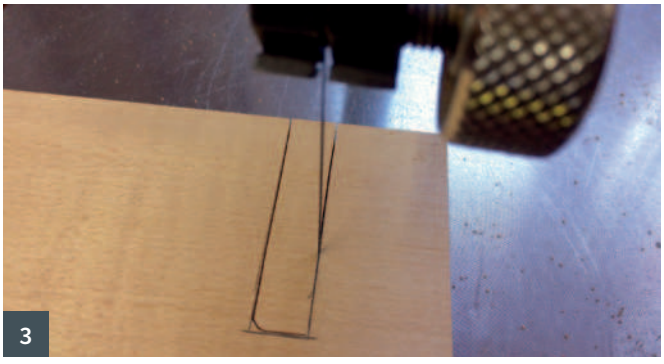
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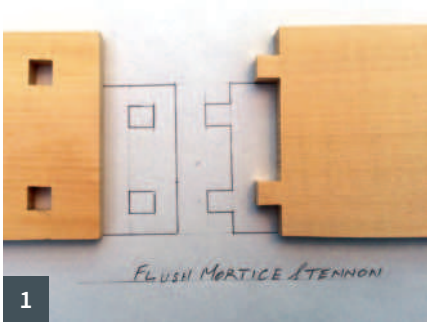
PHOTOGRAPHS BY MURRAY TAYLOR

The flush mortise and tenon

1 The flush mortise and tenon drawn and cut out.
2 Cutting the flush mortise and tenon on the scroll saw.
3 The assembled flush mortise and tenon joint.
4 This is an extended mortise and tenon joint that will be pegged. A small hole is drilled, and the blade passed through and re-clamped. It is now possible to cut the square hole for the peg very accurately.
5 The extended mortise and tenon joint with its pegs.
6 The assembled joint.
7 A box made with pegged mortise and tenons. A haiku poem is represented phonetically on the front panel and translated on the lid.
8 Another variation where the tenons are held with a dowel.
9 Yet another variation, this one is an extended box joint or finger joint, it can be very decorative on East Asian-style boxes.
10 If you don't have a scroll saw you could always use a good old-fashioned fretsaw and bench peg!



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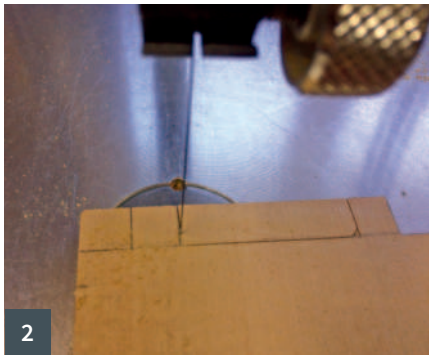
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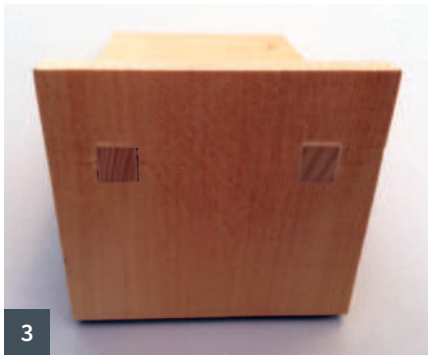
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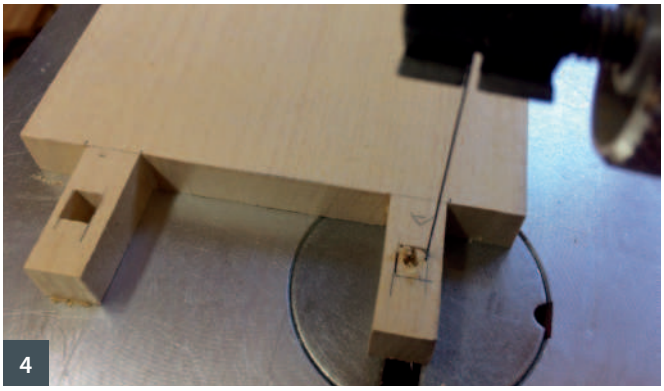
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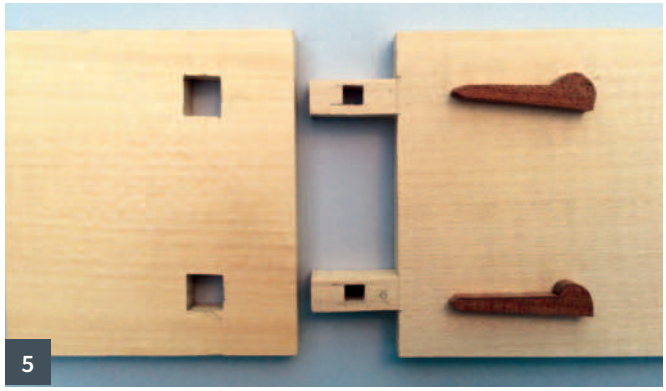
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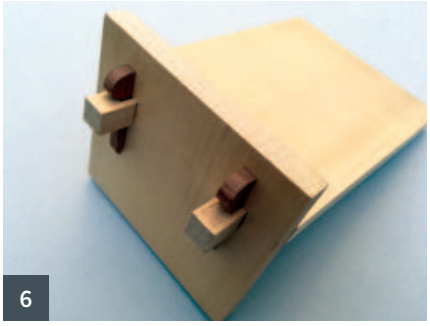
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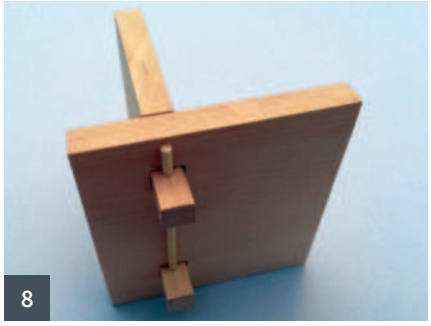
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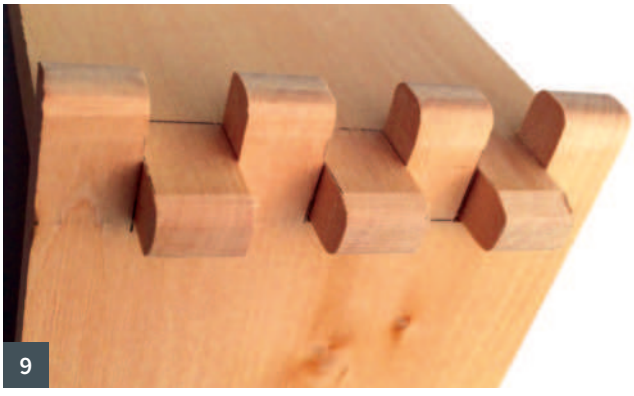
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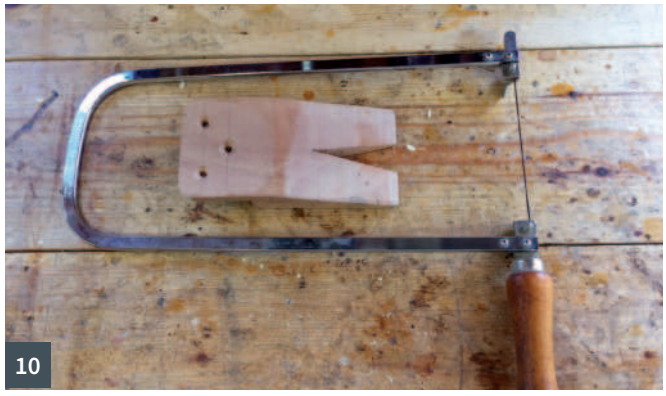
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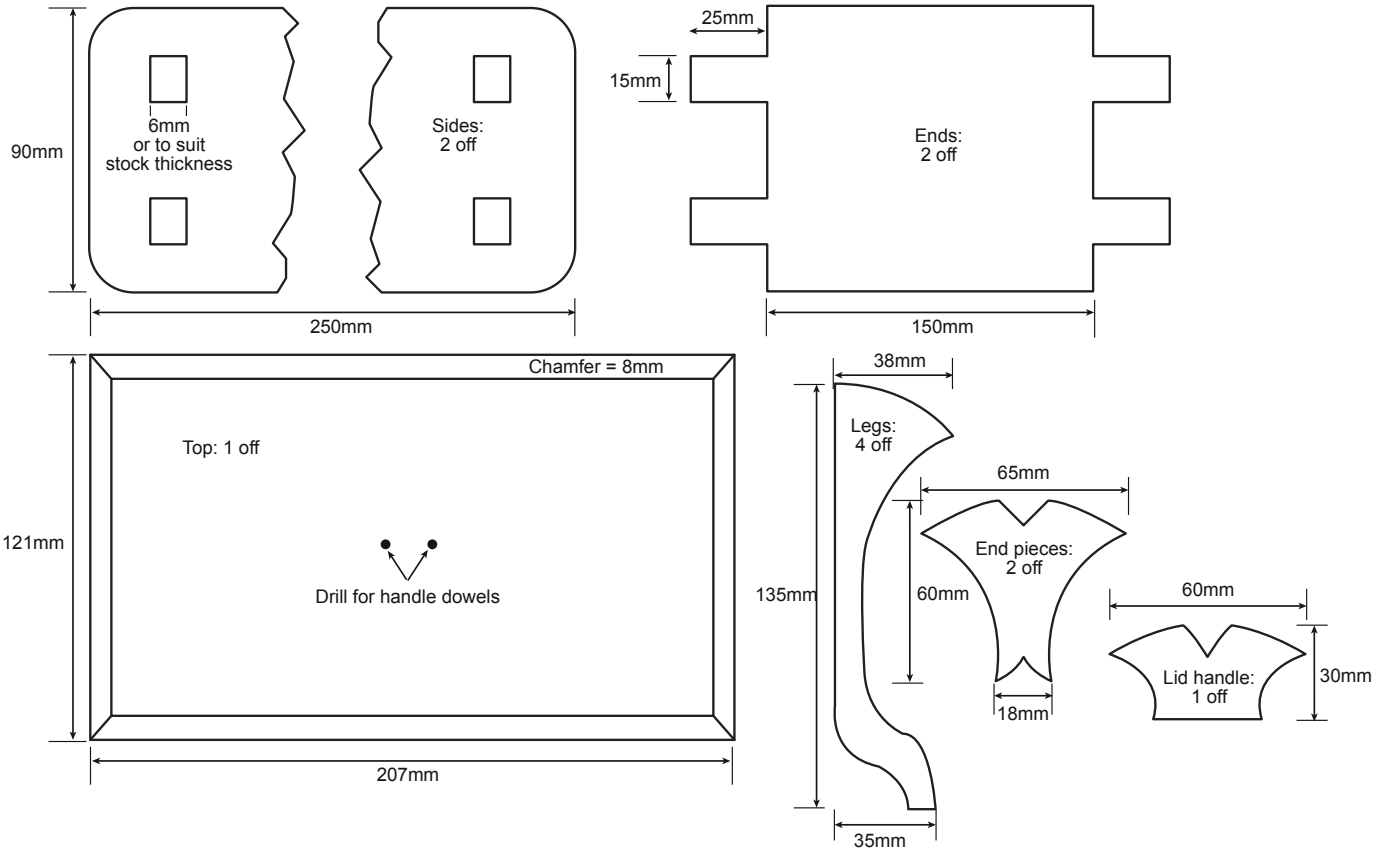
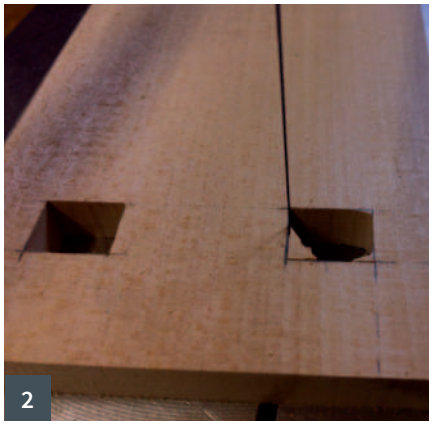
The project

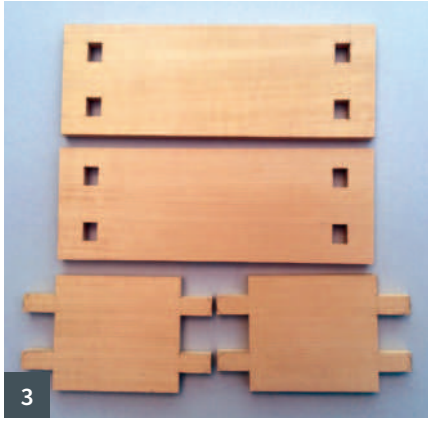
This project is a box in the Japanese style, however the design is not set in stone, or should I say wood in this case, but rather a method of passing on ideas that you can adapt for your own use. You may of course copy my drawing for non-commercial use or adapt it as you will.

Although the box looks a little complicated it is in fact quite easy to construct and the sections can be built up before the whole thing is assembled. The photographs are self-explanatory, but I would suggest lightly pencilled location marks to ensure correct assembly and I found it necessary to number the teak pegs as each one was tapered individually to fit.

As I wrote this article during lockdown I used wood that I had to hand, so as a woodcarver mostly working in lime, this is the stock I had most of and have used for the main construction of the sides, ends, top and base of the box. The legs, end pieces and handle are sapele and the pegs are from some 6mm teak dowel I had in store. You can use any timber that you have but try to get a good colour contrast.







1 The sides and end pieces marked out for cutting.

2 Cutting the mortises on the scroll saw. Note the corners left for accurate trimming.

3 The sides and ends cut out.

Sadly Murray Taylor passed away shortly after writing this article. The team at GMC Publications would like to offer our condolences to Murray's family and friends.

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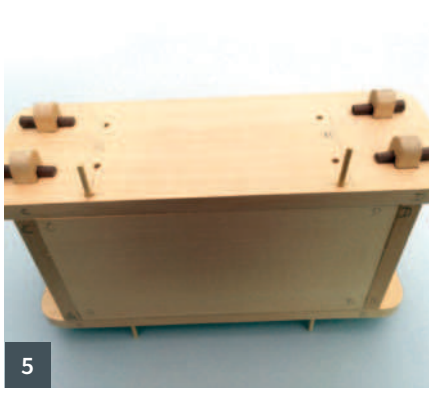

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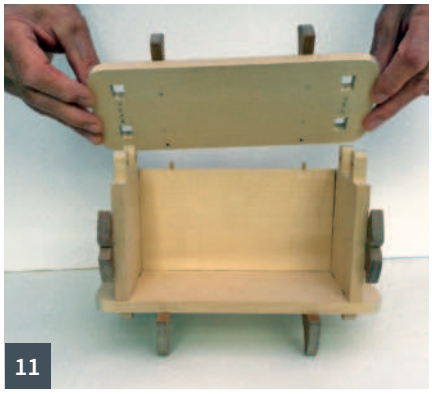

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4 The basic box construction.
5 A further stage in the construction. The teak pegs are fitted, note that each one is tapered on the underside. The bottom of the box is planed off to a tight fit and then drilled to take the dowels that will eventually hold it. When these dowels are cut flush, they will be hidden by the legs.
6 The legs are fixed to the sides and the dowels are trimmed off.
7 A trial assembly of the box parts.
8 Trimming the dowels on the end pieces.
9 Planning off the dowels on the front of the end pieces.
10 Forming the chamfer on the lid.
11 When the side panel goes on the dowels in the base enter the pre-drilled holes and the base is secured.
12 Finish with a very light sanding. I have used a coat of transparent white polish.

NIGHTINGALE FLOORS

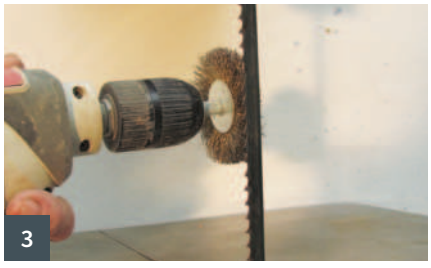
The idea of suspending the bottom of the box in this way comes from a construction method used in old Japanese castles. The floors were constructed in such a way as to make a sound like bird song when an intruder walked on them in the night and are called nightingale floors in English. You can look this up on the web and even listen to the sound they make!

Conclusion

I realise that this project veers away from traditional joinery methods, but it is good to think outside the box sometimes (excuse the pun). The scroll saw is not the usual tool for making joints, but I find it invaluable in the workshop and hope that I have inspired you to try some of these ideas. Very much in line with Japanese techniques, you will note that there are no nails, screws or other metal fittings, in fact I will now reveal that the dowels holding the various parts of the box other than the eight teak pegs were made of bamboo meat skewers!

MAINTAINING YOUR BANDSAW BLADE

PHOTOGRAPH BY GMC PUBLICATIONS/ANTHONY BAILEY



PHOTOGRAPHS BY CARL DAVIS, UNLESS OTHERWISE STATED

Tony Davis explores the problems surrounding bandsaw use and shows you how to get the best from this piece of kit

When using the bandsaw, I sometimes encounter problems. These problems involve issues such as the blade binding, or the cut bowing when making deep cuts.

If you too have bandsaw problems, it is worth seeing why the blade – which is the key component of the bandsaw – may be causing them. For example, is the blade blunt, or at least less sharp than it was? Or, is there a build-up of sap on the blade? Admittedly, this issue can be more pronounced when using certain types of timber.

HERE ARE SOME OTHER POINTS TO CONSIDER:

- When resetting the teeth, remember to do them alternately, right and left.
- Start with a light set and see if this is adequate.
- If you do reset the teeth, make sure that your guides are correctly set, especially if they are the ceramic type.

Blade maintenance

1 It's important to regularly maintain your saw blade and ensure that you set the tension and guides correctly. A blunt blade can be re-sharpened with a chainsaw file or a rotary carver with an appropriate metal grinding burr fitted. This job requires patience, but you will find that it is quite easy to do.

2 A problem with some saw blades is that they have a very small amount of set on the teeth (teeth spread). This means that there is very little clearance for the blade in the cut – even for a new blade – and the problem is worse when sap builds up on the blade, or when sawdust builds up when cutting wet wood which can lead to 'binding in the cut'. This problem of 'light set' can be remedied with a pair of sawtooth set pliers. Blades can be quite brittle, so don't try to increase the set too much or you may break the teeth. You will be amazed how only a little extra clearance can make your blade last longer, and be safer with no heat or binding.

3 My saw has a 112in blade. Since I do not require a fine cut, I always buy a 12mm (three or four teeth per inch) blade. As soon as the blade starts binding, I carefully brush both sides with a wire brush and then sharpen all the teeth with a chainsaw file.

4 Once you have sharpened and reset the teeth you will find that the extra clearance enables you to easily back off your cut, and turn much tighter curves. With this new, more versatile cut, you can allow your imagination to create shapes straight off your bandsaw.

SLOW CRAFTSMANSHIP

Carver, turner and furniture maker Bobby Mills takes time to craft uniquely beautiful, slowly made furniture, vessels and sculptures

Making beautiful pieces of furniture, carving and turning takes time, and Bobby Mills is prepared to take that time. 'I work slowly, and not from plans – I react and respond to the wood,' he says. 'I'll have a piece of wood that I think will make a great bench, and I begin working it. It's only me, so I have to be careful and thoughtful when it comes to moving large pieces. I resort to hand tools as much as possible, many coming from Windsor chair making.

'There is a connection you feel with a hand tool that I like: they are often handmade themselves, and you can really feel the wood in your hands through the tool. Your hands direct your thought process as you respond to the grain structures and patterns.'

Coping with lockdown

Although, as for so many others, the Covid-19 crisis and lockdown caused Bobby anxiety and impacted on his business, he says the extra time it gave him was positive. 'I'm keen to work through this challenge as best I can,' he says. 'I'm fortunate that I work alone in a rural setting, so I can work on personal pieces if commissions slow down. I'm mostly trying to focus on the positives, as it's given me time to reflect and be thankful, which is harder with the fast pace of normal life. I'm very fortunate to have the support of my clients, who have helped me get through, so I'll remain optimistic for the future.'

Form and function

Stools and vessels form the core of Bobby's collection. 'For me a three-legged stool is the perfect example of form and function,' he explains. 'They are like sculptures, beautiful objects, and so useful. A three-legged stool will be level and sturdy wherever it sits, and is incredibly robust. I find there is endless scope to play with the form of the top to create something that blurs the lines between art and craft.'

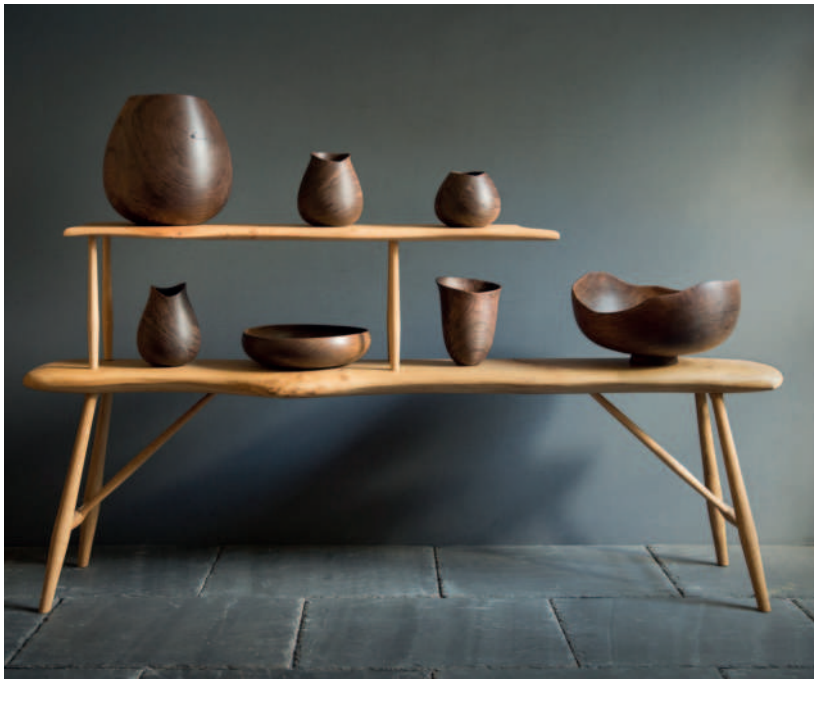
He adds: 'Vessels allow me to really explore a piece of wood. Each pass with the gouge reveals another layer of grain and character. A vessel allows for a piece of wood to be preserved in a sculptural state for centuries to come and stands with a natural presence like a tree.

Bobby takes inspiration from his English father and his mother's Danish family, his surroundings where he grew up in Sussex and his new home in Devon. 'My work reflects my English and Danish heritage for its raw, stripped-back aesthetic, while maintaining a refined design. Using my traditional English techniques and materials, I look to strike the balance between form and function. I grew up surrounded by many Danish pieces passed down through my mother's family, and always loved the simple, functional designs.'

He goes on: 'My inspiration comes from a few places. Firstly the trees, with their centuries of growth and the landscapes they stand in. Then there is the feeling of making. We are programmed to make things, and I find the act of making very inspiring in itself.

'I recently relocated to North Devon to set up my own workshop and the area heavily impacts my work on several levels. Firstly, it's a wonderful place to be – we are 650ft above sea level and have the Atlantic ocean just to the west. We are the first hills the storms and winds hit, having travelled across the ocean creating a climate perfect for thriving life. The deep valleys are thick with ferns, moss and lichens, old oaks and water meadows. There are dramatic cliffs and long sandy beaches and the surf is great all year round. Outside my workshop time I spend a lot of time running in the hills or surfing, which helps maintain a good state of mind.

'It also heavily influences the materials I use. I source a lot of my wood for my turning from temperate rainforest woodland a short walk



from my workshop. It's a wonderful place – damp, steamy and thick with moss and lichens. It's ancient woodland.

'Sussex country is still very special to me and I return on a regular basis for my materials. I have a particular soft spot for Sussex oak and enjoy working its nuanced character into furniture pieces.'

Solid foundations

Bobby learned his craft by helping his father fix and maintain old buildings near their Sussex home using traditional techniques and hand tools. 'This gave me a good foundation in understanding tools and materials,' he says. 'I haven't received any formal woodworking training, but draw on this practical foundation. I spent a week with a fantastic local chairmaker in Sussex, James Mursell. I built a rocking chair with him, and he passed on so much knowledge, which I'm very grateful for.'

Bobby's first project was a beehive stand for the farm where he was renting a cottage at the time in Sussex. 'The farmer told me of a stash of oak he had in a barn. He said it was an almighty tree that had stood close by, and was locally known as honey oak for its mellow brown colour. I made him two beehive stands with the wood and continue to use the wood to this day as I slowly expand my Tuckmans Collection.' The collection includes a number of three-legged stools, all made from the wood of that one oak tree, which stood for more than 350 years.

It was a chance meeting that gave Bobby the confidence to set up his own workshop, allowing himself the space and freedom to make the work he had dreamed up into a reality.

'By chance I met two woodworkers in Thetford – Harriet, who was 93 years old, and her apprentice Tilly. Their workshop was a series of ramshackle, tin-roofed sheds: breezy, full of character and with a wood burner for the winter. I realised that I didn't need a fancy unit or a big space full of machines, so I set out and created my own little space filled with just the tools I needed to create the work I wanted to. It was an achievable way for me to get going.'

He has been in his first workshop for 15 months. 'It's small, but big enough for now,' he says. 'I'm taking on bigger projects with bigger pieces of wood, so I think in time I will find a larger space. But for now it's just right and I make it work. It has old stone walls and a wooden floor, a hawthorn tree hangs over the roof with birdsong humming all day. There's a small woodburner that my kind neighbour gave me to keep the damp and chill out of the air, and a mouse lives in one of the walls, much to the dismay of my cat. I have a tool wall with most of my tools accessible just by turning around, my lathe and old noisy pillar drill in the corner.'

Guided by hand

Hand tools are key to his work. 'I'll shape with a farrier rasp and drawknife to remove a lot of material, a travisher is handy, as are spokeshaves and cabinet scrapers. My lathe is a crucial tool for me. I turn spindles with it, make dowels, legs and stretchers and turn all of my vessels and bowls with it. Although it simply turns a piece of wood, I find it's such a versatile tool and suits my wider techniques and methods. All of my mortising and drilling is done by eye. Instead of making jigs upon jigs to set and measure angles perfectly, I opted to work by eye and respond to each action I make.'

The wood itself directs Bobby's design process, which he describes as 'very responsive'. 'I always react to the wood and the pieces come directly from the wood. I'll intuitively shape a bench or table, working with the grain patterns while being guided by my hands. Importantly I'll work on one piece at a time from start to finish. This might sound like the opposite of efficient, but for me it means I can give all of my energy to that piece. It also makes each piece an individual object, with every component consciously made for it. No set of legs is the same, stretchers are made referencing the overall design to get the right form and aesthetic weight, and I can change things as and when I see fit throughout the process.'

He works in much the same way when he has been commissioned, with clients, including a gallery he works with, trusting him to fulfil their wishes without digressing from his own signature style. 'I don't work from plans, so I rely on trust from my clients, but I do make the odd sketch here and there,' he says. 'It can be helpful for both the client and me, while still keeping the design and final piece somewhat open. I think my work has a fairly clear style and I find that the clients it attracts are happy to invest in my open, responsive approach. With this every single piece I make is a one-off and can't be repeated, a bit like each piece of wood is totally individual.'

Bobby uses a range of woods including oak, walnut and lime, and always turns while the wood is still high in moisture. 'As each piece dries it then settles into wonderful natural forms,' he explains. 'For my furniture work I mainly work with oak, English or Scottish. I have a

great love for its warmth and layered character. It's very strong, and if used with continuous grain in the right areas can be really refined into elegant designs. I've lately had the pleasure of working with 40-year-old English walnut, which has been fantastic. It's lovely to work with hand tools, and the wood itself is truly magnificent. Every type of wood has its own working character. I enjoy turning burr oak and using it for furniture pieces, but it's incredibly tough, especially kiln-dried burr for furniture. The endless knots and pips take their toll on the tools, but taking the time to keep them sharp really helps.'

He prefers to use a natural finish. 'I use hard wax oil on all of my furniture, but with barely any shine. Wood isn't shiny by nature, so I use a finish that is sympatric to the natural aesthetic of wood. For me, I want a finish that lifts the wood without changing it.'

The most enthralling – and most challenging – project he has worked on so far is a bench he made with a piece of 400-year-old English walnut. 'To find this wood was incredible, to see it, to study its grain, to think about the size and beauty of the tree from which it came. It was a pleasure to work, and the size of it allowed me to find a design that I was very happy with. I complemented the dark walnut tones with the warm golden tones of English oak for the undercarriage and spindles. I couldn't have been happier with the final piece.

'While it was the most rewarding, the walnut bench was also the most challenging. Its scale was difficult to manage on my own for one thing, but the responsibility of celebrating this piece of wood was on my mind. It cost a huge amount in itself and I had to be very aware that every move I made was removing wood, and I would have to stop working it at just the right time.'

His current projects include a collection of English walnut vessels with an accompanying oak shelf display piece for the seven forms to sit on. 'Then I'm moving on to a burr oak coffee table, and I look forward to turning some big pieces of lime I've just received from the rainforest woodland down the road. I'm always looking to get the balance between commissioned work and personal pieces,' he says.

Looking to the future, he is working off-plan, just as he does in his workshop. 'I'm following my nose and developing as a woodworker, and designs are evolving as part of the process. I'm interested in creating larger bodies of work in future to see how furniture pieces and vessels might begin to come together in a single space,' he says.

bobby-handcrafted.com

GOOD WITH WOOD:

A new series from Channel 4 will showcase the skills of UK woodworkers

PHOTOGRAPH BY MARCO VITTUR

Our favourite craft is coming to the small screen later this year as the UK's most talented woodworkers are to be put to the test in a new, six-part series from Plimsoll Productions and Channel 4.

Presented by Mel Giedroyc, *Good With Wood* will see a group of woodworkers challenged to craft beautiful and ambitious builds to exacting briefs. Over a series of competitive rounds taking place in a stunning woodland setting, they will have their skills tested to the limits.

Each episode will centre around a 'Big Build' in which the contestants will create large and imaginative wooden structures and objects, as expert judges scrutinise their designs, techniques and skills. The competitors will be pushed to their limits, with only one crowned as winner.

Mel Giedroyc said: 'In the words of Ian Faith, the manager of Spinal Tap, "... in the topsy-turvy world of heavy rock, having a good solid piece of wood in your hand is often useful." I would add to that by saying that in the topsy-turvy world of 2020 IN GENERAL, having a good solid piece of wood in your hand is pretty much ESSENTIAL. So, if you go down to the woods today, you're in for a big surprise. *Good With Wood* is going to be something we can all lean on. I can't wait to make like Edward Woodward and get WOODSWARD.'

'In a throwaway world, more and more people are turning to woodwork to connect them to nature and their creativity.'

Karen Plumb, head of factual entertainment at Plimsoll Productions, said: 'In a throwaway world, more and more people are turning to woodwork to connect them to nature and their creativity. We're delighted to be making this escapist and ambitious competition for Channel 4.'

Daniel Fromm, commissioning editor at Channel 4 Popular Factual, said: 'Joyous, insightful and entertaining, this series is feel-good factual entertainment and an antidote to our times, as it celebrates the extraordinary craftsmanship and artistry of the country's finest woodworkers.'

To learn more about the series, and maybe even take part yourself, check @goodwithwoodtv on Instagram and Twitter.

PERFECT CIRCLE CUTTING

Charles Mak shares two ingenious circle-cutting techniques for furniture making

The router – used with a trammel – is what most furniture makers will employ to cut larger circles such as for a tabletop or for a drum. Next in line for popularity are the jigsaw and bandsaw, but neither offers the kind of clean edge that the router does. I have used different ways to cut circles, and by far, I make them mostly either on the tablesaw or on the router table. Although least known, the table methods are precise, fast and free of visible centre holes as well as free of any cord tangling. These advantages alone should convince you to look into their methods a little further. Once you have tried them out, perhaps you will think twice before going back to your old ways of cutting circles. Let me start with the tablesaw method, which I used to make the top for the nook table shown above.

Cutting circles on the tablesaw

The tablesaw technique uses a sliding jig that creates a circle not in a single step, but in a series of cuts to progressively turn the workpiece into a circle. The jig consists of three components: a base, a mitre slot runner and a pin. In design, the sliding jig is similar to a panel-cutting jig – except without a fence.

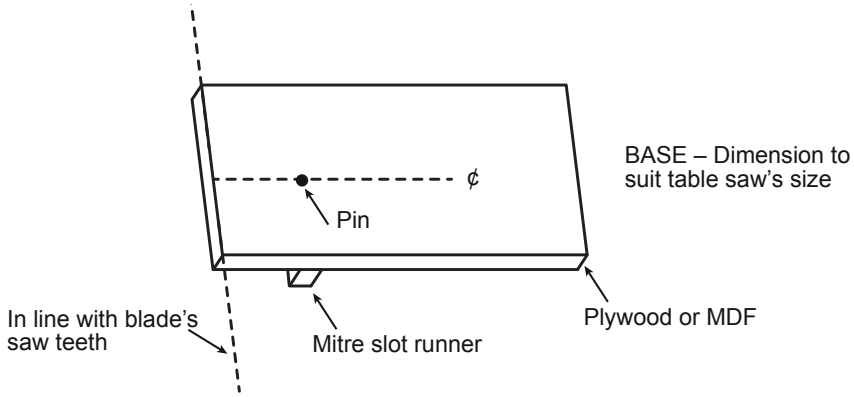
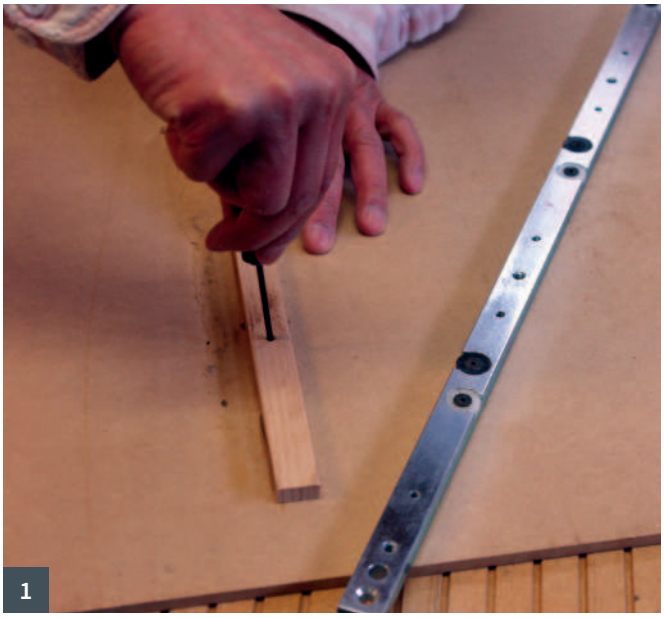


Diagram 1 – table saw circle jig
(NOT TO SCALE)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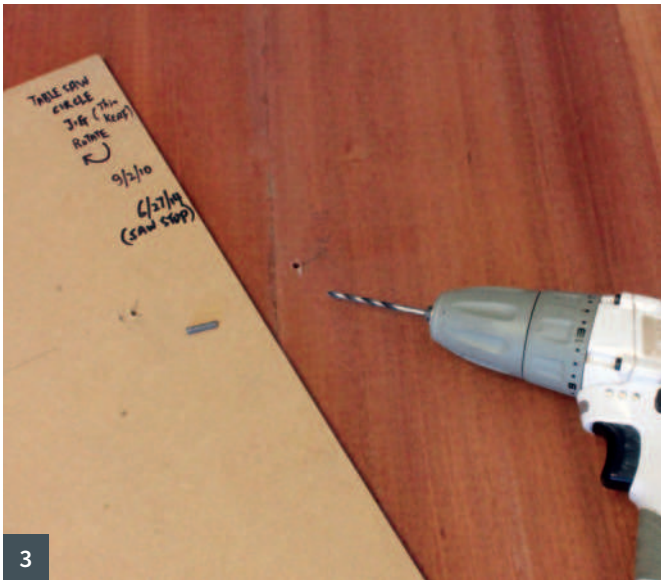

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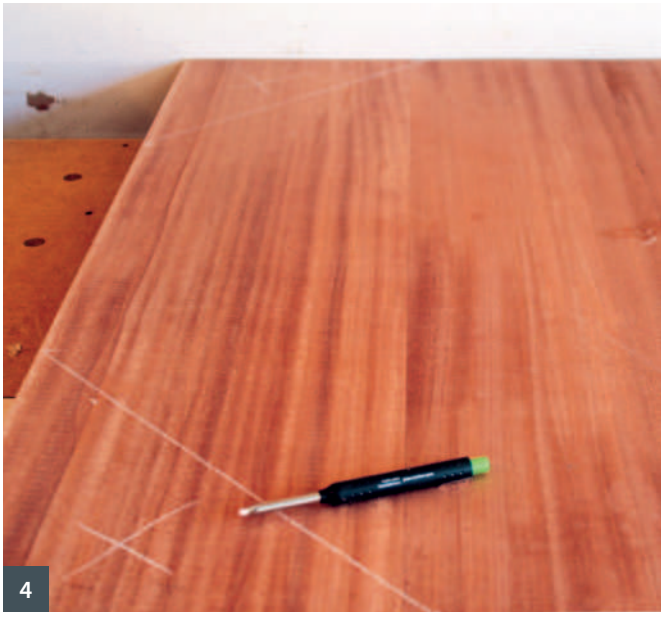
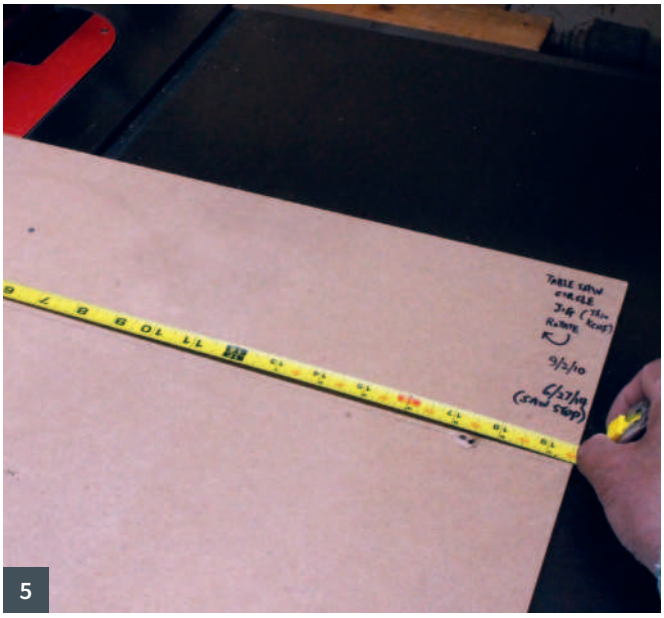
1 Attach a runner to the base to make the jig **2** Start with an oversize square piece **3** Drill a centre blind hole

TO MAKE THE SLIDING JIG, FOLLOW THESE BASIC STEPS:

1. Cut a 12mm-thick or thicker piece of plywood to make a base to suit your tablesaw's size
2. Attach a hardwood or commercial runner to the base with an overhang past the blade (photo 1).
3. Place the jig in the mitre slot on the right side of the blade, and cut the overhang to zero out the jig.
4. Draw a centre line across the jig.





PHOTOGRAPHS BY CHARLES MAK

4 Precut the waste **5** Measure the radius and place the pin **6** Cut the first corner **7** Rotate the work clockwise

THE PROCEDURE TO CUT A CIRCLE WITH THE SLIDING JIG IS AS FOLLOWS:

1 Start with a square workpiece slightly larger than the desired circle (photo 2).
2 Drill a centre blind hole on the underside of the work for the pin (photo 3).
3 Precut some of the waste with a jigsaw if the panel is large and thick (photo 4).
4 Measure the desired radius from the edge of the jig, and install or move the pin accordingly (photo 5).
5 Place the work over the jig, and cut the first corner off by sliding the jig past the spinning blade (photo 6).
6 Slide the jig back, rotate the work and cut the second corner by sliding the jig forward.
7 Keep repeating steps 5 and 6 to cut off more corners to form, first an octagon, then a hexadecagon and so on until it is almost round.
8 In the last step, position the jig with its centre line slightly past the front of the blade, and rotate the work clockwise against the spinning blade to complete the circle (photo 7).

Cutting circles on the router table

This method also works with a jig in a sliding fashion. The router sliding jig is composed of a base, two cleats and a pin. Unlike the tablesaw method, the router technique can make circles of different sizes without repositioning the pivot pin.

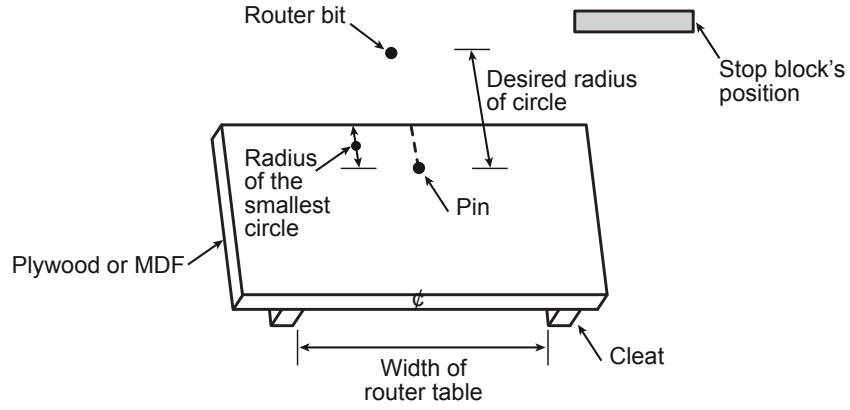


Diagram 2 – router table circle jig
(NOT TO SCALE)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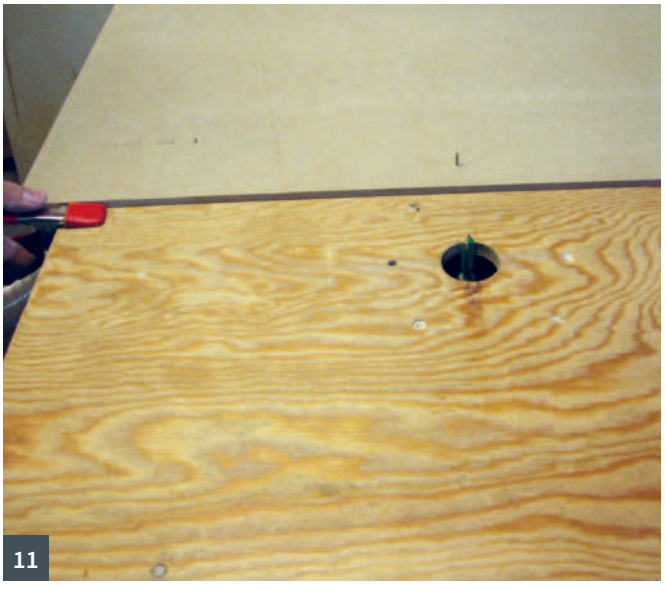
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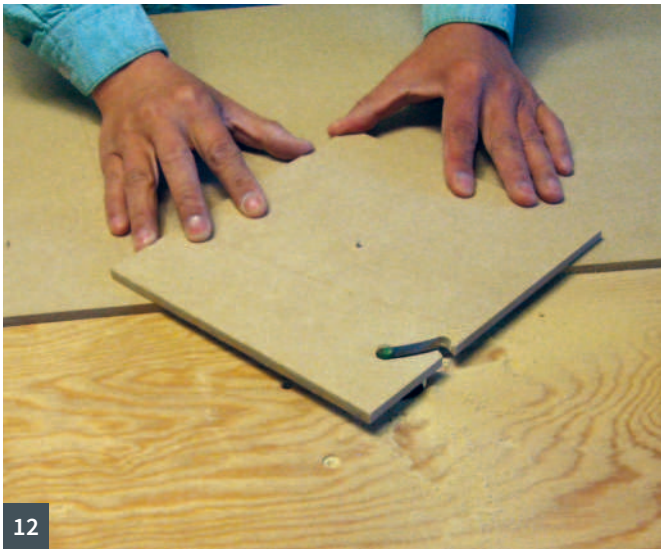
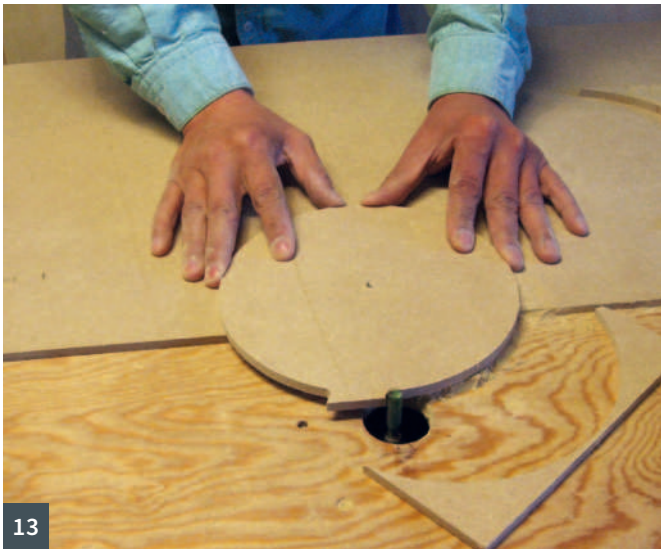
8 Attach a cleat on each side of the jig **9** Place the pin to mark the radius of the smallest circle you will make **10** Set the pin and jig at the desired radius **11** Use a stop block to control the jig





12 Slide the blank and jig into the spinning bit **13** Rotate the work anticlockwise **14** Re-position the jig and reset the stop block to make a different-size circle … **15** … then follow the same procedure as before

HERE IS HOW TO MAKE THE ROUTER JIG:

1. Cut a 12mm-thick or thicker plywood a little wider than your router table and extending slightly past the centre of the table.
2. Glue and screw a cleat on each side of the jig so the jig glides along the table without any play (photo 8).
3. Draw a centre line on the jig, and install a pin from its edge at a distance that stands for the radius of the smallest circle you plan to make with the sliding jig (photo 9).

TO USE THE JIG, FOLLOW THESE STEPS TO CUT CIRCLES:

1. Start with a slightly oversized square blank.
2. Position the jig with the pin set at the desired radius from the bit (photo 10).
3. Clamp a stop block on the table to limit the travel of the jig (photo 11).
4. Drill a centre blind hole on the bottom of the blank, and place the blank over the pin.
5. Slide the blank and jig slowly into the spinning bit until the jig hits the stop block (photo 12).
6. Rotate the work anticlockwise in a slow and steady fashion to finish the circle (photo 13).

Tip: When routing thick stock, complete steps 5 and 6 in multiple passes to avoid burn marks.

If you need to make a second circle of another size, instead of repositioning the pivot pin, simply re-position the jig itself to the desired radius, and reset the stop block as well (photo 14). Then follow the previous procedure to rout the new circle (photo 15).

Whether you need a big, heavy top for a round table or a small circular platform as a spray booth turntable, one of these table-based techniques will guarantee you a perfect result – without you running around in circles!

Fitting cabinet hinges by hand

Matt Long and Anthony Bailey open the door to a satisfying hand tool technique

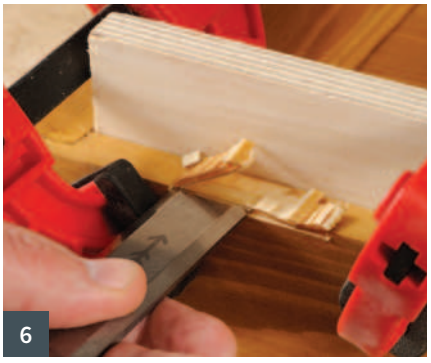
To demonstrate this technique we will fit a small brass cabinet hinge into the hinged lid of a jewellery box. The hinge has been recessed, double depth, into the box so it sits on the lid surface. We'll show you how to cut the hinge for a standard lid, recessed into both sides, and you can adapt this technique to suit your own projects.

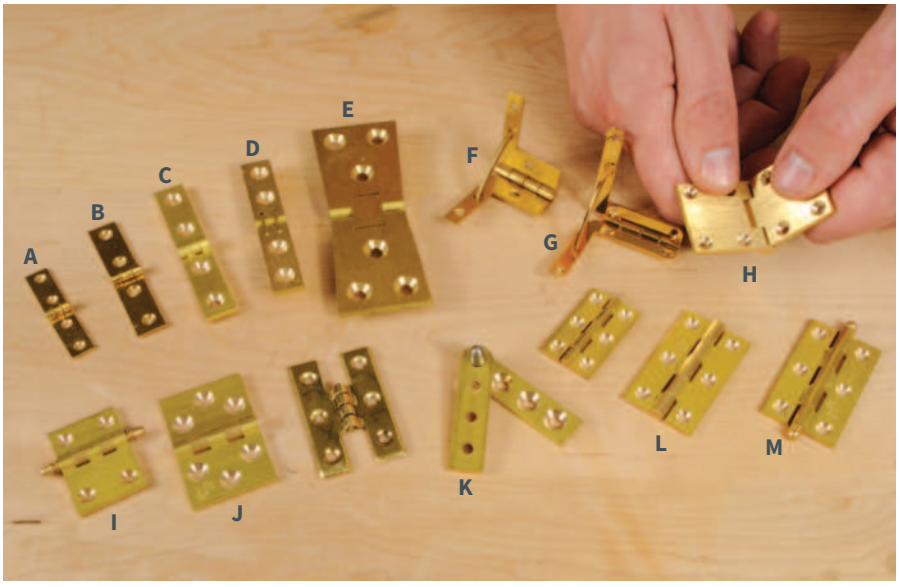
FITTING THE HINGE

1. Ensure the lid fits the intended box correctly. Mark the leaf position on the lid and box with a single knife mark, then use a square and knife to mark either side of the leaf to its full width.
2. Use a marking gauge to mark the width and depth of the hinge leaf on both lid and box. For a standard hinge, set the gauge from the midpoint of the hinge knuckle. Other hinge types may require different settings. Reset the marking gauge to the thickest part of the hinge leaf to mark the recess depth.
3. Use a very sharp bevel-edge chisel and a mallet to indent the two original cross grain knife lines so they cut the wood fibres properly.
4. Pare down towards these cut lines from the waste side at an angle. The recess is now marked out and the waste to be cut out for the recess is marked cleanly, ready for removal.
5. Holding the chisel at an angle and starting slightly in from one end with the bevel down, chop downwards and at a slight angle to break up the waste wood fibres. Repeat along the recess.
6. The thin strip of good timber that needs to remain will tend to split out when chiselling out – clamp a piece of board against the inner face to prevent this. Pare the base of the recess roughly level.
7. Hold the chisel vertically and lightly chop a clean straight line along the back of the recess. Note how the thin strip of wood behind the chisel is kept intact by the board. Steps 5, 6 and 7 are repeated as you work your way down to the full depth for the recess, going by the feel of the timber.
8. Now push the leaf into the recess and check for fit. If it's good, hold the hinge in tightly and use a bradawl to mark the exact centre of the screw holes. Drill a pilot hole, then fit the screws, tightening up carefully. As a stylish finish, line up all the screw heads, as in the opening photograph. Next, close the lid. If you have chopped your recesses too deeply, the lid will bind on the side – in this case use veneer packers to raise the hinge up.

TYPES OF CABINET HINGES

There is a plentiful, and somewhat confusing, selection of cabinet hinges on the market. Opposite is a selection of commonly available types. Each of these hinges will have different recess cutting requirements and need a lot of care!





A, **B**, **C** – writing slope strap hinges; **D** – card table hinge; **E** – counter flap hinge; **F**, **G** – quadrant box hinges; **H** – sprung butler's tray hinge; **I** – clock case hinge; **J** – backflap hinge, 'H' hinge; **K** – pivot hinge; **L**, **M** – narrow butt hinges, ball hinges (also available with spire or button caps).

PHOTOGRAPHS BY GMC PUBLICATIONS/ANTHONY BAILEY

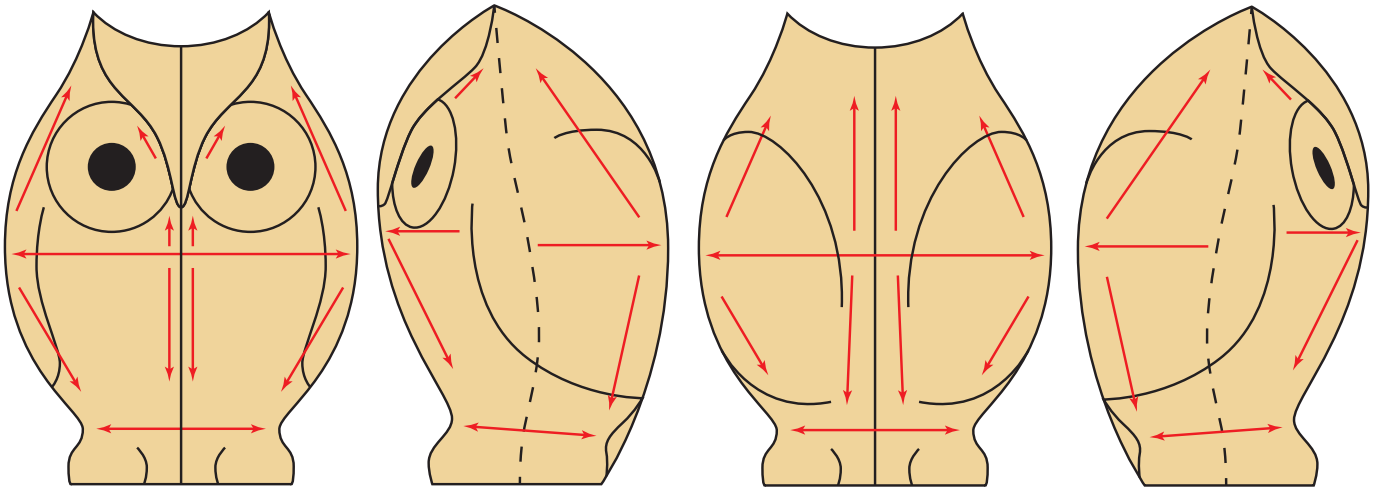
Stylised owl

You'll only need two gouges to carve this elegant project by Andrew Thomas

This simple little project of a stylised owl is a gentle introduction to the art of woodcarving aimed at the beginner, with minimum outlay on tools as it only requires the use of two gouges. It is also a very good initial exercise in gaining practical experience of how to approach the different grain directions – as marked with the red arrows. The scale designs supplied can easily be altered or adapted to incorporate your own ideas if you wish to, which is very much encouraged.

The wood used in the example is a piece of American black walnut, which is a pleasure to carve but quite hard in density and much less forgiving when carved close to the grain direction. If you would prefer a softer and easier species to work with then lime is a good choice as it is quite soft and very forgiving when carved close to the grain. Walnut is, however, far more aesthetically pleasing when finished compared to the rather bland colour and figuring of the lime and is also better suited for this subject.

Before you start working on the owl read through the complete step guide and study the stages and finished images to see how the form develops. This will help you to familiarise yourself with the finished form that you will be trying to produce. It is very important to ensure that the grain of your block is running vertically through the design.



YOU WILL NEED

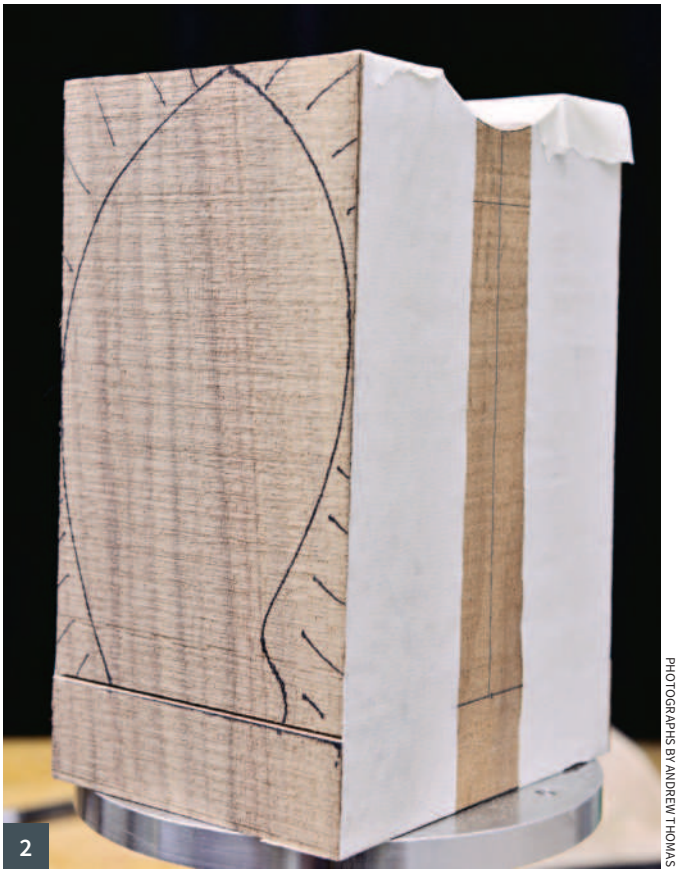
Swiss gouges:

- No.2/20
- No.9/10

Wood:

American black walnut

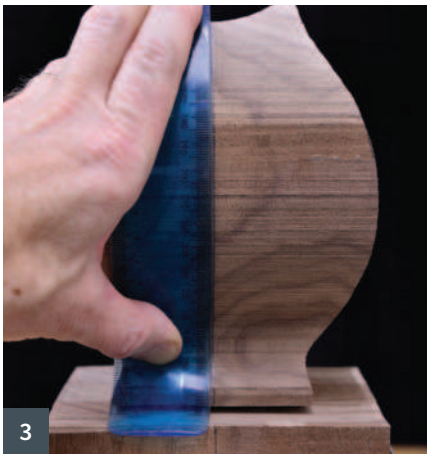
Dimensions of article example: H 160 x W 120 x D 100mm

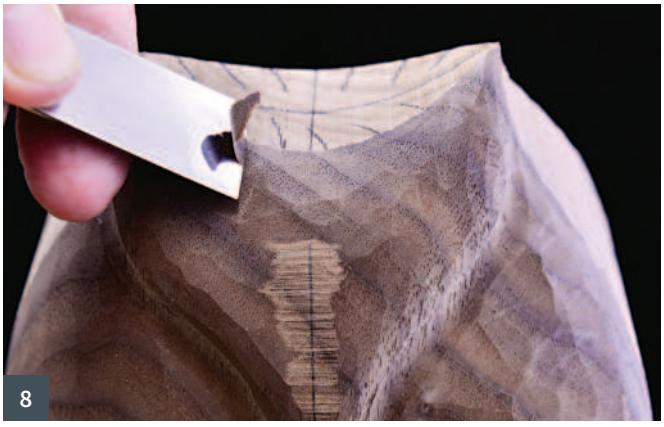


PHOTOGRAPHS BY ANDREW THOMAS

1 Scan or photocopy the scale drawings provided, enlarging them to the correct size for your wood. Print them out onto card and use them as templates to transfer the designs onto the front and side of your perfectly square, prepared block, ensuring that they are in precise alignment with each other and that there is enough spare wood at the base to attach to your faceplate, 30-40mm.

2 Cut the front view profile out first, then re-form the square block using masking tape and continue to cut the side view profile. To help simplify the shaping around the lower edges of the owl, cut along the horizontal lines at the very bottom edge on both faces, as if you were going to cut it off the base, but stopping at 20mm before the centre of the owl on all sides, leaving the form attached to the base by a 40mm square section underneath it.





3 Mount your form securely onto your vice and then measure and mark centre lines on all four sides of the form using a flexible rule to assist you.

4 The next step is to cut out the upper part of the head and beak from your template and use it as a guide to transfer these details accurately directly onto your wood. Be careful not to bend the template or you will end up distorting the design.

5 Use the No.9/10 to carve a groove directly along the outside of the lines on both sides of the head, from the tip of the beak up to the position of the ears.

6 Use the No.2/20 to pare the wood back to the depth of the No.9 cuts. Repeat steps 5 and 6 until you create a tapered depth from approximately 3mm underneath the beak, 8mm along the side of it and up to 15mm underneath the ears.

7 The area where the eyes will be positioned can now be evenly curved; from the line of the head that you have just produced, around to the centre line on the side view, and down to the halfway position where the grain changes direction.

8 This upper part of the head can now be evenly curved and naturally shaped all over; from the tip of the beak up to the horizontal centre line between the ears.

9 Next move to the lower section of the owl; working from just below the middle line on the square edge down to the feet, and repeating the process of creating an even contour across the body, but from the centre line below the beak on the front face to the centre line on the side. If you attempt to carve in a downward direction from the very middle position, you may find that the wood will lift and split here due to the grain changing directions.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10 The middle position can now be evenly blended into the areas above and below it but this time carving 'across' the grain.

11 At this point we just want to create the general shaping of the feet and surrounding areas, we shall return to finish them later, in step 26. Use the No.9/10 gouge to create an even curve from the centre line on the side to the centre line on the front. Blend it evenly into the area above with the No.2/20.

12 You can now curve the lower edge from centre to centre.

13 Study the form from all angles to ensure that it is symmetrical on both sides. A good visual position to do this is from above looking down over the body to the feet; square your eyes on the flat edge of the base and use your peripheral vision to check that the depths are even up through the form. Make any adjustments if necessary to produce a clean even surface.

14 Use the same methods as outlined above to produce a beautiful, even contour from the centreline on the top of the head down through the body to the base of the feet.

15 Your carving should now look like this.

16 The next step, using your template as a guide, is to measure out from the centreline and mark onto your wood the precise position of the eyes of the owl. Use a drawing compass to draw the eye circles and then the No.9/10 gouge to carefully carve a groove directly around the outside of these lines.

17 Use the No.2/20 to pare the wood evenly into the surrounding areas. Repeat steps 16 and 17 until you reach a depth of approximately 4-5mm at the outer edge.

18 Now use the No.9/10 gouge again to carve a groove directly around the outside of the inner eye circles.

19 Carefully blend this evenly into the surrounding areas of the larger circle, and then finally pare over the outer square edge to produce a gentle connection between the eyes and the body.

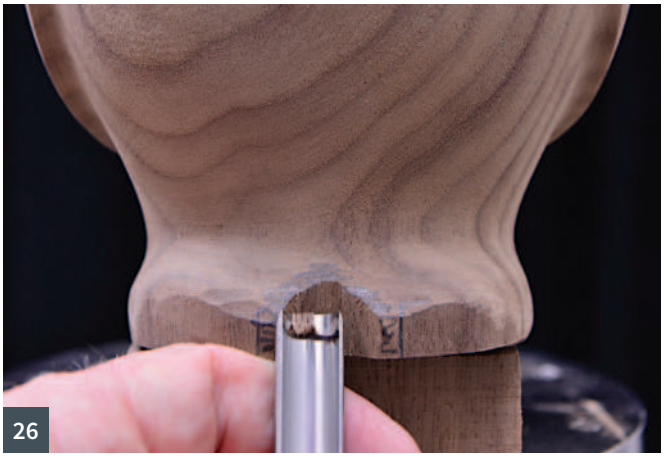
20 At this stage before you carve the wings of the owl, it is good practice to sand over the entire surface and details, which will bring them to life and allow you to visually check that the contours are all evenly curved around the complete owl. Use a piece of 100-grit aluminium oxide sandpaper, preferably Abranet, carefully following the line of the grain where possible, and work across the entire surface of the owl, completely removing all tool marks and smoothing the details naturally together.

21 Using the templates provided as a guide to help you, draw the lower line of the wings onto the sides and back of your owl. Check them from all angles for symmetry. When you are happy all is correct and in proportion, carve a groove directly along the outside of their line.

22 Blend the depth of the groove evenly into the surrounding areas. Repeat steps 21 and 22 until you reach a depth of approximately 6-7mm.

23 The area below the back of the wings and just above the feet will lastly need to be evenly blended together.

24 Using the templates again to assist you, draw the upper line of the wings onto your wood and cut a groove directly along the outside of them.



25 Blend the grooves evenly into the surrounding areas. Repeat steps 24 and 25 until you reach a depth of approximately 6-7mm.

26 Finally, we return to the separation of the front feet. Using the front view template as a reference to help you, measure and mark onto your wood the area in between the feet that is to be removed – approximately a third of the width of this lower edge. Use the No.9/10 to carve the groove in this centre position, down to a depth of approximately 6mm. Use the No.2/20 to curve the connecting areas evenly into the centre groove, and then to create a natural contour over the square front edge.

27 Start with 100 grit again and work over the areas that you have just carved, naturally blending them into their surrounding areas. Dust off the surface thoroughly and then brush or pour hot water over the complete owl and leave it to dry, thus raising the grain and allowing the following grit to be worked more easily and effectively. Next, work through grits 150, 240 and 400 over the complete owl and repeat the hot water process in between each grit. A hair dryer can be employed to dramatically accelerate the drying process if you wish. The carving can now be cut off the faceplate base and sanded along the bottom edge.

28 Dark species of wood such as American black walnut look extremely beautiful when finished with a combination of boiled linseed oil with a wax polish on top. The boiled linseed oil darkens and enriches the colour and figuring of the grain and the wax adds protection from UV, ingraining dust and ultimately produces a lovely professional finish. If you wish to use this combination of finish, don't strive to really soak the wood with the oil, it literally just needs enough to penetrate the grain and pores of the wood. If you soak it with oil, it takes a very long time to dry properly enough for the wax to give a good finish and it can also clog and go rubbery in corners, requiring it to be scratched out. Another important fact to be aware of when using oil finishes, is that the cloths used for applying the oil are extremely vulnerable to spontaneous combustion and must be disposed of carefully and safely – ensure that you always read the safety instructions on the label about this.

TURNING DRAWER PULLS AND DOOR KNOBS

Richard Findley introduces the basics of turning furniture accessories

Many pieces of furniture feature a pull or knob. Anything with a door or drawer has a need for some sort of handle, and while trends and fashions change, turned wooden knobs have been with us for centuries and continue to feature on modern furniture.

A search of almost any furniture, kitchen or bedroom manufacturer's catalogue – online or otherwise – will show a huge array of variations on the classic style. Over the years I must have turned hundreds of them and while the basic design is similar, it's surprising how small changes in diameter or the addition or removal of a fillet or other detail, can totally change the look and feel of the pull. There are also variations in the fixing method of the pulls and grain direction. In this article I will show the basic turning operation for two knobs in a classic design – one will be end grain, one will be cross grain. I will also explore work holding and fixing options.

WORK HOLDING

As with any turning job, one of the first decisions to make is how to hold it on the lathe. My natural inclination is to work between centres for spindle work, which is fine, leaving just a small parting-off nib to remove by hand at the end. I have also turned cross-grain knobs in this way without a problem. Depending on the design, a very good alternative holding method is a screw chuck. The problem with most commercial screw chucks, however, is that they are designed to hold a bowl blank in the initial roughing stages, so usually have large coarse threads designed for that purpose. This, of course, is total overkill for a small item such as a knob or pull, so a homemade version is the best way to go.

MAKING A SCREW CHUCK

The great thing about making your own screw chuck is that you can use a screw that will suit the job in hand perfectly. I often use a coach screw, which is strong with a relatively coarse thread. These are available in diameters from 6mm upwards and in assorted lengths. It is always useful to know how the finished product will be fixed,

because it may be that the size of screw used won't matter, but in some cases, it could be important. If the intention is to use a fine screw through the drawer front or door, a smaller diameter screw is needed in the chuck. For this job I made a screw chuck using a number 8 or 4mm diameter screw.

Making the screw chuck is quite straightforward. I turn a scrap of hardwood between centres and form a chucking spigot on one end. Any offcut of wood would be fine but if you intend to reuse the chuck repeatedly in the future, a good hardwood is best, I use sapele as it is strong and I always have plenty of offcuts lying around. The length of the wood used for the screw chuck is mostly down to the length of screw you decide to use. Here I'm using a 60mm-long screw as it's what I have to hand, and there is rarely need for more than about 20mm of screw protruding to hold the work, so around 40mm of wood works well here.

I hold the turned block in the chuck and use a Jacobs chuck to drill a pilot hole through the centre. The screw can then be driven in, using a generous blob of epoxy resin to secure the screw permanently. Sometimes, when you run the lathe with just the screw chuck, the screw appears to wobble. This used to really bother me but I've found that, unless it's really bad, it isn't worth worrying about. It is possible to hold the screw chuck by the screw and lightly true up the chucking spigot to bring it all into alignment, although there is too much flex with this size of screw to be able to do this effectively.

TURNING

I'll start with the end grain, or standard spindle-turned knob. The design of this pull has a spigot or tenon to allow fixing. As with any production job, I begin by making a template or story board, showing all of the important diameters and the positions of all the details. With this made I can rough down the sapele blank to a cylinder and mark the details.

If I was making three or more, I would set up my duplicating fingers, but as this was a one-off for the article, I simply use Vernier callipers with my beading and parting tool to size the tenon and the fillets which guide the curves of the base and grip part of the knob.

After cutting the 16mm diameter tenon, I use the tip of my beading and parting tool, just as you would a skew chisel, to slice down the end grain of the base of the knob to ensure a clean and tear-free surface with a slight undercut. This ensures the knob will sit neatly against the drawer front or cabinet door, once installed.

Having blocked out the shape, I can switch to my 10mm spindle gouge to form the curves. The only tool swap I have to do after this is to my 6mm spindle gouge to form the deep, narrow cove. The waste at the end is reduced to a small nib, just big enough to drive while I sand with 240 and 320 grit. Satisfied, I can part it off, which can be done with any tool, but I choose to continue using my 10mm spindle gouge.

PARTING TOOLS

Either a skew chisel (in my case I use my beading and parting tool as a skew) or spindle gouge is fine for parting. Oddly, a standard parting tool isn't the best tool for parting as it leaves a torn finish on end grain because of the way it cuts. I would generally recommend that parting is done with the same tool as the shaping – that way there is consistency in the cut. If a different tool is used, the pressure applied to the work can be different and the way the tool cuts is slightly different, leading to pressure marks and potentially different textures on the wood.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PHOTOGRAPHS BY RICHARD FINDLEY

1 Almost any screw can be used to make a screw chuck **2** The screw chuck ready for action **3** Marking out with a story board **4** Sizing the fillets

5 Slicing the base of the knob to form a clean undercut **6** Shaping the knob **7** Forming the narrow cove

PARTING OFF

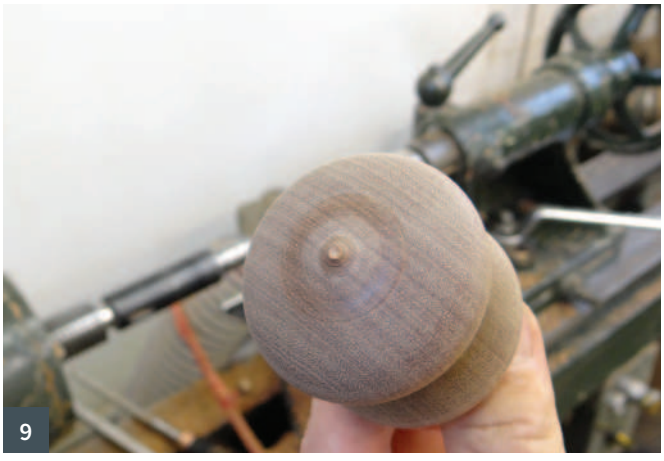
You might notice the knob is held with its face at the drive end of the lathe. This may seem counter-intuitive but allows safe and simple parting. As I cut through the nib, the knob simply stops turning and drops into my hand, leaving just a small amount of tidying work to smooth the face of the knob. If the knob is mounted the other way around and is parted, the knob continues to be driven but without tailstock support and so results are much less predictable.

Having safely parted the knob from the lathe it is a simple case of paring away the nib with a sharp chisel and hand sanding and blending anything that remains into a smooth and blemish-free face. If I have made a large batch, I might mount a sanding arbor in the chuck and power sand away the nib. This works well but it goes almost without saying that care needs to be taken with this approach to avoid misshaping the face of the knob against the powered sanding pad.

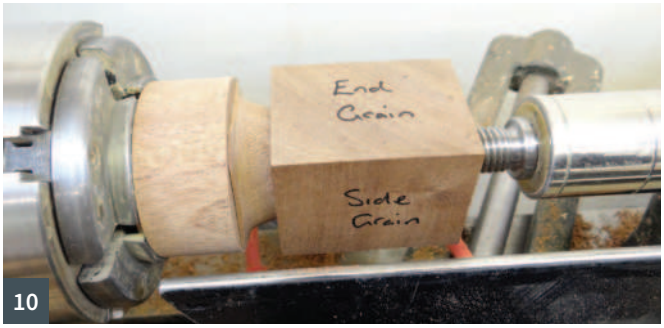
CROSS-GRAIN KNOB

The difference between the two styles of knob is subtle in this sapele, although in timber with a stronger end grain pattern, such as oak, the difference is easier to spot. The main purpose of a cross-grain knob is to keep the grain patterns across the front of a set of drawers or cabinet doors all the same, without the difference in grain pattern attracting undue attention. End grain also tends to end up a much darker colour under a finish, whereas the side grain will remain more consistent with the rest of the furniture. Some timbers have attractive figure, such as the rays in quartersawn oak or a ripple in sycamore, which shows up only in the face grain and would be lost if only the end grain was showing.

A screw chuck is a good option for a cross-grain knob as screws always bite and hold better in side grain than end grain, meaning the final fixing is often a screw as well, so the hole left by the screw chuck



8 Parting off with the spindle gouge **9** A small nib can be pared off and sanded smooth



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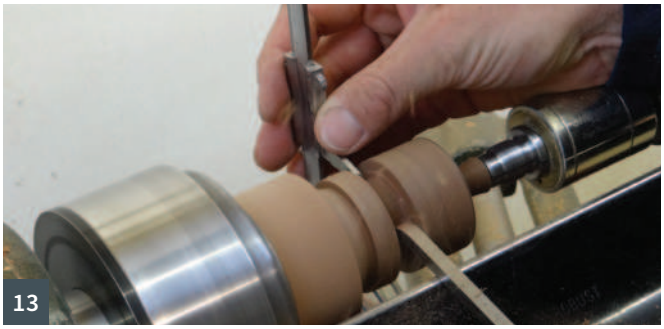
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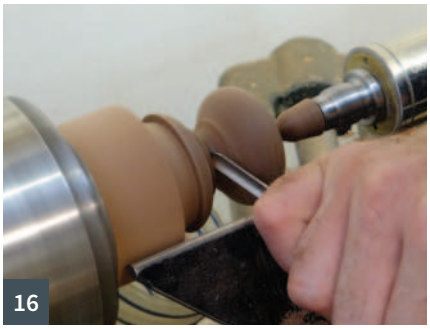
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10 Cross grain knob mounted on the screw chuck **11** The cross-grain knob and screw chuck, showing the spacer block **12** Roughing out with the spindle gouge **13** Sizing the fillet with a scraping cut **14–16** The shaping process of the cross grain knob with the wing of the spindle gouge

acts as a guide for this – as long as you haven't used too big a screw in your screw chuck.

I realised that I had left too much of the screw protruding from the screw chuck so added a waste spacer and turned this down out of the way. If the base of the knob has a specific diameter, the waste block can double as a sizing block too, saving the need to measure.

Because of the grain direction, the forces involved in the turning are higher, with alternating end and side grain passing the cutting edge of the tool, rather than the more consistent surface of normal spindle turning, so I continue to use the tailstock for additional support. There is a risk initially that the force of the cut can cause the blank to spin on the screw chuck, making it impossible to turn, so a little caution is advisable at the start.

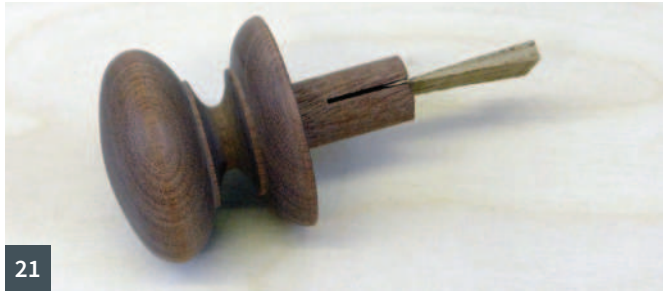
I find it best to rough the blank down to a cylinder with a spindle gouge rather than a roughing gouge as the cut is a little more gentle and the tool can be presented in such a way as to slice the waste away cleanly and quickly. Once it is round and to size, I once again mark it with the story board and can begin shaping.

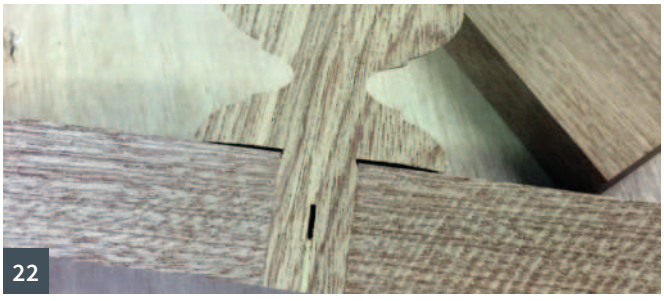
The biggest difference between end grain and cross grain is the way that you approach the cut. End-grain knobs are normal spindle turning, so shapes are formed from the toolrest down to the centre of the spindle – downhill. Cross-grain knobs are essentially tiny bowl blanks, so cutting in the same way would be working against the grain and would most likely result in tear-out. To form the shapes in cross-grain blanks, the gouge needs to be rolled on its side, and the wing of the tool used to draw the cut with the grain, apparently uphill – although it is in fact still downhill, it's just that the top of the hill is now in a different place.

I still begin shaping by cutting the fillets, but the cut with my beading and parting tool is much slower and carefully taken and is actually a scraping cut – the tool becoming a negative rake scraper – rather than a normal peeling cut with a chisel. Once to size, the rest of the shaping can continue as described above, using the wing of the tool.

Cutting the cove can be challenging as the initial cut has to be into the wood and somewhat against the grain, but can soon be adjusted to the drawing cut with the wing of the tool. It is important to keep the tool rolled on its side so the cutting edge is presented in a trailing cut to avoid any chance of a catch.

Once I'm happy with the shape I can remove the tailstock and the waste, blending the curve of the face with my gouge before sanding. The great advantage of using the screw chuck is that it gives full access to the face of the knob and allows easy blending and sanding without the need for hand work at the end.





17 Cleaning the face **18** Sanding **19** The difference between the cross grain (top) and end grain (bottom) knobs **20** Fixing methods for knobs and pulls **21** The wedged tenon before fitting **22** Cross section of a wedged tenon fixing **23** Replacement threaded knobs

FIXING METHODS

There are many options for attaching the knob or pull in place. The most simple, and perhaps crude, being a screw driven through a drawer front or cabinet door and into the base of the pull. This relies entirely on the screw holding the knob in place and I'm sure most people have experienced that, over time, the knob will begin to work loose, coming unscrewed. Once this has happened it is only a matter of time before the thread entirely strips and it is largely irreparable.

An improved method is to have an insert fitted into the base of the knob and a machine screw passed through the drawer or door and screwed into place. This is commonly found on many commercial/mass-produced kitchens and is considerably more reliable than a simple wood screw. I find the inserts tend to grip best into side grain rather than end grain, but have successfully used them in both.

A fixing method that alleviates the need for screws and commercial fittings is the use of a turned tenon. Usually this is simply glued into a drilled mortise and gives a very neat result but is reliant on the glue to hold. An improvement on this is to make the tenon a through-tenon and add a wedge. I love the simplicity and natural strength that a wedge gives. By cutting a saw kerf roughly three-quarters of the way down the length of the tenon, a wedge can be cut and, once the knob is in place and correctly positioned for grain direction, the wedge can be driven into the kerf, spreading the tenon and permanently holding the knob in place. The addition of glue to the tenon and the wedge will only make the whole thing stronger and more effective. Care should be taken to ensure the kerf is cut in the correct direction, so when the wedge is driven in, it doesn't split the timber of the drawer front along the grain.

The final method of fixing that I have used is a screw thread cut into the turned tenon. This is mostly seen on antique mahogany furniture and works extremely well. I have to make replacements from time to time, but the fault is usually with the base of the knob breaking, rather than there being a problem with the thread. Originally the workshop that made the furniture would have had a tool called a thread box, which is essentially a block of wood with a small V-shaped cutter fixed into it, so when a knob with a turned tenon of the correct size is screwed into it, it cuts a perfect thread, which would correspond with a matching tap, allowing the cabinetmaker to easily and quickly make matching threads. The trouble for a restorer (or at least a turner who dabbles with restoration, such as myself) is that I don't have the tap and thread box sets of the old cabinetmakers so I have to do my best to match the threads of the old, damaged knobs as best I can.

There are a few ways to form the threads by hand, but with trial and error I have settled on a combination of a wood carver's V-tool and a triangular file. I set a pair of dividers to the pitch of the thread I am trying to replicate, i.e. the distance between the high points of the threads. I then use this to mark out the spiral pattern. It is a little like setting out for a barley twist, but because the size is so much smaller, the marking tends to be fairly approximate, as the tools are used to cut the threads, the rough lines are tidied, straightened and made more crisp. Luckily, these threads are quite coarse and the fit is not as critical as a metal machine thread. As long as it engages and seats properly in the fully done-up position, they will work.

FIRST-AID PRECAUTIONS

Geoffrey Laycock outlines the importance of preparing for workshop mishaps and accidents

We all try not to have injuries when in the workshop, but however careful we are, it's inevitable that we'll have an accident or mishap from time to time. These things are often not too serious, but they are annoying and have the potential to become more serious if not taken care of. Splinters are probably the most common problem for woodworkers, as well as cuts to hands and getting 'stuff' in an eye. It is wise to spend a little time and money at your local pharmacist so you have basic first-aid items to hand that can ensure you keep on working and reduce the risk of matters getting worse.

What you need in your first-aid kit

You can buy complete first-aid kits, including some that come with contents specifically intended for compliance with legal requirements to have at work. Buy one of these if you wish, but many of the contents may sit for years with little practical value to you. Generally it's better to get a sealable plastic box and stock it with things you will use, plus a few just-in-case items.

The following is not intended to be a complete list, and it is up to you what to add. Some items may be used frequently for minor ailments, while others are only for that more serious time we all hope never happens. Also remember: seek medical advice if you have any doubts about a wound.

- Tweezers with a sharp point – for removing those annoying splinters
- Scalpel blade number 10A or 11P – both have a sharp point and straight cutting edge. These blades are intended to be used edge-side up to push into skin, then lift to create an incision. Use when a splinter is deep and tweezers won't reach
- Spray wound cleanser – for use on wounds, plus on tweezers or blades before use
- Antiseptic wound wipes
- Wound closure strips – often called SteriStrips, which is a brand name
- A range of waterproof elastic plasters
- Elastic adhesive tape/microporous tape – to go over plasters and keep them in place
- Spray plaster – good for little nicks in places a conventional plaster won't work
- Sterile wound dressing pad, medium size – just in case you have a big one
- Wide adhesive bandage – to use with a sterile wound dressing
- Small pair of scissors

PHOTOGRAPH BY GEOFFREY LAYCOCK

- Bottle of eyewash
- Bottle of surgical spirit for cleaning skin and removing plaster adhesive

Common problems

Here are a couple of examples of what can happen, and did to me in both cases. First, a simple splinter. I was working with pau amarello and got a small splinter in a finger. I couldn't get all of the splinter out and ignored it, thinking it would emerge at some future time. Just 12 hours later I had a hard, red, swollen area and an allergic reaction where the splinter resided. I then had to resort to scalpel blade 10A to cut the skin above the offending sliver – and learned a valuable lesson.

The second example was around 30 years ago. I was obsessed with my lawn and almost daily would root out individual weeds or unwanted grass types using a short, very pointed penknife. One day, trying to get a weed out I hit a buried stone. Pulling upwards against the unseen resistance the blade suddenly came out of the soil and straight into my left wrist. I was kneeling down and resting my left hand on the ground. The blade went straight through a diver's watch strap, into my wrist and stopped at a bone. I knew this could be big trouble and carefully pulled the blade out. So much blood. Had I hit an artery? With thumb pressure applied I quickly decided to drive to my local A&E department less than a mile away. I wound a clean tea towel around my wrist and held it in place with a belt.

On arrival I was seen quickly and efficiently. I hadn't hit an artery, nor tendon, nor nerve. Very lucky, but you now know why I have a sterile dressing and a roll of wide adhesive bandage in my box. Hopefully I will never need it – my grass care now involves a garden tractor/mower.

One final precaution: check your Tetanus protection is up to date – talk to your GP practice nurse.

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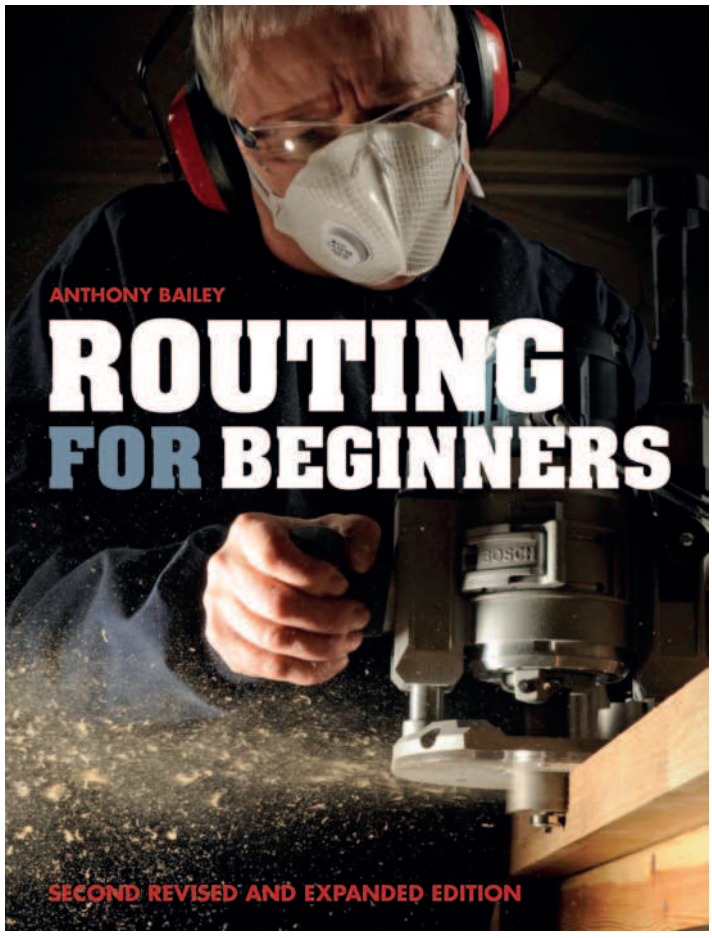

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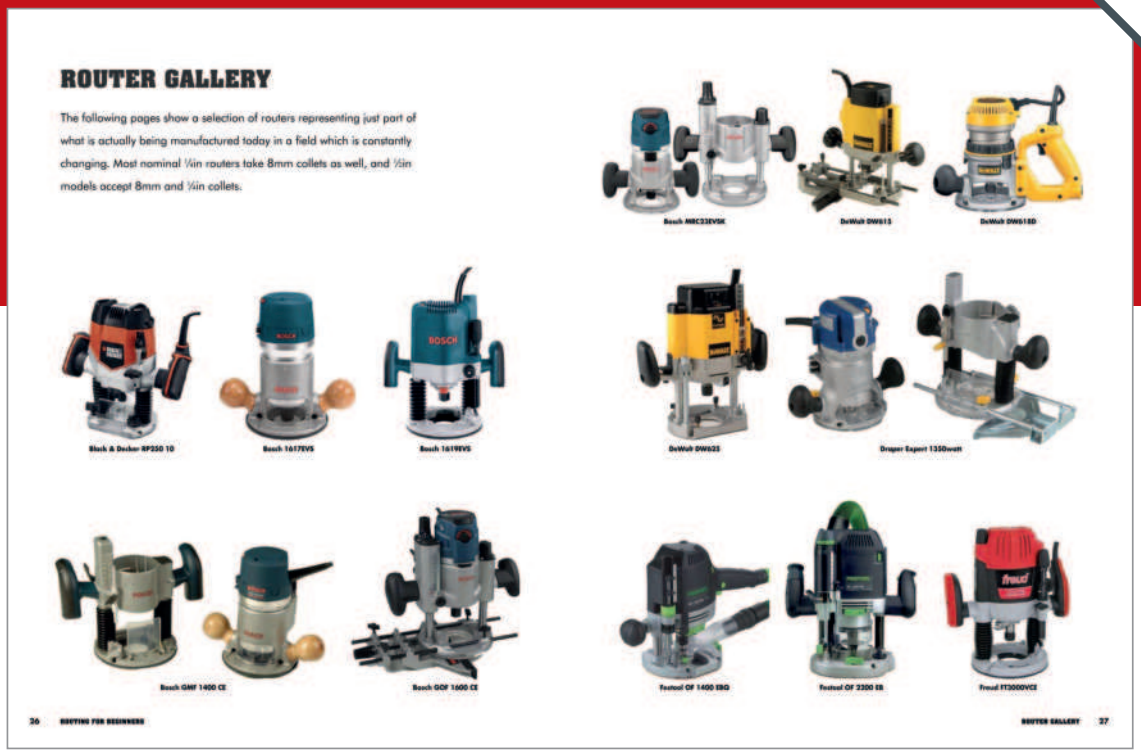


ROUTER GALLERY

The following pages show a selection of routers representing just part of what is actually being manufactured today in a field which is constantly changing. Most nominal ¼in routers take 8mm collets as well, and ½in models accept 8mm and ¼in collets.

Bosch MRC32EVSK · DeWalt DW615 · DeWalt DW618D

Black & Decker RP250 10 · Bosch 1617EVS · Bosch 1619EVS

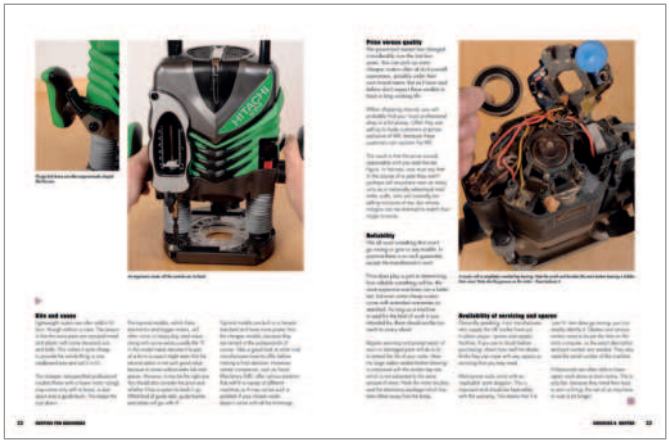
DeWalt DW625 · Draper Expert 13500watt

Bosch GMF 1400 CE · Bosch GOF 1600 CE

Festool OF 1400 EBQ · Festool OF 2200 EB · Freud FT3000VCE

26 GETTING FOR BEGINNERS

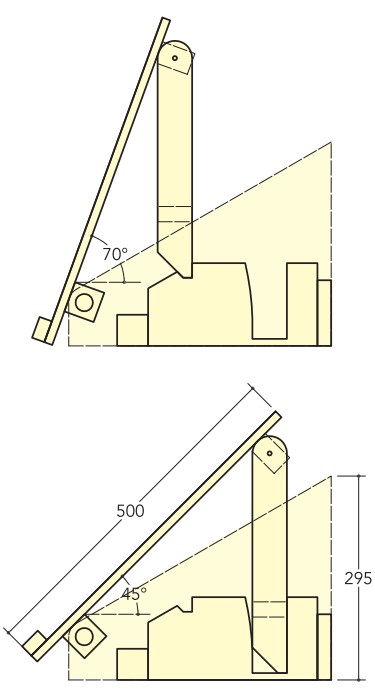
ROUTER GALLERY 27



ARTS & CRAFTS WORKSTATION

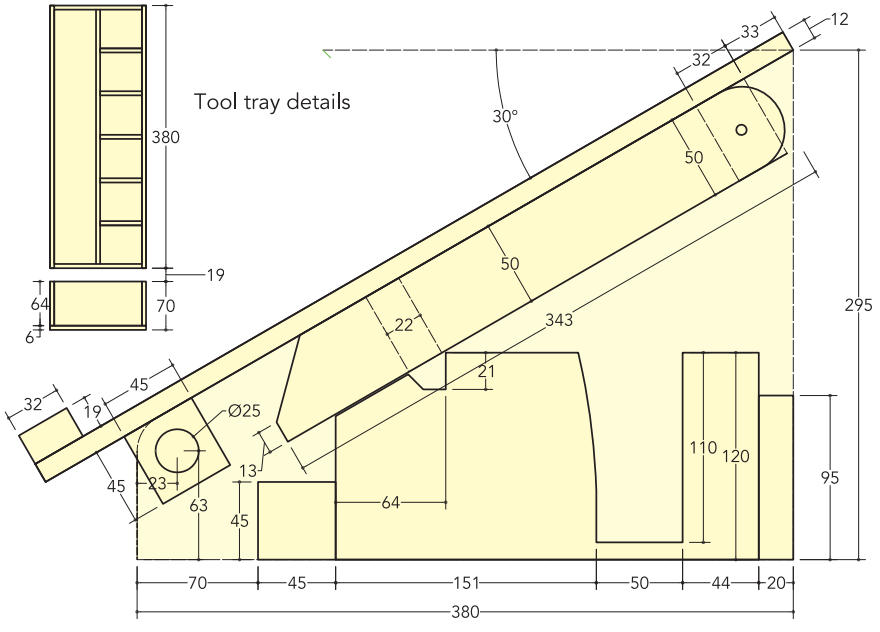
Mark Baker and Anthony Bailey make a portable, adjustable crafts desk

This desk is designed for artists, crafters, designers and carvers and affords the user flexibility in how it is used. The design incorporates feedback we've received over the years from crafters about how they work and what they want from a workstation. Making any project is in fact about prototyping – the design not only has to look right but also work well in a variety of situations and of course be robust enough to withstand heavy-duty usage without collapsing. So we have made for you a vari-angle desk cum drawing board, which we have christened a 'multi-function workstation' with preset working angles of 30°, 45° and 90°. We worked out all the construction problems so that you can make one straight from the drawings without difficulty.

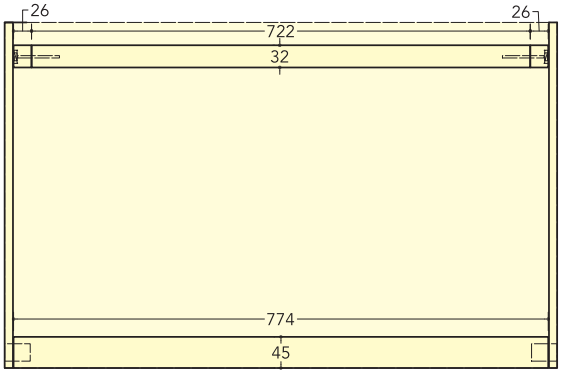


Side Elevations/Sections

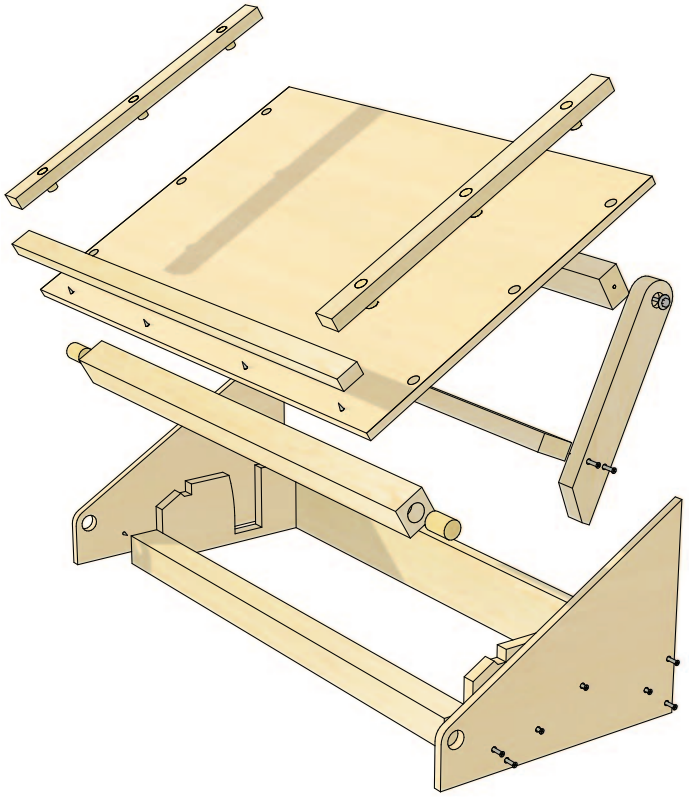
Tool tray details

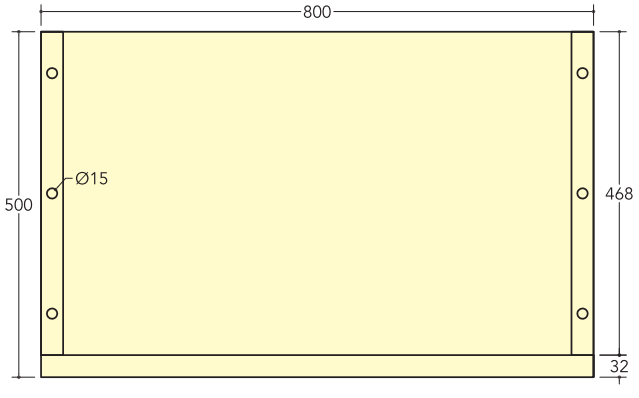


Side Elevation/Section



Plan/Section





Plan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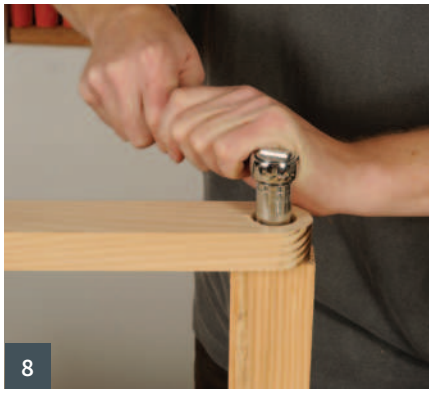
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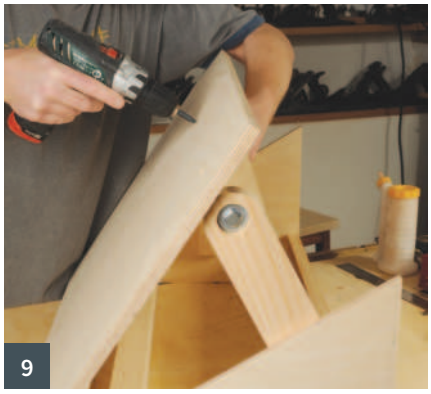
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PHOTOGRAPHS BY FRANCESCO CREMONINI AND GIACOMO MALASPINA

Basic construction

1 The board and the angled sides are made from 12mm birch ply. These can be cut by machine or by hand and if necessary cleaned up with a hand plane to give straight square edges.

2 Drill a hole to accept a stub length of dowel …

3 … and coat at one end with glue, then push home. A tap with a hammer will bed it in the hole and the surplus glue can then be wiped away. It should be overlong at this stage so it can be trimmed off later.

4 The two 30° angled end pieces have the leading corner radiused so the board will tilt. Bore two holes right through using a 25mm Forstner bit with a sacrificial board underneath to prevent breakout. The positioning is critical for strength and for allowing free board movement.

5 The frame pieces that fit between the angled ends need to be about 1-1.5mm longer than the radiused component already glued to the board so that the board can swivel freely. Predrill two with glue and 50mm slim twinfast screws used for assembly. The carving board has to be added before the other end is attached.

6 The front frame piece is made from 50 × 50mm PAR glued and screwed in position behind the radiused component. The two frame pieces will give the whole assembly the required strength.

7 Cut a length of 50 × 32mm PAR to the length indicated on the drawing and also cut the two stays to length with a bevel at the bottom end and round at the top end, as shown on the drawings. They then need to be drilled to take coach screws, as are the ends of the 50 × 32mm. Use a Forstner bit to create recesses for the washers and heads.

8 Next, use a socket and handle to fit and tighten the coach screws so there will be minimal movement, avoiding any tendency to waggle around.

9 Fit the bar and stays and glue and screw through the front face of the board, ensuring it is correctly centred and level.


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Stay blocks

10 Now the 45° angle needs to be set. This isn't absolutely critical but it should be the same at each end. You may have to experiment to achieve the correct means of setting and altering the stay angle(s).

11 Having got the board angle correct, the stay needs to be dead upright. Once you know these positions, you can make a receiving socket for the foot of each stay to sit in.

12 This was our first attempt at creating a single socket for just the 45° angle, the 80° one was worked out next. The socket recess has one angle side as the stay will slide in and out at an angle, or more correctly, an arc.

13 Here you can see the 45° block sitting in position. This was the 'Mark 1' version and we hadn't yet cut a bevel on the bottom of the stay as this was still to be worked out.

14 The blocks for the stays need to be simply screwed in position. On our design, we wanted to be able to alter or replace them as the design evolved.

15 At this point the strut between the stays needs to be fixed in position. This would mean we could move the stays easily in a controlled manner while sorting out the support blocks.

16 The stays can now be bevelled as it is obvious the square ends would catch on the blocks and prevent the board from closing properly. To do this, draw a template of the bevel to simplify setting out both the 45° and 80° block profiles.

17 Here is the final shape that we evolved to hold the end of each stay. You could make the same thing from just one piece of 18mm ply.


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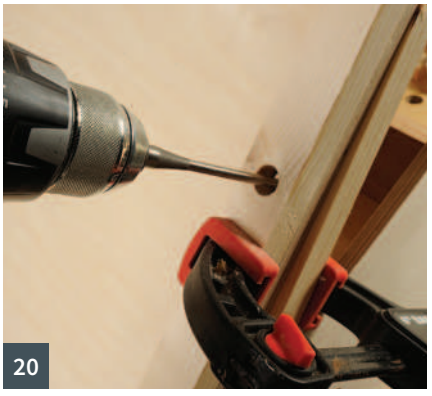
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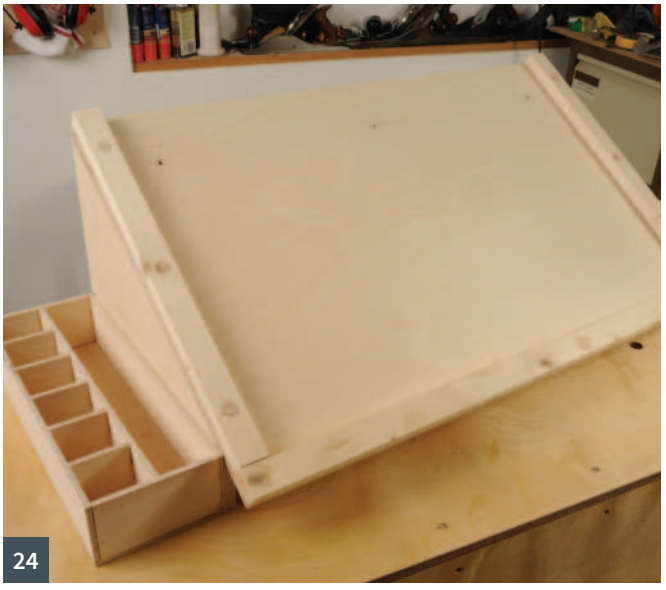
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Tool trays and end stops

18 At either end of the board there is an identical tool tray. It consists of square recesses to hold carving tools in a vaguely upright position and a long tray for other items. The square compartments should be butt glued together first – ours were all made with 6mm birch ply.

19 Next, glue the long compartment ends, tape into position, then leave to dry. The bases can then be glued on, using MDF, but some spare 6mm ply will do just as well.

20 The board has a fillet glued along the bottom edge to support the carvings. At each end similar fillets are used as removable stops, the holes are bored straight through both fillet and board with a sacrificial piece underneath. Three holes per end are enough.

21 Glue matching-size pieces of dowel in the holes and leave to set. Flush them off smooth on the top face and underneath, cut fractionally under board thickness before slightly chamfering the leading edges.

22 Plug the end stops and unplug from the board as required. Note how the tool tray sits neatly along the side as the board rotation dowel has been sawn off flush with the angled-end board.

23 The easiest way to mount the tool trays is to use wide stick-on hook-and-loop strip. Experience shows that it will need stapling around the edges to keep it in place. You can have matching hook-and-loop inside the unit for neat storage in transit.

24 The workstation is now ready for many hours of use!

WILLOW HANGING BALL

Naomi Walmsley and Dan Westall's simple project is ideal for crafting with kids

This attractive ball can be used for lots of different things. You can hang battery-powered LED tea lights in it as a simple way to decorate your doorstep or garden, or even hang bird food inside it. Remember, it is supposed to be rustic, so don't worry too much about it looking neat and tidy.

ABOUT THE PROJECT

- Suitable for: Age 6+ (will need adult assistance with the initial wreath-making stage)
- Time: 40 minutes+
- Tools: Secateurs, scissors
- Materials: Approx 30–40 willow rods 1m long, garden twine, yarn (optional)

Where to find willow

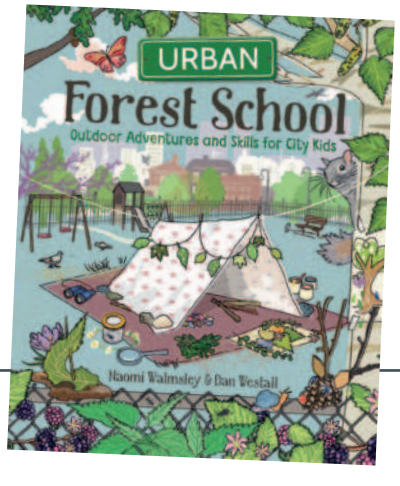
You need willow for this activity. If you are lucky enough to have access and permission to cut living willow sticks from a tree, that's great. Use your secateurs and cut 1m lengths of thin willow sticks. You'll need to strip the leaves off before you start to weave. If you do not have access to a tree, there are plenty of willow suppliers online that you can order the sticks from.

How to soak dried willow

If you buy dried willow (often referred to as rods) you will need to soak these to rehydrate them before you can use them. Using a bath is fine. The general rule is one day of soaking per 30cm of willow. For example, if your willow was 1m long, it would need three days to soak. After it is soaked, leave it outside under a damp sheet and a tarpaulin overnight to help make it super supple.

How to make willow balls

1. Start by making three to four willow rings. We will call these 'wreaths'. Start with the thicker ends of the rods and finish with the thinner. Take your first rod and weave it into a rustic hoop, about the diameter you want your final ball to be, leaving a tail piece sticking out. These will all get cut and tidied up at the end.
2. Add another rod to the wreaths, starting a quarter turn away from your first, again leaving the tail sticking out for the time being. Add a few more rods to each wreath in the same way. It helps to think about your wreath like a clock with the first stick starting at 12 o'clock, the second stick starting at quarter past, the third at half past and the fourth at quarter to.
3. Snip off any untidy ends with the secateurs.
4. Once you have three to four wreaths all the same size, you are ready to assemble the ball. Slip one wreath over the other to start building the ball shape, making a cross shape at either end. Tie the first two circles together at the top. You can tie a little knot to secure the bottoms too. They will be cut off at the end so don't worry about making your knots neat. You can add another wreath in the same way if you like, but this is optional.
5. For your final wreath, slip it over the top down to the middle, like a belt holding all your other wreaths in place. This will create the three-dimensional structure.
6. Once the rings are all in place you can start filling in the gaps. You can use further lengths of willow to weave in and out of your ball, tucking the ends in wherever they reach, or use yarn to give it the look that you want, tying the strands off randomly. Remember, it's a rustic ball so don't worry about making it completely neat. Don't forget that if you want to put something into your ball like a fat ball for the birds or a tea light, leave a bit of a gap somewhere so that you can place the fat ball inside.
7. Add a little string hanging loop at the top and hang wherever you like – for you, for the birds or for the garden.



Extract taken from *Urban Forest School* by Naomi Walmsley and Dan Westall published by GMC Publications and available now for £16.99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PHOTOGRAPHS BY GMC PUBLICATIONS

THE BEAUTY OF BEADS

Colin Sullivan digs deep into his collection for three tools to make furniture beads by hand

The simple bead is a very seductive detail with the ability to completely change the look of a piece of furniture. Used sensitively around a drawer front for instance, a fine cocked bead can lift it to another level. This feature however, has a use beyond aesthetics. A bead was used in the past to help disguise the joint between two boards that were not glued together. Beaded edged ledge and braced boarded doors are another good example where the shrinkage of the joint is balanced by a bead on one edge of the boards – a case of two joints are better than one. These are essentially references to their use in joinery applications but the same principles apply to furniture making. A common example would be to make the bead the same size as the knuckle on a hinge and incorporate them as one continuous detail.

The knuckle of a hinge can be lost in the bead detail. Over time the patination of brass fittings and polish can make them practically invisible

The mouth of this beech moulding plane is still crisp and has plenty of life left in it

Beads are often incorporated into much larger mouldings and may well be used to soften the coming together of two components; meeting stiles for example on a pair of cupboard doors and on the dividing rails between drawers, a common feature on early 18th-century furniture.

MOULDING PLANES

The router and spindle moulder can be used to make beads easily, but this article will focus on some of the tools and techniques you can use to create them by hand. I began by digging into my old toolbox for a beech beading plane. They were made in several sizes from ⅛in diameter up to ¾in diameter. Planes like these can be very useful for certain jobs, because once you've set and sharpened them properly, they're ready for use without the need to do any setting up. What a pleasure it is to be able to just pick the size of bead you want and get straight on with the job. For once the tedium of setting up the router or spindle can be given a miss.

BUYING MOULDING PLANES: WHAT TO LOOK FOR

If you are thinking about buying some vintage moulding planes, look for ones that haven't had too much use. Commonly linseed oil was used on them for protection and to stop them drying out and cracking, so they are very attractive to woodworm. Beech makes a good meal for woodworm so steer away from any that are really worm eaten. Check that the plane's mouth is sound and the cutter is not too rusty to sharpen properly.

In the Tool and Trades museum at Amberley, West Sussex, there is a large collection of moulding planes with by far the most for making beads than for any other shape.

Wooden plane making was done by hand using matching planes of the opposite profile. The work was carried out by highly skilled craftsmen, often specialising in this type of work. A full set of 10 bead planes from ⅛in diameter to 1in diameter was offered by Marples in 1909 for 21/6d, and you could have the skew bladed version for another 3d per plane. The history of wooden plane making is well worth studying. Most towns of a decent size had a few plane makers in the 1800 and 1900s. There are a number of technological advancements that heralded the demise of this unique craft and it finally ceased in the 1950s.

Incredible works of art in their own right. Note the dovetailed boxwood inset on the sole of this fine bead plane

No less complicated than the other example, boxwood insets are preferable

PHOTOGRAPHS BY ANTHONY BAILEY/GMC PUBLICATIONS

THE 45

One such development was the increasing profligacy of the metal plane. Stanley's answer was to design a plane where just the cutter could be changed to make almost any shape of moulding. By 1884 the famous 45 was in use in America, a seven-purpose tool, making it possible to cut rebates and beads with the same plane. I find these are not as easy to use as a wooden plane, but with careful adjustment they can be quite successful. The 45 soon became an established part of the joiner and cabinetmaker's tool kit, and even now they're still easy to obtain on the second-hand market. Clifton produce sets of replacement blades available from regular stockists of their tools.

This Record 45S first appeared in the 1938 catalogue and is the same as the Stanley 45 with the addition of a simple screw adjustment added to the cutter blade

Even a pip like this can throw you off course when running beads by hand

This Stanley No.66 requires a little investment

CUSTOMISED SCRATCH STOCK

A far cheaper way to make a bead is with a scratch stock. This simple tool can be made quickly from an old marking gauge. By slitting the end of the stock and inserting a cutter made from an old hacksaw blade filed to shape and then carefully scratching along the wood, the bead can be slowly formed. This technique is particularly useful should the need arise to match an existing detail.

Although good quality timber is not impossible to find these days it's not as prevalent as perhaps it was when these tools and techniques were considered cutting edge. The secret to success with making mouldings by hand is to have clean straight-grained wood to work with from the outset. Even then, inspect the line you intend to follow by looking for any deviation in grain direction that could cause problems.

These two homemade scratch stocks are perfectly serviceable and won't cost the earth to make

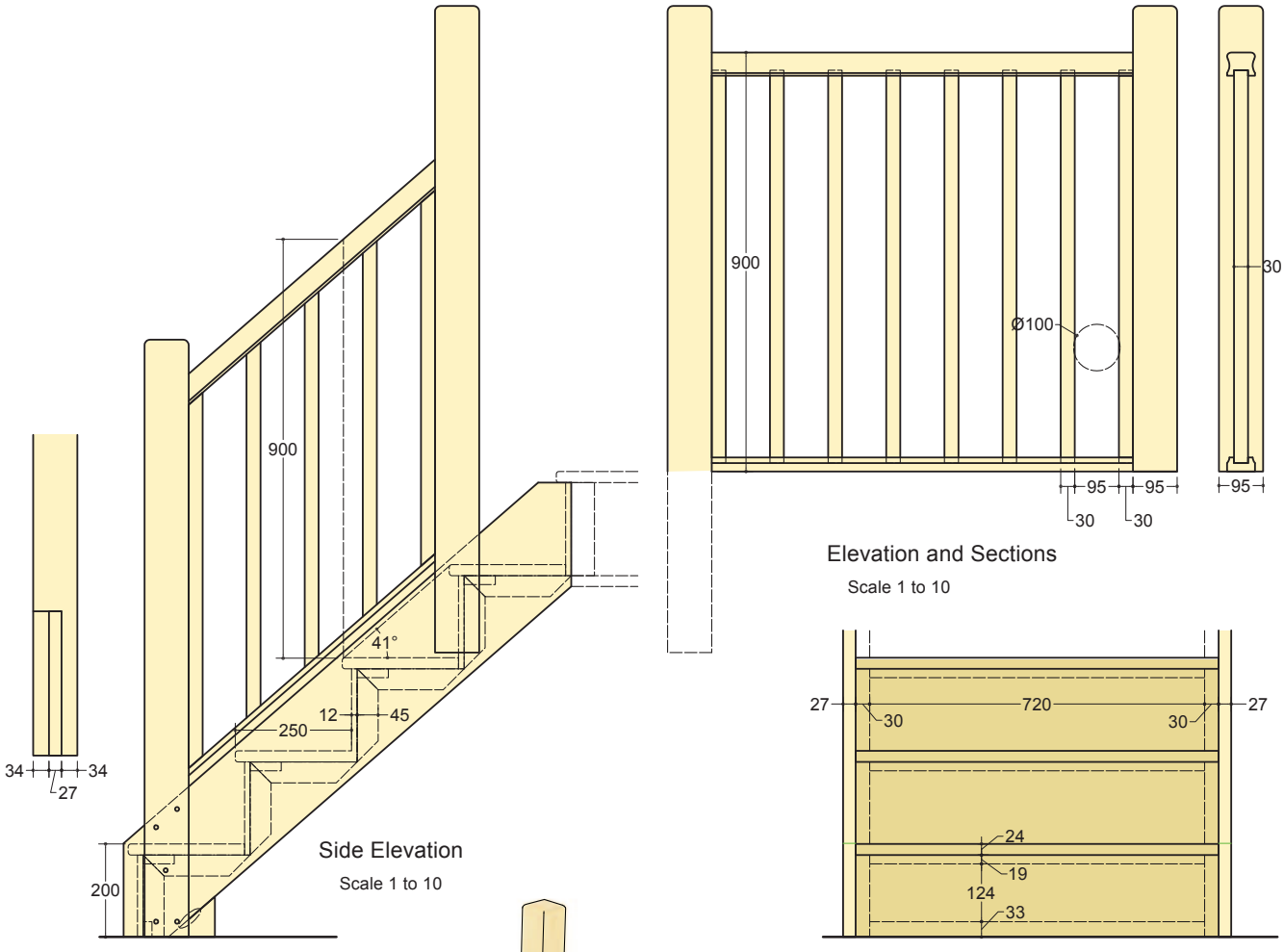
The blades are interchangeable and can be set against a choice of two fences

MAKE A STAIRCASE

Follow James Hatter's step-by-step guide to build your own stairs

This project describes the construction of a set of simple steps, with newel posts, handrail balustrade and spindles. This formed part of a kitchen extension, and was subject to Building Regulations. The information presented here should provide you with the basis to customise a set of stairs to your own requirements.

The steps and risers are made from a water-resistant grade of MDF, with pine supports and side stringers. The assembly is held together with adhesive and screws. Jointing biscuits are used for attachments to the bottom of the stringers. The handrail and base rail use commercially available pine mouldings. These include a rebate to take 30 x 30mm cross section spindles. Newel posts were formed using 95 x 95mm PAR pine stock.

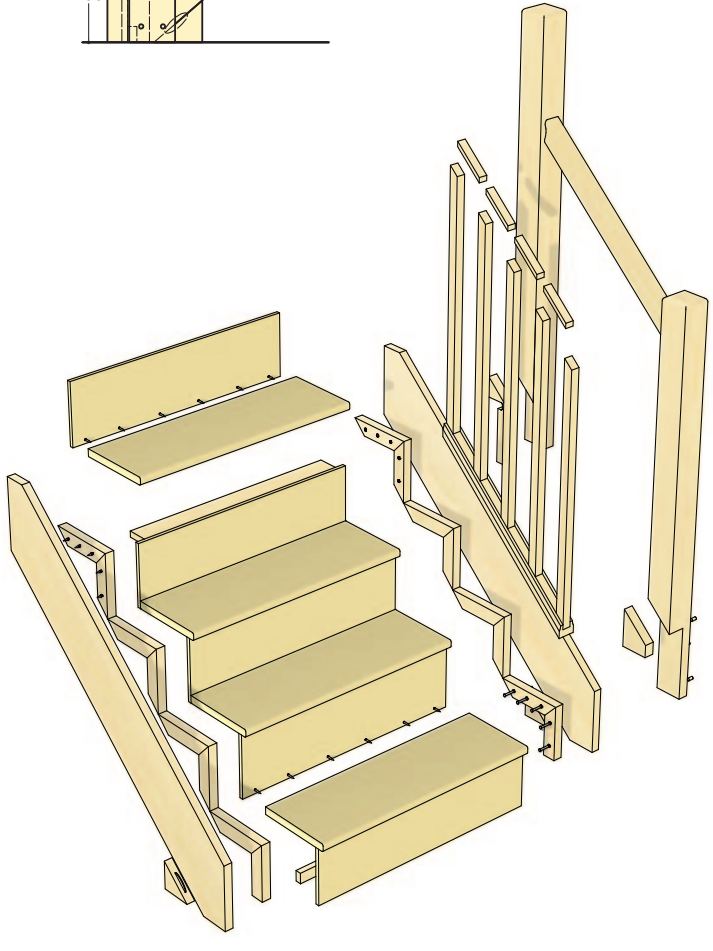


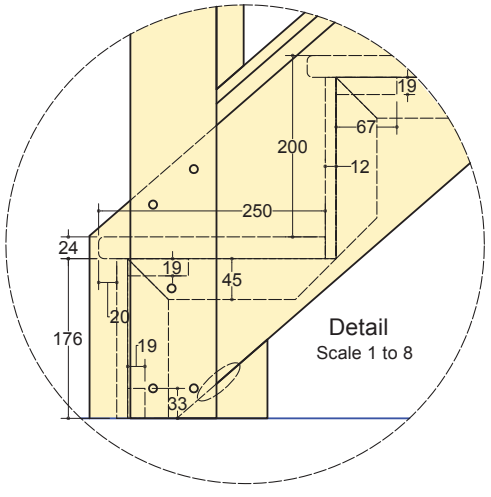
Elevation and Sections

Scale 1 to 10

Side Elevation

Scale 1 to 10





Detail

Scale 1 to 8

DESIGN CONSIDERATIONS

Accurately measure the distance between the levels you wish to include steps. Inspect the surround about the top of your level, and determine firm and secure attaching points. Take into account any obstacles. In this project I wanted to make use of the outer layer of the cavity wall that was towards the top of the level, which reduced the amount of floor space needed at the lower level. You also need to decide the stair width.

Determine the number of steps you will require, taking into account the Building Regulation requirements.

Make a scale drawing, and check angles. Then, make a stringer template using plywood, or MDF, marking all the step positions. Test fit, and when satisfied transfer all the measurements to real stringers.

You may wish to have a handrail and bannister on both sides of the steps, so the methods suggested can be repeated for both sides.

CONSTRUCTION METHODS

Once all the measurements are on the stringers, the stringer can be refined such as adding an attachment to the bottom inside of each stringer, so that it has a wider footprint at the bottom.

Cut supports for each of the steps, and further supports for the step width. In this example, all the supports and stringers used pine. The steps are made of water-resistant grade MDF, which keeps cleaner edges than standard MDF. The step consists of two layers of 12mm MDF glued and the riser uses a single piece of 12mm MDF.

The newel posts are made of 95 x 95mm pine. With commercially made stairs the stringer and handrail are usually mortised into the newel posts; however, in this example, the part where the stringer meets the post is rebated using a circular saw, so that the stringer is mid-position. The piece removed is reduced in thickness, and joined to the other side of the stringer.

The handrail, base rail and spindles, are assembled as a unit, using commercially available handrail, base rail, and spacer strips and spindles. These are placed between and attached to the newel posts.

The completed assembly can be finished as required.

Building regulations

The following provides a summary of the current Building Regulations in the UK and EU, which were adhered to in this project. Regulations for the USA can be found at: codes.iccsafe.org, by searching for section 311.7. Building codes for Australia can be found at: hia.com.au. Always check the regulations for your region.

MAXIMUM NUMBER OF STEPS:

For domestic properties the UK regulations specify that the maximum number of steps in a straight line is 16. This is not normally a problem, as a typical domestic installation usually only requires 13 steps. However, this project uses five steps, and it is suggested that a DIYer should only tackle a small number of steps, and leave a full staircase to a professional.

STEEPNESS:

The maximum angle of pitch is 42°.

STEP SIZE:

The maximum step rise is 220mm, whereas the step depth or 'going' is a minimum of 220mm – these measurements are taken from the pitch point. The step normally has a nose that projects 16–20mm in front of the pitch line. However, the ratio of sizes must not exceed the maximum angle of pitch requirement of 42° as stated. Any winders must have a minimum of 50mm at its narrowest point. The width of steps is unregulated, but in practice the winders, if applicable, are likely to limit the reduction in width.

HANDRAIL, BALUSTRADE AND SPINDLES:

The height minimum is 900mm above the pitch line, and any spindles must have a separation distance such that a 100mm sphere cannot pass through, so for plain spindles 90–98mm separation is acceptable.

Building the staircase

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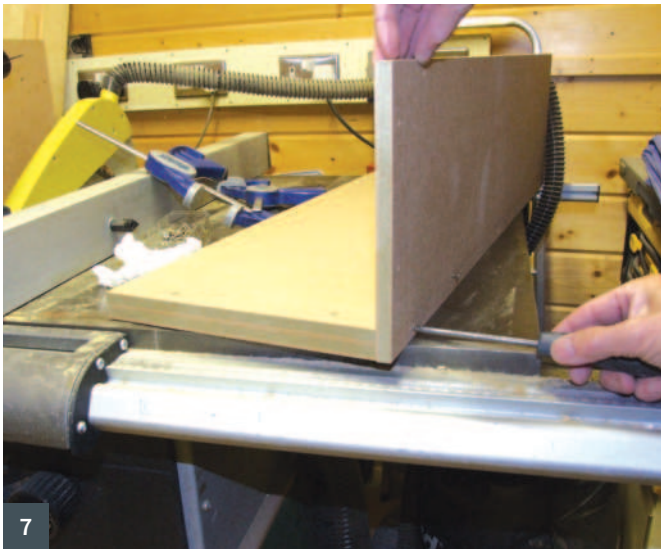
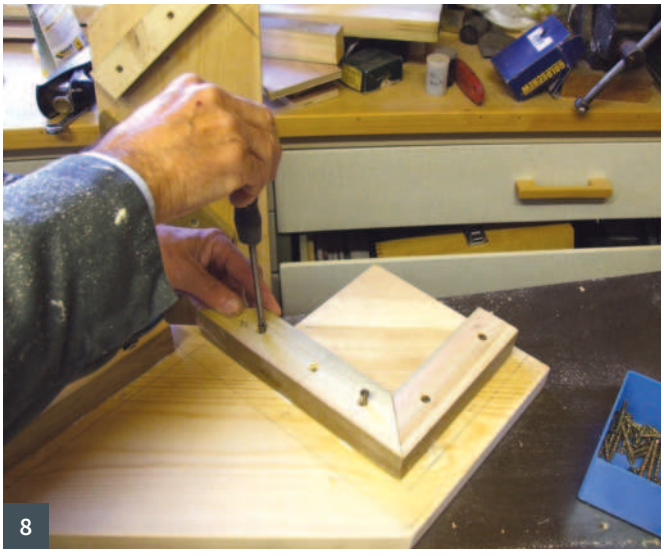
PHOTOGRAPHS BY JAMES HATTER

1 For my staircase, steps were required to give access to the extension floor below. Accurate measurements were taken, and the width, and steps decided, taking into account the required Building Regulations **2** The first step is to make a template using the measurements taken, and fit to check it meets Regulation requirements





3 From the template, the stringers can be measured and cut to size, in this example 27 x 215mm pine was used. Additionally, an attachment is biscuit jointed to the lower part to increase the footprint to the bottom part of the staircase **4** The notches are also cut to fit over the brick protrusions, if this is appropriate **5** Each step is made using two layers of 12mm MDF. These are cut to size, glue is applied and each pair is joined together **6** Screws are also used to pull the two pieces together **7** A riser of 12mm MDF is attached to each step, again using both adhesive and screws **8** Pine step and riser supporting blocks are attached to the inside of each stringer using adhesive and screws

9 Support the stringers, and start to attach the steps, then attach risers to the supporting blocks **10** An added pine support is screwed and glued at the front of each step. The front edge is spaced the nose distance (20mm) plus the MDF thickness (12mm) from the front edge of the step **11** Apply adhesive to the joining edges of the support blocks and pine support, and then locate each step into position **12** Attach with screws into the support blocks and pine support **13** Allow the adhesive to set before moving **14** This view of the rear of the steps shows the supports.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15 Place the completed stair assembly into position and fix in place using screws into the walls as appropriate. The gap to the right of the assembly will have the top newel post inserted **16** Next, measure for the newel posts to the top and bottom. Both the top and bottom posts are rebated, so that the stringer sits mid-position. Retain the piece cut for the rebate **17** Make good the inner side of the lower newel post by inserting the piece you have cut out, resizing as required **18** The top post has an insert for the same purpose, but this needs to be cut to overcome the obstructions **19** Counter-bored screws and adhesive are used to attach the post to the stringer and the attached insert. Use wood plugs to conceal the screwheads

20 The handrails, base rails and spindles are assembled as units and then attached to the newel posts **21** The bottom view of the completed stair assembly **22** Inner view of the bottom step showing the supports **23** Detail of the stair join to the right **24** View of the top balustrade **25** The completed stairs with carpet fitted

Step-by-step pyrography

Continuing his introduction to pyrography, Bob Neill makes a bread board and explains how to add colour to your work

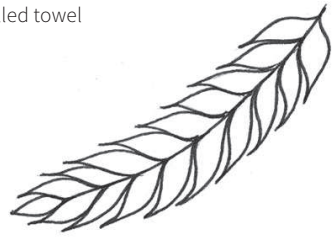
In *WWC* 62 we learned the basics of pyrography, from choosing the blanks to learning some of the effects that can be achieved, and the equipment used to do so. This time, we'll be putting what we've learned into practice, and also adding colour into the mix.

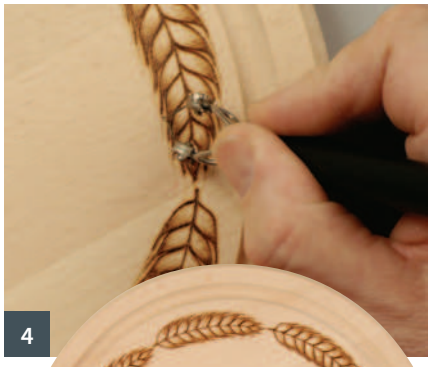
Bread board project

For this project, we'll make a bread board – a perfect example of an item that can be both useful and beautiful.

YOU WILL NEED

- Plain wooden board
- Design to fit the surface of the board
- Carbon paper
- Ballpoint pen
- Drawing tip
- Masking tape
- Rolled towel





1 Layer the carbon paper and the design and fix to the edge of the board using masking tape.

2 Remove the carbon paper. Draw the design using a ballpoint pen and press firmly.

3 Using a towel to support your arm, burn in the outline of the design.

4 Complete the shading of the ears of wheat.

5 The finished design. Coat the board with food-safe oils such as sunflower oil, Tung oil or Danish oil.

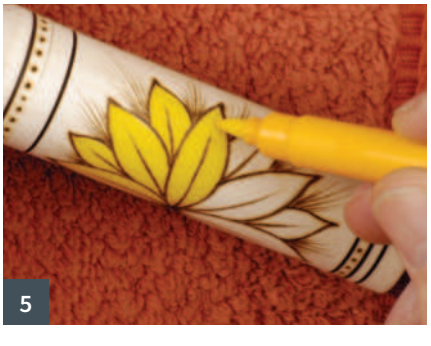
Adding colour

In order to preserve the outline of the pyrography, it is best to use water-soluble paints such as acrylics or gouache. These can be diluted with water without losing colour strength. Water-based felt pens blend well and when the paler colours are used, the various textures of the surface beneath show through the diluted colours. A variety of the effects that can be achieved are shown here.

COLOURING EQUIPMENT

Options to choose from include:

- Emulsion 'tester' bottles
- Watercolour boxes
- Coloured ink
- Good-quality brushes
- Palette for mixing colours
- 'Blob' felt pens
- Felt-tipped permanent marker pens
- Aqua felt pens
- Water-based felt pens
- Pencil crayons
- Gold and silver felt pens
- Metallic acrylic paint
- Acrylic paint



PHOTOGRAPHS BY GMC PUBLICATIONS/ANTHONY BAILEY

1 Water-based crayons
2 Felt-tipped pens
3 Permanent felt pens
4 Acrylic paints
5-7 Water-based felt pens can be used to build up layers of colour

SKETCHBOOKS

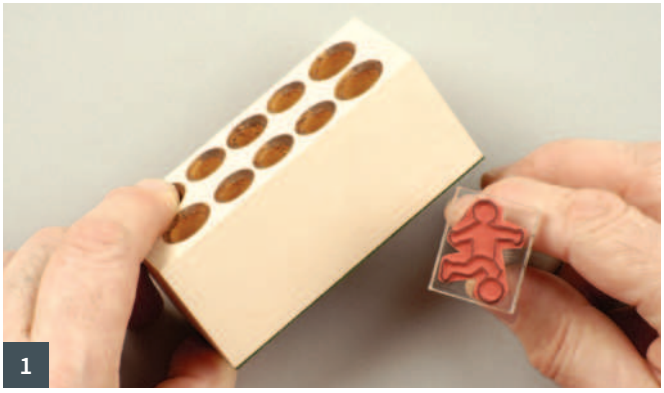
Many artists carry a sketchbook with them at all times and ideas can later be developed from any quick sketches. Ideas can come from observing man-made or natural objects. Look out for interesting shapes, textures, colour or patterns. A sketchbook is like a visual diary; it is a resource that you can keep adding to and is always a source of inspiration.

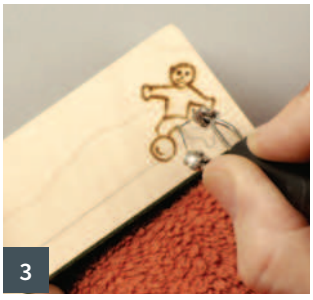
Pencil block project

Children love these useful pencil blocks, and anything that helps youngsters to be tidy is always handy!

YOU WILL NEED

- Pencil block blank
- Rubber stamp
- Ink pad
- Pencil
- Drawing tip
- Rolled towel
- Permanent marker pens





1 Choose a rubber stamp of a suitable motif.
2 Stamp the motif on the blank, making sure it is correctly placed.
3 Using the towel for support, burn the outline of the motif.
4 Draw in the background images (in this case a goal and football pitch) freehand, using a sharp pencil.
5 Complete the outline.
6 Colour in the design if desired using permanent marker pens.

Finishing your work

If left bare, the finished piece can pick up marks and get dirty. For pieces that are to be displayed outdoors, such as house numbers or house name plaques, you need to protect them with yacht varnish. A clear matt or satin varnish can be used for boxes that will be handled regularly. Beeswax is frequently used on finished items, or Danish oil which can be brushed or wiped on and successfully brings out the grain of the wood.

1 Start by sanding off any rough edges.
2 Spray with acrylic gloss varnish.
3 Wax using a soft cloth.

CANOPIES OF WONDER

Whether they're a mass of dense foliage leaning over a country lane or colourful, fragrant-rich blossoms shading a city street, tree tunnels rarely fail to elicit a smile and encourage contemplation

Nature serves up endless wonders, some are monumental and millions flock to their path, others are quiet, often going unnoticed to all bar the birds and the bees. We might often drive through or walk under one daily. Yet a humble tree tunnel can be as awe-inspiring as the Grand Canyon and as romantic as the Taj Mahal. Formed from a parallel line of trees on each side of a path, lane, track or road, a green avenue features in landscapes across the world. As the specimens mature, their uppermost branches often mingle and entwine to produce a dense canopy of foliage, creating a visually stunning enclosure, arch or tunnel.

These magical formations, which sometimes appear to have grown wild from seed, are often the result of the human activity that runs along and over country tracks, lanes and holloways, particularly where there is significant footfall. Travel through a narrow country lane in parts of the UK or mainland Europe and the chances are you'll soon find yourself beneath a billowing ceiling of green.

Many avenues (derived from Old French *avenir*, meaning to arrive or reach) are planned – planted and cultivated as a formal feature in rural and urban areas. Influenced by continental and classical design, intentional planting of tree-lined boulevards took root in many places around the 16th century. They often feature ornamentally in parkland and botanical gardens, such as the Gardens of Versailles in France and Hampton Court Palace in England, and at the entrances to fine mansions and estates. Impressive in any season, they soon became increasingly popular. Some avenues are a status symbol, drawing the eye to a grand house or architectural characteristic, whereas others are planted to mark special occasions or provide a tranquil and dreamy place to walk.

In Japan, picturesque cherry blossom and wisteria tree tunnels are a feature of many cities, parks and shrines. Sakuramori (tree specialists) take care of the specimens throughout the year. Some of the country's best-known arrangements focus around cherry blossom, with spring festivals captivating locals and tourists alike. At night, these tree tunnels are lit up with lanterns, producing breathtaking spectacles of colour.

Blossom isn't the only option, though. Tree tunnels come in many colours and styles including beech, oak, ginkgo, elm, cypress, lime, maple and even bamboo. In the wilds of nature, a canopy might be formed of different specimens and shrubs whereas formal avenues tend to have only one, chosen for aesthetic effect or to offer a feast for the senses.

WONDER AND ENCHANTMENT

From the earliest times, trees have been worshipped and revered and the feeling of being enclosed by nature's most living pillars speaks to the imagination. Many older green tunnels, with gnarled and twisted roots and branches, have a fairy-tale feel about them. As you enter a winding avenue, such as Dark Hedges in Country Antrim in Northern Ireland, you can't help but wonder what you're going to find at the other end.

Apart from being attractive and evocative, these green passageways have long provided inspiration for art and literature. There's a mention of fairy-tale tree avenues in Edmund Spenser's *The Faerie Queene*, published in 1596: 'And all without were walkes and alleyes dight, With divers trees, enrang'd in even rankes.'

The paintings of British artists David Hockney and Nick Schlee also feature tree tunnels and the wooded pathways appear in folklore too. To the Celts, walking through an avenue of elm offered a passage to the Underworld, while avenues of Linden trees are considered sacred in some parts of Eastern Europe. These refreshing leafy corridors are filled with soft dappled light on brighter days but can take on a more sinister atmosphere when it's dark, gloomy or foggy. With so many magical associations and stories about trees, it's not unusual to experience a spooky sense of foreboding or a healthy respect when travelling through a mysterious tunnel of trees – especially at night.

Visiting an avenue of trees at any time of year can be a real treat for the mind and senses. Walk down a luscious boulevard on a summer's day and watch the sunlight find its way through gaps in the canopy to create dappled patterns on the ground. In autumn, stroll through red and golden leaves and enjoy early-morning mist that makes the tunnel's end seem like it's slipping into another dimension. Notice the stark tangle of winter branches or enjoy snow-covered evergreens. In springtime, saunter beneath an aromatic cloud of pink or white blossom. Breathe in the fresh aroma and feel instantly revitalised.

From the elegant plane whose graceful branches arch over London's crowded streets to the magnificent fig that lines the avenues of Sydney's Hyde Park, these living sentinels are enchanting, but they are also transient. Each sapling grows, matures and eventually dies, though many will outlive the current generations of people with whom they share the planet. It's a reminder to enjoy what's here now. To walk, cycle, drive or even trot on horseback through a green passageway is a privilege. Allow yourself to be enchanted, stand in awe and be grateful for nature's generosity. It's nothing short of magical.

Words: Carol Anne Strange

‘IT’S NATURE’S MEDICINE’

The road ahead is long, as has been my day. My mind racing with thoughts queuing up to be processed, I pull over and get out of the car. I need time out, a 10-minute break to recharge my body, cleanse my senses and clear my brain. The fresh air hits my face and in an instant I see I’m in a tunnel. But not one that’s fashioned out of brick or stone. This is one of birch trees. Slender silver trunks with black grazes line my left and right. It stops my thoughts in their tracks and I observe the silver in its most natural form.

Above black branches are entwined and teardrop-shaped leaves feather together in loose layers creating a soft canopy. As I look ahead, the green tunnel extends before me. The wind whips and flicks through the leaves, the canopy gently parting to let natural light spill on to the road.

My shoulders lighten, my breath rhythmically moves to a human pattern of inhale and exhale. My senses switch on, my mind clears and I recall something I was told as a child: ‘The birch is a native here, as is the cherry, ash, oak and maple and they’ve been occurring naturally since the Ice Age.’ I remember feeling fascinated by this fact, and today in this tunnel of birch trees, the fascination is still there.

The experience gets me thinking about the countryside – its textures and colours – and how they reflect the seasons. I decide from here on I will make a conscious effort to stop, to pay attention and to notice changes in the natural world. It will take practice. The mind is often too busy to notice ‘simple’ forms of beauty – those that trundle on in the background – but they’re nature’s medicine for the harassed human mind. And nature’s medicine is there for anyone who notices it.

My impromptu 10-minute break has done more than make me sit up and notice, however. It’s struck a deeper chord. My love of trees has always been there. It’s just resurfaced. And today, in this green tunnel, it made me feel more connected to the bigger world than ever.

Words: Clare Bullock

GREEN CEILING

Foreboding, romantic, magical – take cover in some of the world's most delightful natural spaces

1 CYPRESS TUNNEL

California, US

Located about halfway between the lighthouse and the visitor centre on the Point Reyes Peninsula and lying just north of San Francisco is a resplendent avenue of Monterey cypress. These evergreens were planted around 1930 to celebrate the maritime radio receiving station and equipment commissioned for the area by Guglielmo Marconi shortly before World War I. A good time to visit is at sunset when the light fills the space with rich, warm colours.

nps.gov

2 TUNNEL OF LOVE

Klevan, Ukraine

This romantic canopy, part of a stretch of industrial railtrack, is popular among couples and newly weds. Locals say the green arches, which are shaped by the passing trains, are beautiful throughout the year, but they are especially dramatic in winter after heavy snowfall.

ukraine-kiev-tour.com

3 THE DARK HEDGES

County Antrim, Northern Ireland

(*Above*) Featured in TV fantasy *Game of Thrones*, this avenue of majestic aged beech trees on a narrow country lane are about 80km north of Belfast. Planted by the Stuart family in the 18th century, this enchanting tunnel leads to the Georgian estate of Gracehill House. Watch out for the Grey Lady who's said to haunt the walkway at dusk.

discovernorthernireland.com

4 JACARANDAS WALK

Johannesburg, South Africa

Take a stroll through the country's largest city and you'll find yourself beneath canopies of thousands of Jacaranda. Home to what's thought to be the world's largest man-made forest, the best time to visit is October when the blossom is at its highest, its fragrance filling the air and its petals providing a purple-blue ceiling.
joburg.co.za

5 OAK ALLEY PLANTATION

Louisiana, US

On the west bank of the Mississippi River in Vacherie is a canopied path of oaks planted in the early 18th century on this historic plantation estate. Running between the manor house and the river, you can take a tour of the grounds as well as enjoy a calming walk through this 245m-long avenue.
oakalleyplantation.com

6 BAMBOO PATH

Kyoto, Japan

(*Above*) Located in historic Arashiyama, designated a place of scenic beauty by the government, the path is a relaxing and awe-inspiring walkway through the city's green bamboo forest. Sturdy, stalwart and a Japanese symbol of prosperity, bamboo is found close to many famous shrines, including the Adashino Nenbutsu-ji Temple. Walk slowly and enjoy the iconic sound the wind makes as it blows through these tall shoots.
insidekyoto.com/arashiyama

7 CHERRY BLOSSOM AVENUE

Bonn, Germany

(*Left*) Once the country's temporary capital, this relaxed city has several tunnelled streets offering a canopy of fragrant pink flowers for two to three weeks in the spring. Planted in the 1980s, the fairy-tale spectacle of these Japanese specimens in full bloom attracts thousands of visitors each year.
bonn.de

8 HALNAKER TUNNEL OF TREES

West Sussex, England

(*Below*) Hidden within the South Downs National Park, this spectacular canopy on a sunken track is reminiscent of *Lord of the Rings*. It includes varieties of wizened oak, hazel, field maple and black bryony. Leading up to the Halnaker Windmill, a gentle meander here at any time of year offers space for quiet reflection and fuel for the imagination.
southdowns.gov.uk

9 TREE TUNNEL

Drenthe, the Netherlands

One of the greenest provinces in the country, Drenthe has 1,400km of forest pathways and more than 50 prehistoric tombs. It also has a cathedral-like tunnel of rare beauty, its trees stretching up to the sky in breathtaking fashion. The track is perfect for cyclists.
holland.com

10 RUA GONÇALO DE CARVALHO

Porto Alegre, Brazil

This busy street has an abundant canopy offering shade and vital greenery at the heart of busy Porto Alegre. There are more than 100 Tupuana (Rosewood), natives to South America, lining each side of the street. Said to have been planted in the 1930s by German officials working in a brewery nearby, they now tower over some of the apartment buildings.
visitbrasil.com

Words: Carol Anne Strange

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SAIL AWAY

We meet the team preserving traditional woodworking skills at the Boat Building Academy

If you've ever dreamed about taking your woodworking craft in a new direction, perhaps a course at the Boat Building Academy could be the thing for you. Based in Lyme Regis, Dorset, the Academy was founded in 1997 by Royal Navy veteran and Yacht Master examiner, Commander Tim Gedge. It provides full-time, highly practical skills training with the emphasis on 'hands-on' learning.

Preserving an industry

Commander Gedge was inspired to set up the Academy after witnessing the sad decline of the British boat-building industry. The trade had disappeared in many areas and where it did survive, boats were often mass produced. The traditional skills still lived on with the older, experienced tradesmen but there was a real danger of these skills dying out. The end of traditional apprenticeships meant they were not being passed on to the next generation.

'My aim in setting up the Boat Building Academy was to provide training for men and women of all ages that would carry forward the best traditions of British boat building and enable each of them to develop his or her potential using the best modern techniques in boat construction. I am particularly proud of the excellent standard that our students achieve and of the success that so many have made in their careers in the marine industry', explains the Commander.

The Academy's courses are intensive and highly practical, with most of the students' time spent in hands-on activity in the workshop, with instruction from the team of highly experienced instructors. Academy students do not work on commercial projects: people learn a wider, deeper range of skills without the conflicts of interest that arise from the requirements of commercial work. A wider range of boats are built than are found in most boatyards, enabling students to gain practical experience of many different construction methods and techniques.

Boat-building courses

The Academy's flagship course is its 40-week Boat Building, Maintenance and Support course, which teaches traditional and modern wooden boat-making skills; fibre plastic boat building; yacht joinery; spar and oar making; finishing and coatings; rigging, chandlery and cordage making; and sail making and repair. The course incorporates a City & Guilds Level 3 Diploma in Marine Construction, Systems Engineering and Maintenance, and many students use it as a way into the marine industry, while for others it is a challenging retirement project, or just a chance to learn new skills.

The students work together to build boats as a group, and you can see a selection of the vessels on the Academy's website. At the end of each course, the students' boats are walked in procession down to the sea and launched with due ceremony in Lyme Regis harbour.

Shorter courses are also available focusing on specific skills such as sail making, ropework, repairs and renovation, and modern and traditional boat-building techniques.

PHOTOGRAPHS COURTESY OF THE BOAT BUILDING ACADEMY

Furniture-making courses

In addition to boat building, the Academy also offers two 12-week courses on furniture making: Furniture Making with a Level 3 Boat Building Academy Diploma and Advanced Furniture Making. Students learn hand skills and power tool use; make tables, cabinets and boxes, before designing and making a personal project piece that uses all the techniques they're learned. As with the boats, an archive of students' furniture projects can be seen on the website

There are also short courses for furniture making, covering skills such as antique furniture restoration, bench making and marquetry.

All of the furniture-making courses are supervised by experienced designer-maker Mark Ripley. Mark is a member of the Society of Designer Craftsmen and the Hampshire and Berkshire Guild of Craftsmen, and his work has been widely exhibited and published.

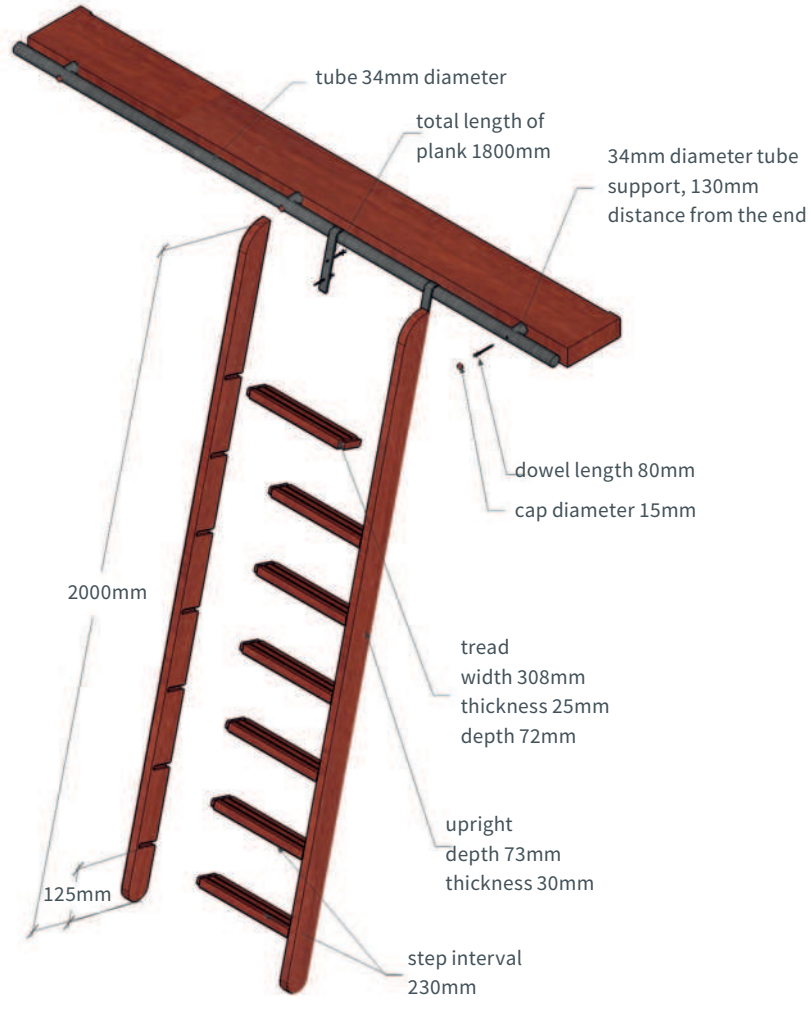
After a brief hiatus during the lockdown, courses are now back up and running with safeguarding measures in place. For more details, see the Boat Building Academy website.

boatbuildingacademy.com

LIBRARY STEPLADDER

Francesco Cremonini and Giacomo Malaspina make a stepladder for a wall-mounted bookcase

In issue 61 we built a wall-mounted library bookcase but it needed a stepladder to reach the books. You could make these steps for any other suitable bookcase or large wall-mounted cabinet if it is strong enough to support the stepladder.



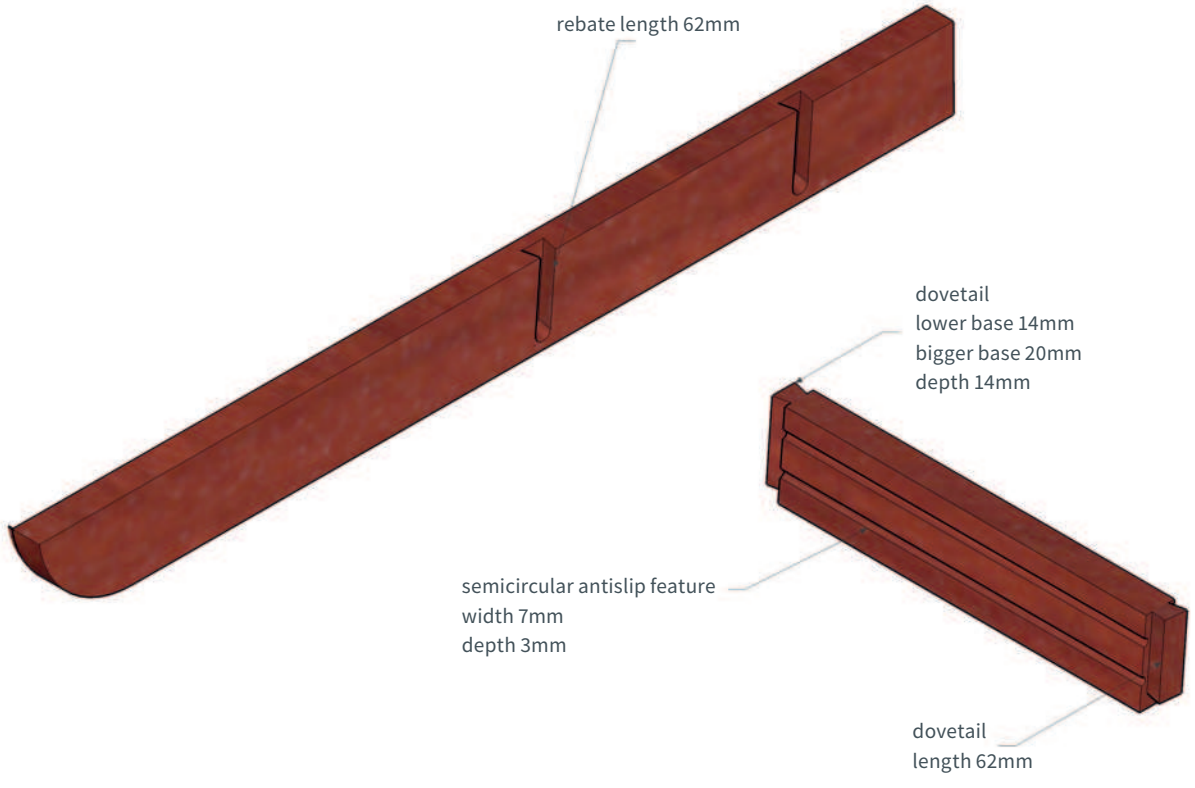
QUICK, EASY MEASUREMENT

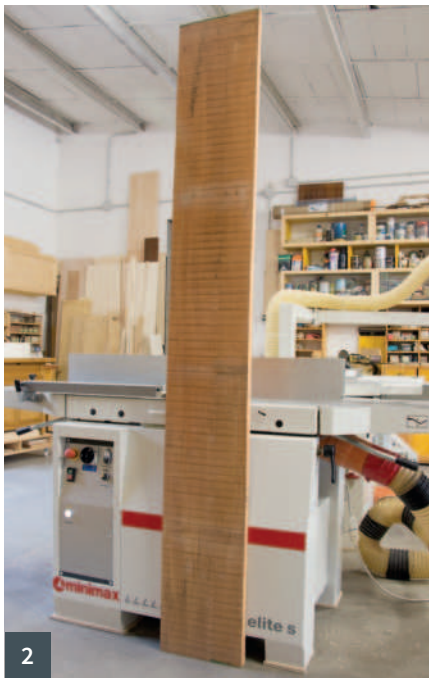
It is possible to use Pythagorus' theorem to work out the correct inclination for the stepladder as we have done, but in fact just using a piece of string will give the correct length, but you do need to ensure the steps will be level when the stepladder is in position. The best way to do this is to draw out a 'rod' or template to make sure this is correct.

MATERIALS AND INITIAL PROCESSES

The choice of material is critical for this project. For this type of work a robust but not very heavy wood is needed, possibly with the same texture as one used for furniture. It needs to be well seasoned and straight, with knot-free grain to prevent breakage.

The uprights were machined at 30 x 72mm and the steps 25 x 80mm, seven steps being required for the height of the stepladder. The difference in depth derives from the fact that the steps are inclined with respect to the uprights. The staircase in this case forms an angle with the ground of 80° and the same inclination must be allowed for on the steps so that once they are in place they are horizontal.





PHOTOGRAPHS BY FRANCESCO CREMONINI AND GIACOMO MALASPINA

1 How long is a piece of string? Measuring the length at the correct angle needed for safe use **2** A nice, long straight-grained board for the sides and the steps **3** Checking the timber for any defects after cutting **4** The timber for the steps was not quite wide enough but gluing up two strips did the job **5** Setting out the step angle using a sliding bevel and a piece of card the same thickness as a step

ASSEMBLY

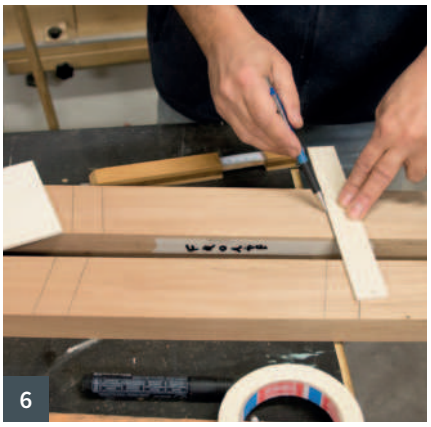
The chosen joint between the sides and the steps is the blind dovetail housing. The uprights were marked for the placement of the steps at the correct angle. In general, library ladders start with a very low bottom step that gives stability while at the top the uprights continue for a longer stretch beyond the last step. During use, the tips of the uprights can be held on to with at least one hand. The housings were machined with jigs specific to left- and right-hand side rails. The dovetails were machined on the router table to match the housings.

METAL COMPONENTS

There are two elements that allow the ladder to be fixed to the hanging bookcase: the round bar and ladder hooks. The first is tubular and screwed in three points on the front base of the bookcase. It was made up specially by a blacksmith starting with 25mm gas pipe (external diameter 34mm). The tube was then sandblasted to eliminate galvanising and then painted with dark walnut-brown aniline dye and shellac. The same finish as the bookcase was used as a protective coating. The hooks, to be mounted on the top of the ladder, were made with a 3mm-thick steel. For shaping we used a wooden template with a slightly larger radius than the tubular rail. This left space for scratch-resistant felt pads inside the hooks as a protection for the tube coating.

FINISHING

Abrasives were used to finish all surfaces, finishing with 320 grit. Brown aniline dye followed by a shellac finish were used to give the stepladder a traditional appearance. Application was by brush on the step treads and by roller to give an overall even finish.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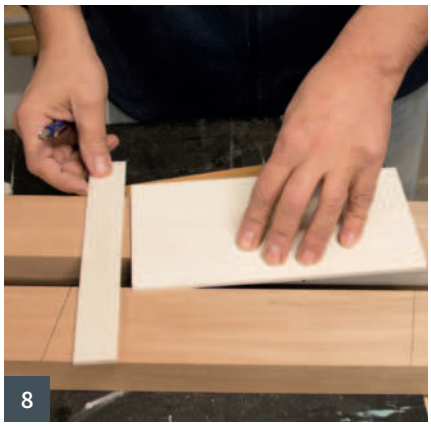
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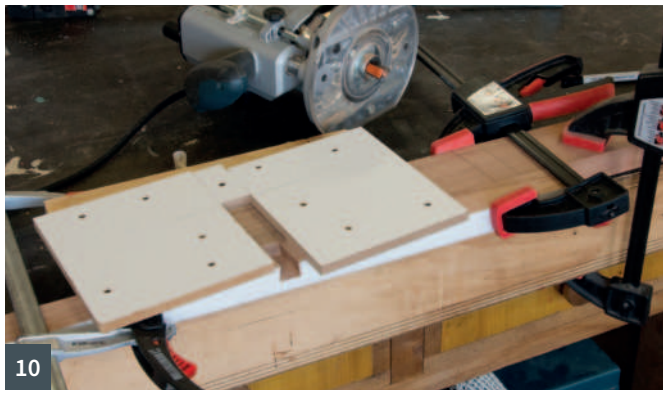
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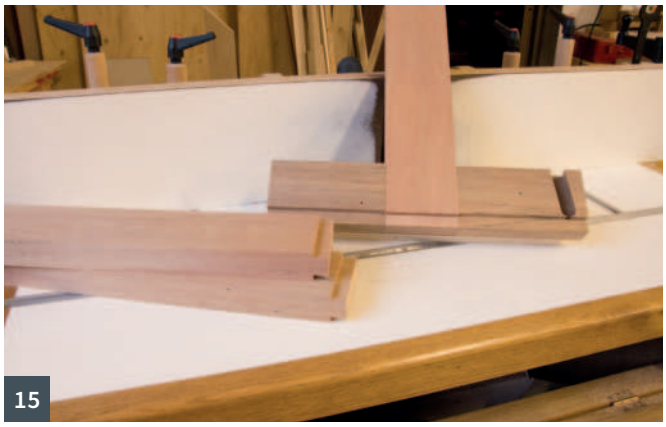
6 Marking the other side at the opposite angle **7** Using a card template to accurately set out each step position **8** Placing the card strip for the next step **9** Checking the angles are still correct all the way up the ladder sides **10** A special jig for routing the stopped housings **11** A machined housing using a dovetail cutter and guide bush **12** The temporary extraction keeps the housing from getting clogged **13** The housings have been made slightly wider than the cutter diameter **14** The step machining jig holds components firmly upright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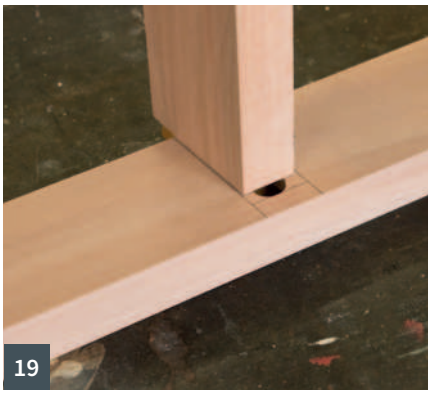
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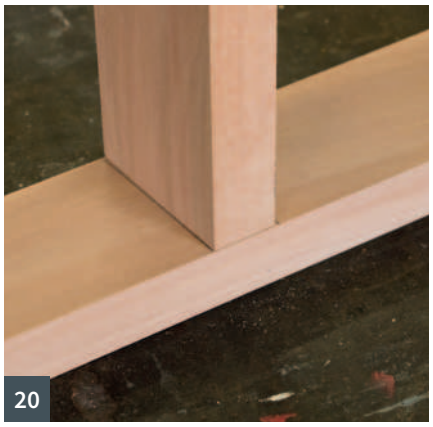
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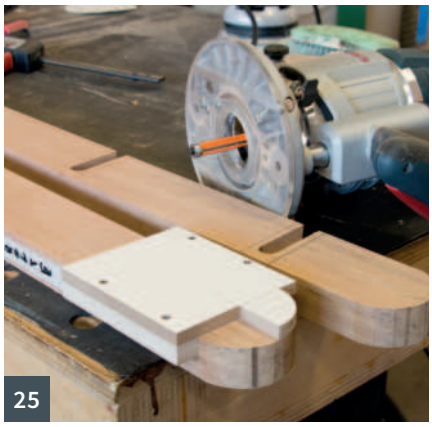
15 A component sitting in the middle of the jig when creating the dovetail tenon **16** Removing the first part of the tenon to fit the blind housing **17** Marking the line for the angled tread edge **18** Sawing the second pass on a step tread to match the angled stepladder sides **19** The front end of the sliding dovetail tenon is chiselled to fit the round-ended housing **20** A nice neat fit flush at the front edge **21** At the back edge the fit looks good too **22** Using a steel rule and homemade sliding stock to set out tread positions **23** A core box cutter set up for machining each tread **24** Note how the coves are set in third-and-third positions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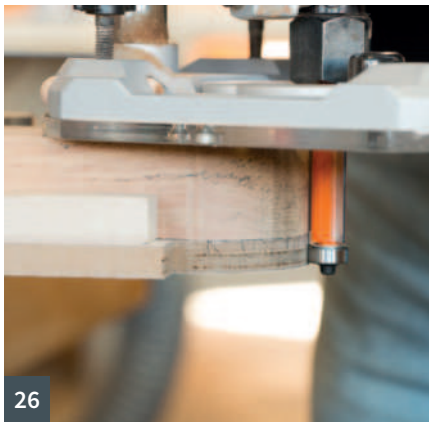
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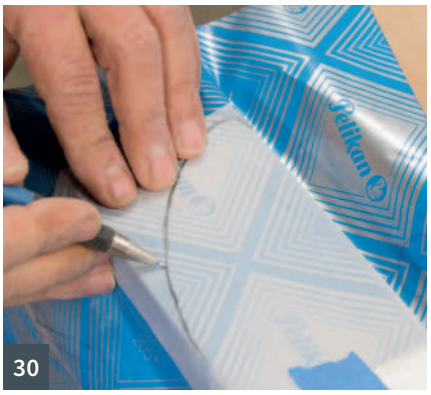
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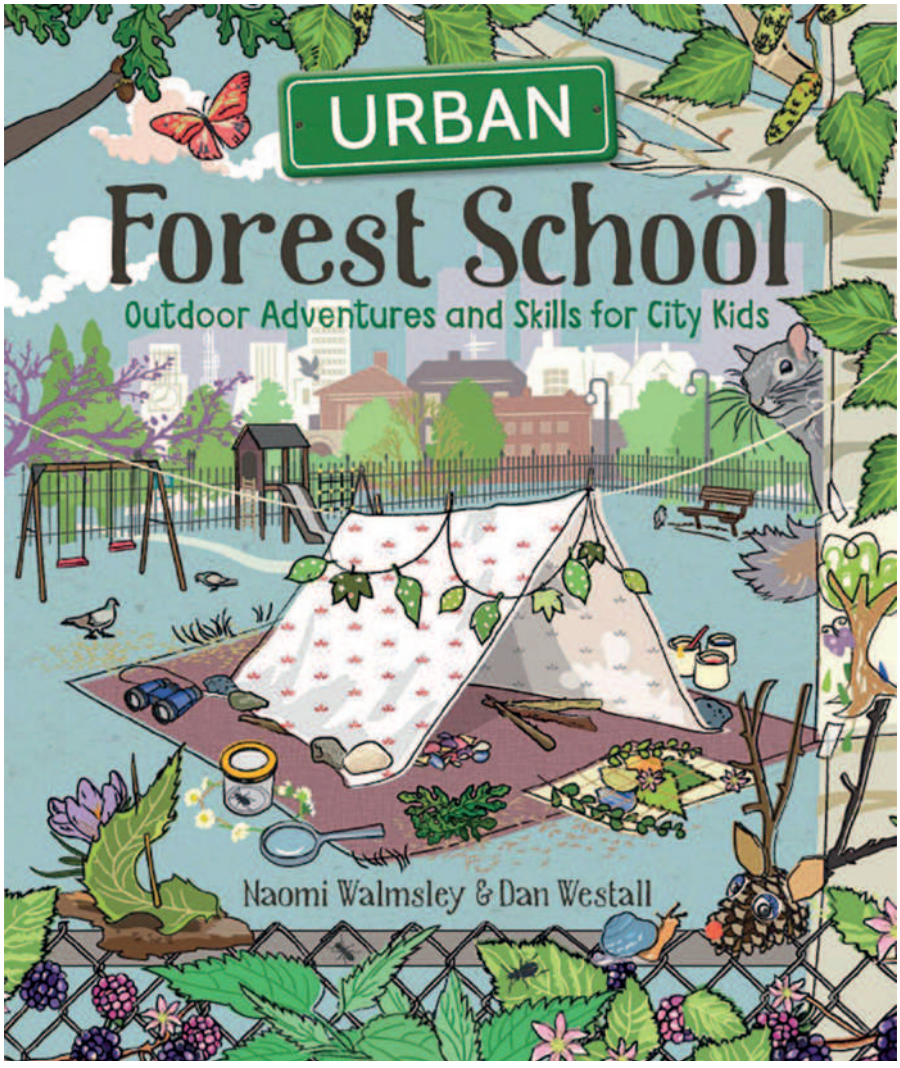
25 The top of the ladder sides are machined using a jig – shown inverted here **26** Note how the cutter overruns on to the jig enough to ensure the component is machined fully **27** Fully rounded over for comfort when ascending the stepladder **28** The bottom end is shaped to rest nicely on the floor **29** The shape is copied on tracing paper to transfer to the other component **30** Now for carbon paper to leave a pattern behind **31** Both are marked out, waste areas are hatched and router jig shaped to match **32** A neat finish created using a four-cutter bottom-guided router bit **33** All the components are coated before assembly for a better, more even finish **34** A brown aniline dye gives a darker more traditional appearance **35** A clear shellac coat applied by narrow roller, note how a bit of dye gets picked up

36 Applying PVA adhesive to all the housings ready for assembly **37** The bookcase sliding rail is coated with aniline dye **38** Once the shellac top coat is applied the rail looks like this **39** Bending steel bar to make the rail hook-overs **40** The steel hook-overs are slightly bigger diameter than the rail **41** Everything ready to install, note the tread pattern repeats underneath the steps

URBAN FOREST SCHOOL

The new book from Naomi Walmsley and Dan Westall will inspire children with a love of nature and a sense of adventure



Many children nowadays are disconnected from the natural world and favour technology over traditional crafts. *Urban Forest School* aims to change that by giving kids the chance to develop their creativity, confidence and resilience. Crucially, the book emphasises that children can access nature even if they live in a city or town, there is no need to have a woodland, park or garden – nature can be found anywhere if you just look hard enough!

The book's authors, Naomi Walmsley and Dan Westall, run Outback2Basics, a company based in rural Shropshire that teaches bushcraft skills to children, and they have brought this knowledge and enthusiasm to *Urban Forest School*.

The activities and projects are suitable for children of all ages, and for adults too, of course! A love of wildlife could be inspired by making bird feeders and honey bee water stations, there are also guides to identifying trees, plants and urban animals. Other activities focus on adventures such as camping, night walks and wildlife tracking. There are plenty of fun games to play too, such as building an outdoor theatre and making your own nature-themed board game. There are creative arts and crafts projects and even some delicious recipes, all using nature's bounty – stinging nettle crisps, anyone?!

The book also includes a section on climate change, which explains the concept to children and suggests ways that we can all help to protect our planet. A sense of responsibility and respect for the environment is encouraged throughout the book.

Whether it's knot tying, den making or leaf printing, there's bound to be something in *Urban Forest School* to entertain your family.

Urban Forest School is published by GMC Publications, priced at £11.99

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Woodworking inspiration

Time for that all-important tea break and a chance to reflect on what inspires your craft

Perhaps you have been woodworking for a while and reached a relatively competent standard, you've learnt some wood-preparing and joint-making techniques, but have you run dry on ideas of what to make? This can happen with any hobby; I remember learning to fly and once I had got my licence and flown to all my local airfields I realised the challenge for me was the actual learning. I then figured a way to retain my interest and took up different kinds of flying, such as gliding, to make sure I kept learning, the result of this was then going to new places. This analogy is a bit like woodworking as there is always something new to learn, whether it be new joints, new woods or how to use new tools. The motivation for learning is where it will take you, or in other words what you are going to make. So, which comes first, the learning or the making? The answer is both, sometimes what you want to make will inspire your learning and other times it will be the reverse of that. Look everywhere for inspiration for making things, even something bizarre – someone I know used bridges for inspiration for making tables. In these difficult times, thankfully, instead of going out you can trawl the websites of home stores, museums, famous houses or woodworking sites. There will be something there to inspire you, and

PHOTOGRAPH BY SHUTTERSTOCK

while you are on the internet you can find information on woodworking techniques, too. One of the best sources of inspiration and information is just where you are reading this… in magazines. There are also books and websites such as our Woodworkers Institute where you can find a mine of information. We would love to know what inspires your woodworking so please let us know.

WORDSEARCH

Balustrade
Burl
Burnisher
Cabinet
Collet
Epoxy
Grain
Laminate
Mortise
Mullion
Splitter
Tenon
Wane
Wax

N	E	E	Y	G	T	E	U	L	I	L	L	A	N
N	I	P	E	D	A	R	T	S	U	L	A	B	A
I	N	L	P	E	L	A	Y	A	E	L	R	I	E
A	E	L	R	U	B	A	X	A	N	S	A	E	O
P	I	U	E	Y	L	N	O	H	X	I	R	W	X
R	N	E	C	E	L	E	P	S	R	A	M	X	A
C	A	B	I	N	E	T	E	I	N	E	L	A	W
O	S	M	U	N	O	I	L	L	U	M	E	L	L
L	A	A	L	O	N	T	E	B	G	C	B	U	T
S	S	P	L	R	E	H	S	I	N	R	U	B	L
H	I	E	N	L	A	T	E	N	O	N	A	E	E
N	A	A	S	P	L	I	T	T	E	R	A	I	X
E	W	A	N	E	A	E	S	I	T	R	O	M	N
C	C	O	L	L	E	T	L	O	G	E	R	L	H

SUDOKU

Sudoku is a great activity to sharpen the mind. The object of Sudoku is to fill in the empty spaces of a 9x9 grid with numbers 1-9 in such a manner that every row, every column and every 3x3 box contains all numbers 1 through 9.

	4					5		
		9			2			
			3	5	4	7	8	9
1	9		4					
6	8	2				1	9	4
					1		2	7
9	1	8	5	6	7			
			1			9		
		5					6	

CELTIC COASTERS

Glenda Bennett uses contrasting veneers to make traditional knotwork and spiral motifs

This set of six coasters is made up of knotwork and spiral designs, with no carving involved. I have used contrasting veneers to give life to the designs, which are then set into a recessed base. I have also included a wooden holder to store the coasters.

The method I used to make the coasters and holder is specifically designed to show that, if care is taken, round objects can be made without using a lathe, which would be the more obvious choice of power tool for this project. I have used power tools such as a scrollsaw and router, which not everyone will have access to, but all the steps could be worked using hand tools.

If you do have a lathe, use the usual turning methods to produce the bases and holder, then make the veneered patterns as shown.

Using two contrasting veneers for each design will produce two versions of the same design reversed. This means that a set of six coasters can be made using just three of the designs, or two sets of coasters could be made with six differing designs in each set, and each set contrasting with the other. The patterns chosen for the coasters have been kept simple, to reduce the number of cuts needed, to cater for those who have not used veneers before. When the technique has been practised and mastered on these simplified designs, you could go on to make your own designs using more complicated patterns.

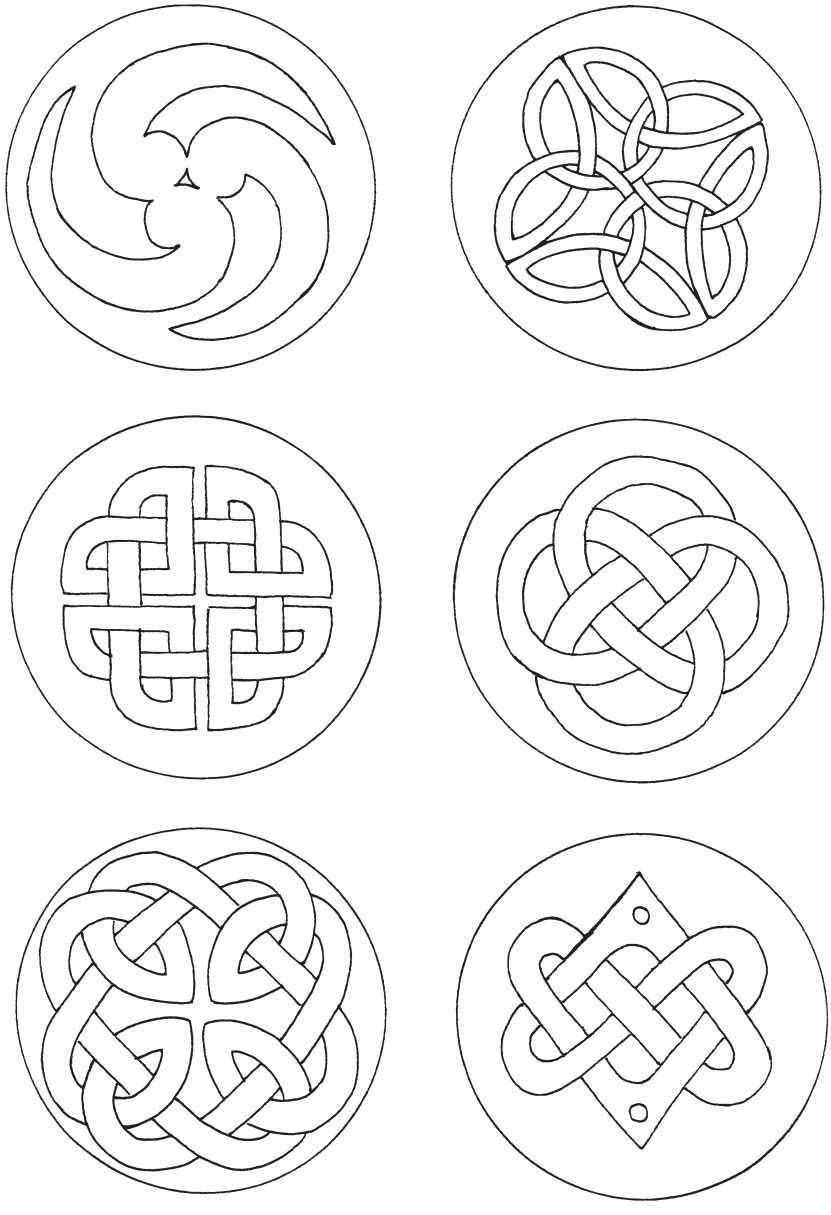
YOU WILL NEED

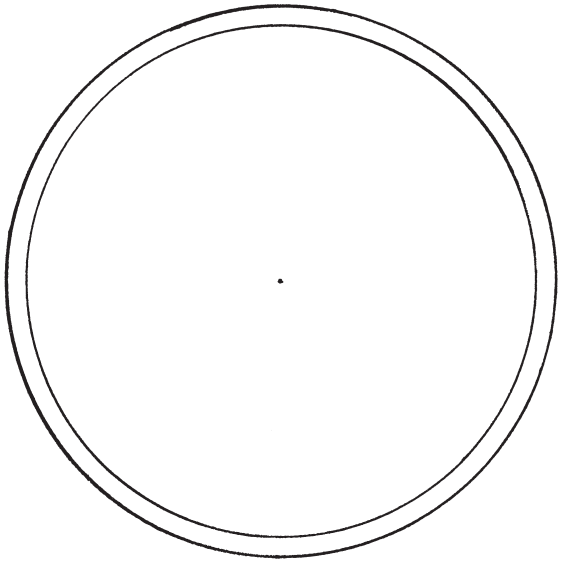
Materials:

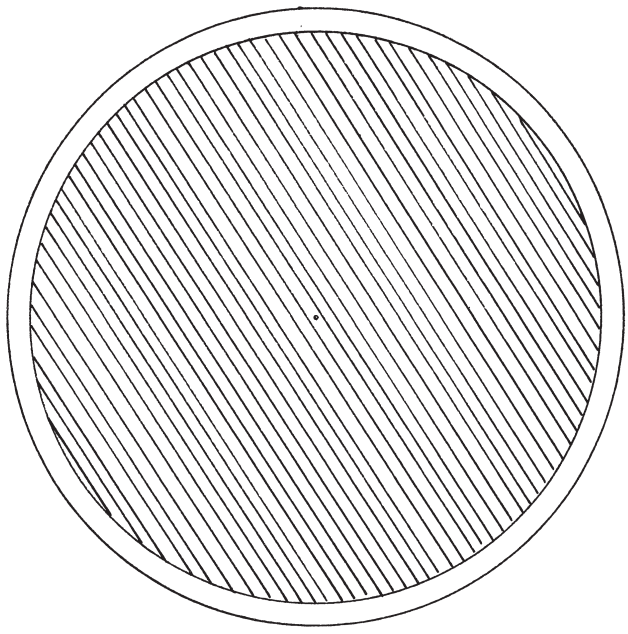
- Photocopies of templates and designs as required, enlarged by 125%
- Piece of timber approx. 630 x 100 x 6mm for coaster bases (American tulipwood)
- Piece of timber approx. 110 x 110 x 50mm for holder (beech)
- Contrasting veneers, at least 100 x 100mm, two per design
- Wood glue
- Repositionable spray adhesive
- Fine garnet sandpaper
- White spirit and lint-free cloth
- Waterproof ink drawing pen (fine)
- Double-sided sticky tape
- Heatproof varnish

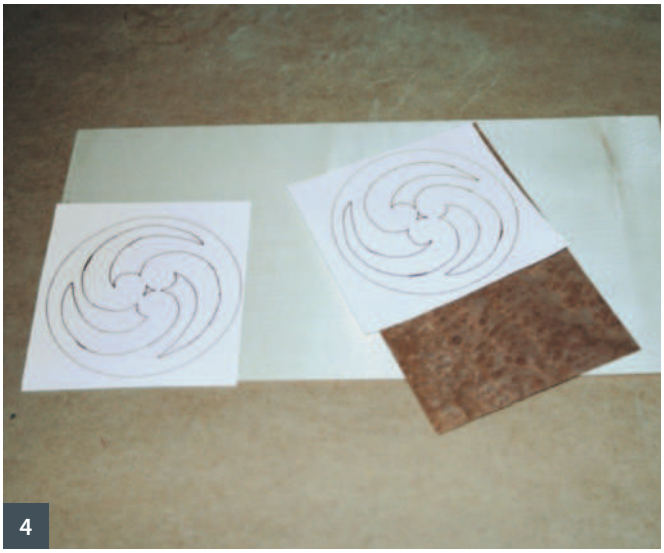
Tools:

- Scrollsaw or hand fretsaw
- Router with straight bit or chisel
- Sharp craft knife, scalpel or chip carving knife
- Compasses









PHOTOGRAPHS BY GMC PUBLICATIONS

1 Use the router to cut out the coaster bases **2** Tidy the edges with a knife… **3** … then cut out the discs **4** Choose which motif to make first and stick templates to two veneers

Making the coaster bases

1 Sand both sides of the timber that will be used for the coaster bases and use a pair of compasses to draw out six coasters, using the template as a guide to help you set the radius of the inner and outer circles.

2 Set the router at a depth to match the depth of the veneer, plus a little extra to allow for gluing and sanding. In my case it was 0.7mm in total. If it is not possible to use a circle guide with your router because of the small circumference, hold the base plate of the router instead of the handles to gain more control. Rout out the central section of each holder up to the inner line. It is easier to rout the bases before they are cut out individually, as shown, as this gives the router base a bigger area for support.

3 If necessary, tidy up the routed edges with a sharp knife. It is a good idea to rout just inside the final line if you are in any doubt about being able to cut accurately to the line, and you can then cut back to the line with a knife.

4 Cut out the six discs, following the outer line, using a scrollsaw, jigsaw or fretsaw.

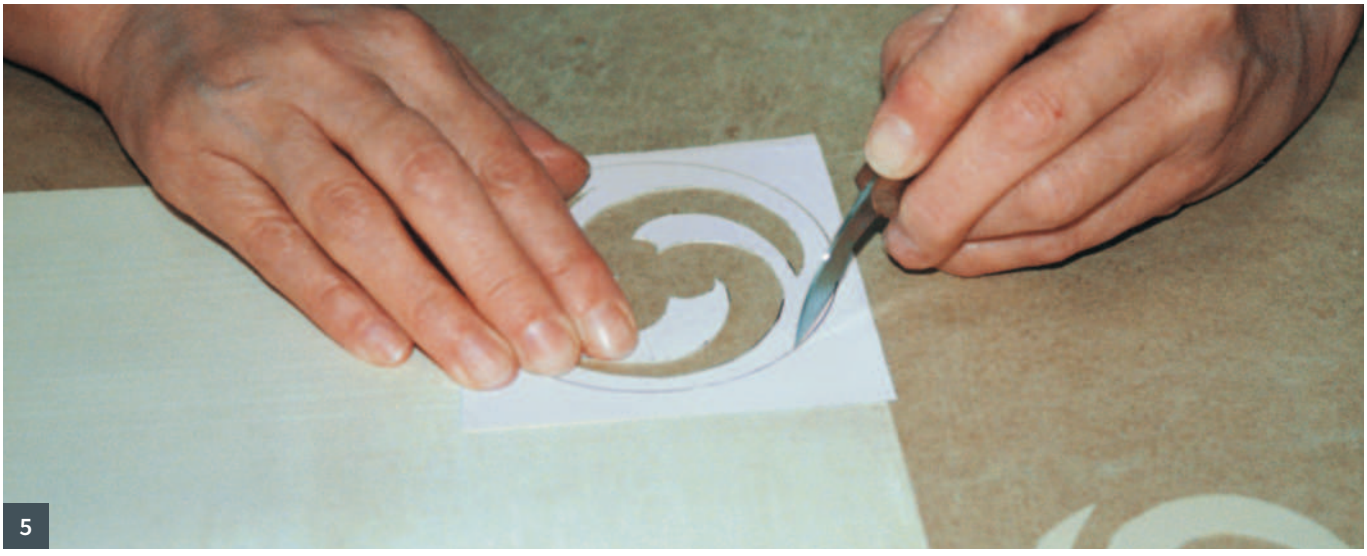
Making the motifs

5 Choose one of the motifs and make two photocopies. Stick a template to each of two contrasting coloured veneers, using a spray adhesive.

6 Using a sharp craft knife and a cutting board, carefully cut round the design, but do NOT cut any of the crossing lines of the knotwork patterns. As each section is cut, cut the same section of the contrasting veneer and gradually rebuild the pattern by swapping the cut pieces. The cuts must be made to follow the lines of the design accurately, so that the pieces will fit back together perfectly when swapped.

7 Spread a thin, even layer of glue into the routed area of the coaster base and carefully stick the re-assembled pattern into place. Some varieties of wood veneers can cockle quite easily, for example the burr veneer used in the spiral motif, so apply pressure for as long as necessary to make sure all the parts of the veneer stick firmly.

8 The fine corners are susceptible to breakage when the grain runs across the design, which is unavoidable, so make any necessary repairs to the veneers using small offcuts. Don't be put off if the



5 Carefully cut around the design **6** Leave the coaster to dry before completing the design **7** Cut a section in the holder to make accessing the coasters easier

coaster looks a little disappointing at this stage. Leave it to dry thoroughly then gently sand it level using fine garnet paper. Clean with a little white spirit on a lint-free cloth and the fresh colours of the veneers will be revealed.

9 Draw in the remaining lines of the design using a fine, waterproof ink drawing pen, then give each coaster two coats of heat-resistant varnish, rubbing down gently between coats. Varnish the bottom and sides as well, to prevent any movement of the wood.

10 Cut out two or five more designs in the same way, depending on whether you want sets of three or six different patterns, then make into coasters as explained above.

Making the holder

11 Take the remaining timber and cut a 4–6mm section from the bottom. If you do not have the facilities to do this yourself, your local builders' merchants or wood yard will probably oblige. Stick this piece back to the bottom – using double-sided sticky tape – ready for stack cutting.

12 Use compasses to draw the template for the coaster-holder onto the top of the timber, again using the template as a guide for the radius of the two circles. Alternatively, the template can be stuck directly on to the timber if preferred.

13 Cut around the outside circle of the template then separate the two pieces.

14 Taking the largest top section only, drill a pilot hole in the middle, then cut round the inner circle using a scrollsaw or fretsaw. Glue this onto the base and leave to dry.

15 To facilitate removing the coasters from the holder, cut out a section from the side of the holder measuring 35mm deep by 15mm wide, and round it at the bottom, as shown.

16 The top of the holder can also be rounded over to give a smooth finish. Varnish in the same way as the coasters (see step 9) then, once the varnish is dry, place the coasters in the holder.

Restoration of the Willow Tea Rooms

Kieran Binnie learns about the painstaking work involved in bringing the iconic Charles Rennie Mackintosh design back to its original glory

For over a century, the Willow Tea Rooms at 217 Sauchiehall Street have been a Glaswegian landmark. First opened on 29 October 1903 by Catherine Cranston, at a time when the popularity of the temperance movement meant that tea rooms were seen as a more morally appropriate meeting place than pubs, the Willow Tea Rooms are a key site for aficionados of the work of artist and architect Charles Rennie Mackintosh (1868–1928). After spending many recent years in a state of disrepair, the Willow Tea Rooms re-opened in 2018 following a painstaking restoration project which included faithfully recreating Mackintosh's artistic vision and some 400 pieces of Mackintosh-designed furniture.

History of the Tea Rooms

The Willow Tea Rooms were the fourth tea rooms owned by Mrs Cranston for which Mackintosh had provided design, but they were the first where Mackintosh was responsible for the entirety of the design. This opportunity allowed Mackintosh to stamp his vision upon the tea rooms, from remodelling the exterior of the 1860s tenement in which they were situated, to the sumptuous internal decoration, to each item of furniture, tableware and even the staff uniforms. While the Glasgow School of Art (which was sadly ravaged by fire one week after the Willow Tea Rooms re-opened) is commonly seen as the pinnacle of Mackintosh's work, the Willow Tea Rooms are a tour de force of Mackintosh's creative vision and should not be overlooked, in large part due to the artistic control Mackintosh was able to exert.

The 200-seat tea rooms comprise five distinct spaces across four floors within the tenement. The ground floor contains the Front Saloon and Back Saloon, above which is the mezzanine Gallery on the first floor. These rooms are typified by the black-stained ladderback chairs and armchairs. The most iconic room at the Willow Tea Rooms is the Salon de Lux on the second floor, which is furnished with dazzling silver and purple highbacked chairs and matching tables. The Billiard Room features black booths in an echo of the furniture found in the Front and Back Saloons. The furniture, although stunning, is only one facet of Mackintosh's design, and throughout the tea rooms there are recurring motifs in stained glass, plaster friezes, sculpture and upholstery.

Sadly, Mrs Cranston sold the Willow Tea Rooms in 1917, following which the space was operated under a number of different names and functions, including as part of a department store and later as a jewellers. A forced sale of the building in 2014 raised the prospect of the surviving furniture being purchased by private collectors, and a loss of a significant Mackintosh site. In response, Glasgow-based businesswoman Celia Sinclair established the Willow Tea Rooms Trust as a charity, with the purpose of saving the Willow Tea Rooms for future generations. What followed was a two-year renovation project costing £10m and which, fittingly for a project inspired by Charles Rennie Mackintosh, was unrelentingly focused on detail and perfection.

PHOTOGRAPHS BY KIERAN BINNIE

RIGHT: Mackintosh at The Willow, as it is today
LEFT: Mackintosh's design vision encompassed every aspect of the team rooms, including recurring motifs in plaster friezes and doors. This is the door to the iconic Salon de Lux

The Front Saloon is typified by black-stained oak ladderback chairs and tables

The ladderback chairs feature steam-bent rungs and hand-woven rush seats

Reproducing 125 ladderback chairs required cutting 3,250 mortises and tenon joints all by hand

Rebirth

The overriding ethos of the restoration project was to return the Willow Tea Rooms to how they would have been when doors first opened on 29 October 1903, including recreating the furniture, decoration and even the position of the furniture within each room. The dilapidated condition of the tea rooms meant that a forensic approach was needed in order to gather the necessary information including analysing paint and fabric fragments, and examining photographs of the early days of the tea rooms. Much of the original furniture had not survived the turbulent later years, and to recreate the 400 pieces of furniture necessary meant that in many cases the only guidance available was to be found in Mackintosh's original designs, as well as extant pieces held in the collection at the Glasgow School of Art, and some research by previous furniture makers and scholars.

Following a tender process that included each tendering maker building a sample chair, the Trust employed three Scottish furniture makers to reproduce the furniture – see the website links included at the end of this article for more details on the makers involved in the project. Angus Ross was engaged to build 125 ladderback chairs for the Front Salon, Back Salon and Gallery, while Bruce Hamilton built the 33 armchairs used in those rooms. Character Joinery provided a team of three cabinetmakers, two apprentices, a French polisher and director Melvin Murray, to build the furniture for the Salon de Lux along with the curved cashier's order chair in the Back Salon and the waitress stools.

Despite the lack of extant original furniture, the Trust insisted that all furniture built for the tea rooms had to be an exact reproduction of the originals, including finishes, materials and scale. While the Glasgow School of Art held examples of the ladderback chairs and armchairs, there are no known surviving examples of much of the Salon de Lux furniture, and Character Joinery had to work from photographs of the tea rooms from 1905 and 1980, Mackintosh's sketches and previous research into the Salon de Lux round table and hatstand by luthier Josep Melo. From those sources, it was possible to not only reproduce the furniture for which Melo had made drawings, but also apply the same proportions and construction details to the other tables situated in the Salon de Lux. Analysis of paint fragments identified that the striking silver paint used for the Salon de Lux furniture was formed of layers of white primer, gold flake and a top coat of aluminium flake. After further research and testing, a method was devised in which the silver top coat was applied to the underlying gold flake as a mixture of 12 micron sized aluminium flake suspended in resin, allowing the furniture to be buffed to a high sheen, with the gold flake middle layer adding a sense of depth. Finishing the furniture in the Gallery, Front Salon and Back Salon involved testing modern finishes until a combination of black stain, black oil and black wax was approved by the Trust and adopted by both Angus Ross and Bruce Hamilton for their respective commissions.

It would be easy to assume that a reproduction project on this scale would have necessitated a large proportion of work being done with power tools and machines. However, that was not the case, largely because Mackintosh's designs call for subtle curves, tapers and chamfers that change in depth and radius, all of which can be time-consuming and difficult to set up for power-focused work. Instead, the three makers adopted a largely hand tool approach for cutting joinery, shaping components and preparing the many decorative elements. The cashier's order chair in the Back Salon is a striking example of Mackintosh's use of curves and the benefits of handwork, as the lattice is comprised of tapered and shaped uprights, between which

Sculpture in the Front Saloon

The armchairs combine a bold silhouette with subtle use of chamfers

curved infill pieces are fitted to create the horizontal lines. In many reproductions the design of this piece is simplified by using straight uprights, which removes the need to fit each infill individually, but such simplifications were an anathema to the restoration project, and the cashier's order chair was made to Mackintosh's design, embracing the need for detailed fitting by hand.

While the Trust placed an emphasis on faithful reproduction of the finishes, materials and proportions of the original tea room furniture, the furniture makers were given the opportunity to improve on some of the original construction methods for the sake of ensuring that the reproduced furniture would withstand the rigours of daily use. Mackintosh's designs are rightly celebrated for their blending of Arts and Crafts, symbolism, and Art Nouveau (in what became known as the 'Glasgow style'), but he approached design as an architect rather than a furniture maker, and so often neglected to account for the material properties of wood. Original Mackintosh furniture often features undersized joinery and a disregard of the need to minimise grain runout in chair components, both of which can result in the early failure of the piece. For instance, the curved back of the Salon de Lux chairs was originally carved from solid oak, which decreased the amount of continuous grain, and resulted in breaks at the point where the grain ran out, as well as undersized tenons in the seats snapping. To address this, the reproductions were made from laminating oak veneers to the required thickness, providing a stronger form to the same dimensions and shape. Similar issues were identified in the original ladderback chairs, where the curved rails had been cut to shape from solid material. To improve on the construction method while staying true to Mackintosh's design Angus Ross steam bent oak for the curved rails.

Protecting a legacy

Mackintosh at the Willow, as the Willow Tea Rooms are now known, opened its doors on 2 July 2018, with the official opening on 7 September 2018 being officiated by the Duke and Duchess of Rothesay. As well as being the custodian of a Mackintosh landmark, Mackintosh at the Willow is also a not-for-profit social enterprise providing training and employment opportunities to young people through a partnership with the Prince's Trust. For furniture makers and those with an interest in design, the restored tea rooms offer a masterclass in design and in painstaking reproduction.

RESOURCES

www.mackintoshatthewillow.com
www.willowtearoomstrust.org
www.angusross.co.uk
brucehamilton.co.uk
characterjoinery.co.uk

Booths in the Billiard Room

The decoration in the Salon de Lux echoes the design elements of the furniture, and incorporates plaster, textiles and glass as shown above

The sign hanging outside the tea rooms incorporates similar motifs to the internal decoration, and emphasises Mackintosh's attention to detail

RESTORING UPHOLSTERED CHAIRS

Louise Biggs tackles two damaged chairs in need of TLC

One of my customers brought in two upholstered chairs which were rather loose and wobbly. My initial assessment was that, to do the work properly, the upholstery would need to be completely removed. The client was happy for me to proceed.

The problem with upholstery is that it can hide many faults and as such until it is removed you cannot see how bad some faults are. Having stripped the upholstery from the first chair a maker's stamp was found on the underside of the front rail. Overall this chair was not in too bad a condition. Then I came to chair two – and a totally different story.

Assessing the chairs

CHAIR ONE

MAHOGANY WITH MAKER'S STAMP

- Applied carved block in oak crosses the bottom of the back splat and over the back rail.
- Loose joints on the seat rails.
- Arm uprights were loose where they join the seat rails.
- Multiple breaks to the arm uprights.
- Dowels and screws through the seat rails into the arm uprights.

CHAIR TWO

MAHOGANY AND WALNUT

- Applied block crosses the bottom of the back splat and over the back rail.
- Loose joints of the seat rails.
- Arm uprights loose where they meet the seat rails.
- Arm uprights have multiple breaks at top and bottom, the bottom ends are tied with wire and have a mass of car body filler and some other metallic type filler.

MAKER'S STAMP – 'A. BLAIN & SON LIVERPOOL'

In 1835 Arthur Blain established his business in Paradise Street, Liverpool. Originally stamped 'A. Blain' on early examples of his work, the later Victorian period pieces were stamped with '& Son'.

Arthur died in 1868, and his son William Hughes continued the business until his death in 1909.

1 Chair 1: Carved oak block crossing the back splat and back seat rail

2 Chair 2: Arms tied up with wire and covered in car body/metallic fillers **3** Screws and dowels through the seat rails and into the arm upright **4** Metal bracket holding a split rail and front leg together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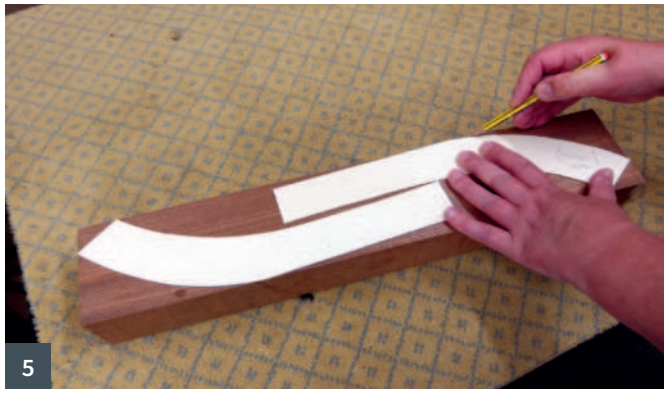
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PHOTOGRAPHS BY LOUISE BIGGS

Stages of restoration

1 Having marked all the various parts of the chairs, the first stage was to remove the two applied blocks spanning the back rail and back splat. Both had been partly inset into the back rails. With the screws removed, I used a Japanese cat's paw and hammer to separate the blocks from the chair frame. Underneath both blocks was a mass of car body and metallic type fillers.

2 Concentrating, for the moment, on chair two, the wires around the base of the arm uprights were loosened enough to be able to cut the wire. Most of the filler came away with the wire, revealing a badly fitting joint and more filler within the wood section.

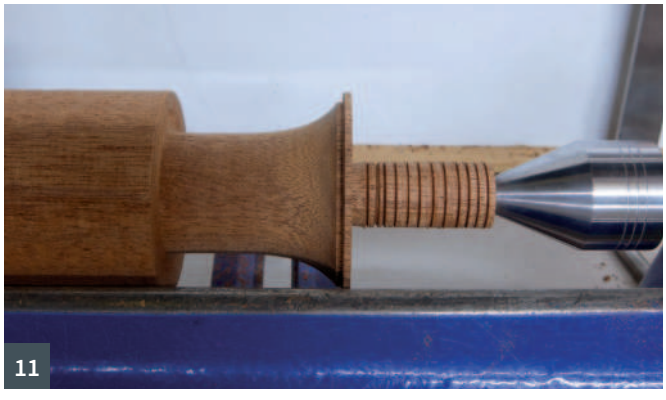
3 Each arm upright was held in place with several screws of varying size. When I removed the top rail, the back splat and uprights were also removed which revealed further damage: broken dowels and screws, damaged screw heads and more filler.

4 The remaining chair frame was disassembled. Due to the many fixing points for the arm uprights, both side seat rails fractured around this area; there was little timber actually left holding them together. The back seat rail had a split at one end which incorporated a large knot area. Given the amount of damage, and judging that this chair was a made-up piece, I decided to replace these seat rails.

5 Holding the broken pieces firmly together, templates of the three rails were made on card, marked as to their position and cut out. Timber was prepared to the required thickness using a planer/thicknesser and the new rails were marked out and identified.

6 Using a bandsaw the new rails were cut to shape before the cut surfaces were squared and cleaned up using a jack plane and flat- and round-bottomed spokeshaves. The ends of the rails were cut to the required angles.

7 The back legs were joined with four dowels running through each leg and into the rails either side. Working each rail in turn, they were positioned in the vice so the end surface was level with the bench surface. The back legs were then clamped in position over the rail end. The existing holes through the leg were used as a drill guide for drilling the dowel holes in the new rails.



8 Broken dowels in the front legs were drilled out and centre points inserted to mark the position of the dowel holes on the front end of the side rails. Once marked the rails were held in the vice and drilled to the correct size.

9 Gluing up the back legs and rail required a shaped clamping block, which was made large enough to allow cut-outs for the sash clamps to be in-line with the dowels. The pressure from the clamps pulled the legs to the rail squarely, tightly closing the joint surface.

10 Before gluing up the main frame the front legs had to be extended. The castors were removed and the holes were drilled out and plugged with dowels. Once these were dry, I decided to level the end of the legs off below the bottom bead, the small fillet that was evident would be reformed on the new section of turning. A flat-bottomed spokeshave was used in a circular motion working from the edge into the centre to form a slightly concaved surface.

11 Taking details from the other chair, the new leg sections were turned using a spindle roughing gouge, parting/beading tool and a spindle gouge. The timber was held between ring centres. Forming a small fillet and step, a dowel was formed to the same diameter as the drill which would be used to drill the leg. The foot shape, a half cove leading down to a straight section, matched that on the other chairs and the shape was checked using a profile gauge. The feet were then parted off.

12 The corresponding hole for the dowel was drilled into the end of the legs with the aid of a drill guide which holds a standard power drill. The drill guide was held on the surface of the bench, making sure that the legs were held in the bench vice perfectly upright. The drill was then plunged down, held by the uprights and springs.

13 With the holes drilled the new leg sections were glued in place and held with sash cramps. Once dry, the remainder of the seat frame was glued up using the clamp block from step 9 and two additional clamp blocks in order to position the sash cramps in the required positions: two front to back to pull the front leg joints and two criss-crossing the frame to pull the back legs to the back of the side rails.

14 Where the applied block had been cut into the back rail the holes were plugged and a wedge-shaped piece of timber was glued into place. This was then shaped into the curve of the rail. While the glue dried, all the holes in both ends of the back splat and the arm uprights were plugged with timber.

15 New dowel holes were drilled in the back splat and arm uprights and, using the dowel centres as before, the top section of the chair was positioned on the seat frame and the hole centres marked. The corresponding holes were then drilled and the dowels inserted.

16 The top frame of the chair was then ready to be glued and clamped into place. Chair one was treated in the same way: the frame was knocked apart and then re-glued using the same cramping blocks.

17 On one arm section screws had been passed through from the top into the upright. The screw holes were plugged before a long tapering joint was cut over the area. Longer joint lines are less obvious and parts of these lines followed the grain in the timber.

18 A section of timber was cut to fit and glued in place. Once dry a spokeshave was used to shape the infill timber to the shape of the arm. Other minor repairs were carried out but in most cases these were to put strengthening dowels through splits in the least obvious position and to infill any other screw holes.

19 All the repairs were stained and polished to match the existing timber and all polished wood areas were given several good coats of tinted wax. The chairs were then sent to the specialist upholsterer T & M Upholstery for the upholstery to be reinstated with new webbing, cover material and antiqued upholstery nails. A small panel of fabric was fitted at the bottom of the back splat to replace the applied timber shapes.

20 The chairs were now ready to return to my client. Chair two, the one so extensively repaired, is shown on the right-hand side of the photo. It's slightly lower than chair one but now looking more compatible.

DOWEL-MAKING JIG

Alan Holtham makes a simple jig to aid dowel construction

This is probably the simplest and quickest router jig you will ever make, but it is certainly a very effective way of making your own dowels. You won't need much in the way of materials to make it, though the router does have to be mounted under a proper table.

The making process described here may all seem a bit long-winded but once the jigs have been made there is no limit to the type and size of dowelling that can be produced, and you don't need a lathe!

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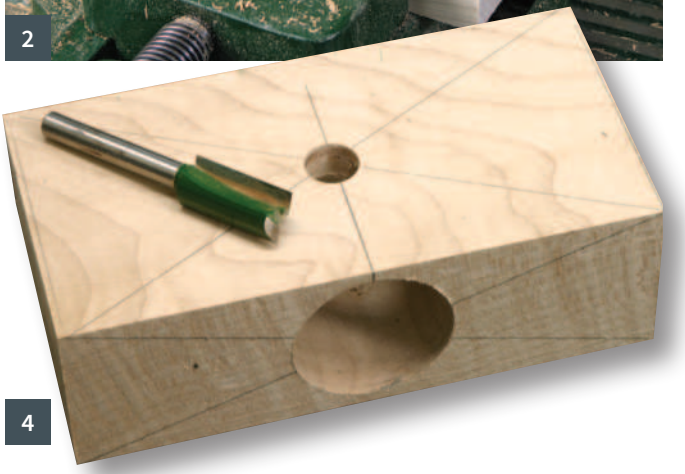
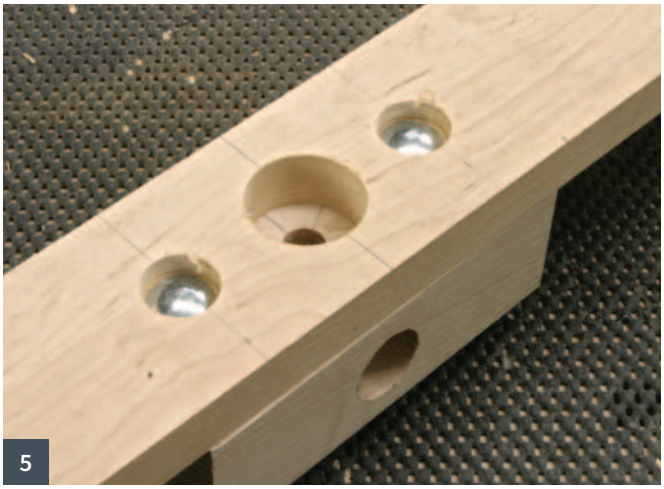
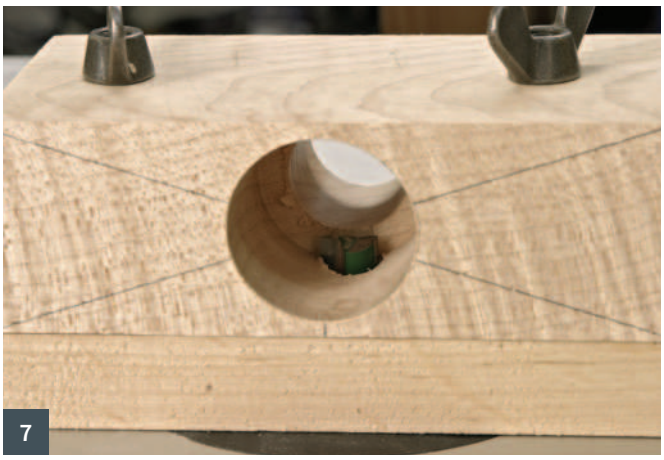
Making the jig

1 All you need is a thin strip of strong timber the length of the router table and a short block for the guide section. The two pieces are held together with bolts and wing nuts only because I anticipate developing it into a modular system with different guide blocks for different-sized dowels. For a one-off jig, however, the two pieces could be glued and screwed together.







PHOTOGRAPHS BY ALAN HOLTHAM

2 The block requires two accurately drilled holes if it is to guide the timber properly. One hole has to be the exact diameter of the finished dowel, this is the out-feed hole. The other in-feed hole has to have a diameter equal to the diagonal length of the end cross section of the initial timber. Don't worry about having the exact size; just vary the initial square section to suit the bit diameters you have, provided they are not too far out. The important thing is that these two holes are concentric and they meet in the middle of the block. Using a drill press, drill the larger diameter first and then follow on with the smaller one.

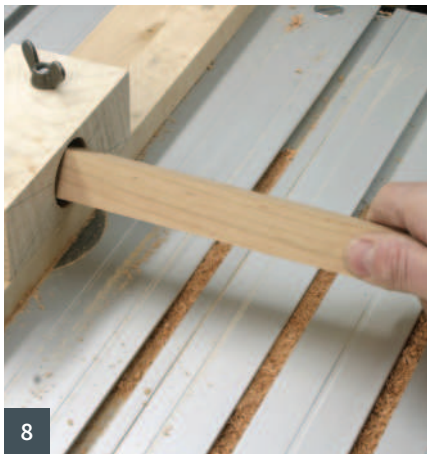
3 Sawtooth or Forstner bits will leave a clean and accurate hole, this being the only critical part of the jig. If they are out of line the dowel will not feed through properly.

4 Next drill a hole through the face of the block of a diameter to match that of the cutter you are going to use to form the dowel. I just used a 12mm straight bit, which left a reasonable finish but I wonder if a core box cutter with its rounded end would be more gentle.

5 Bolt this block to the middle of the support strip, having first drilled a central opening to allow some leeway when you are setting it up on the table.

6 As the cutter settings are critical it is also essential to have a fine height adjuster on the router so you can make tiny adjustments if necessary. Fix the router under the table and set the cutter so that it protrudes through far enough for you to locate the block over it. Fix the support strip in this position by clamping it to the table at either end.

7 Wind the cutter up until the tip just lines up with the diameter of the out-feed hole.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8 With the router running, now feed the square section into the in-feed hole and rotate it against the cutter to start forming the dowel.

9 The initial results were rather disappointing and although the dowel was formed the finish was poor and uneven.

10 This was improved a lot when I waxed the inside of the out-feed hole to make the emerging dowel slide more freely as it also allowed me to drop the cutter fractionally and make the fit correspondingly tighter.

11 I also realised that the square section was slightly undersize and was rattling about slightly in the in-feed hole. There is no correction for this, just re-machine the blanks a bit bigger. However, although these modifications helped a lot the finish was still not as good as I needed and a rethink was necessary.

12 By chance I came across an illustration in an old magazine showing a bar-fed lathe where the material was rotated as it was fed in to a revolving cutter. This set me thinking about rotating the dowel material, the obvious method being via an electric drill. I screwed a large screw into one end of the blank and cut the head off to form a gripping spigot.

13 This is then held in the drill set to rotate at about 500 rpm and the spinning blank is fed in as before.

14 Now the results are totally different and a smooth, even dowel forms very rapidly.

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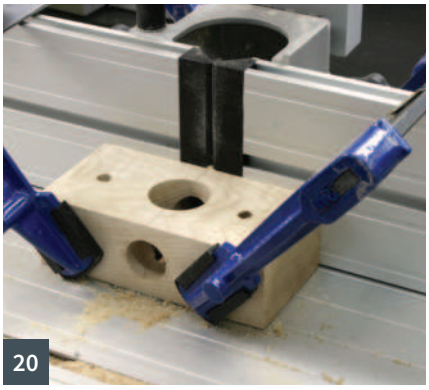
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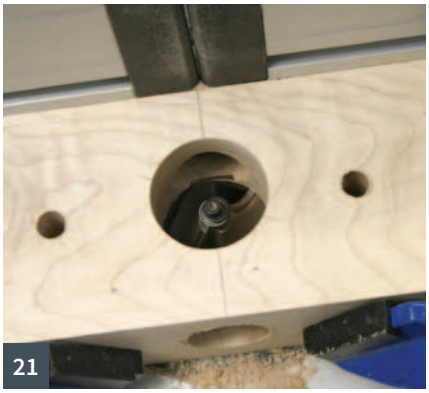
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15 In fact the combined rotation of the cutter and the blank actually pulls the material through the jig and a whole length is formed in seconds. You have to actually hold it back or the cutter will jam.

16 I had great fun knocking off dowels in a range of different timbers, experimenting with both the speed and the direction of rotation. Putting the drill in reverse eliminated the pulling action and resulted in an even better finish, but the danger is that the gripping screw comes undone, so a different holding device is probably needed for the final version. Spinning the drill faster seemed to make very little difference once you get above about 500 rpm, which is good as if you go any faster it becomes difficult to control.

17 You can modify the set-up to form a tenon on the end of the dowel by feeding the dowel back into the same jig but now with the cutter raised up. To form an even shoulder, make an adjustable stop with the grain running lengthwise.

18 With this in place feed the dowel back into the out-feed hole and adjust the cutter up to cut the required tenon diameter.

19 You only need to hand feed this bit rather than use the drill, but spin it several times with the stop up hard against the side of the jig to make sure the tenon shoulder is perfect.

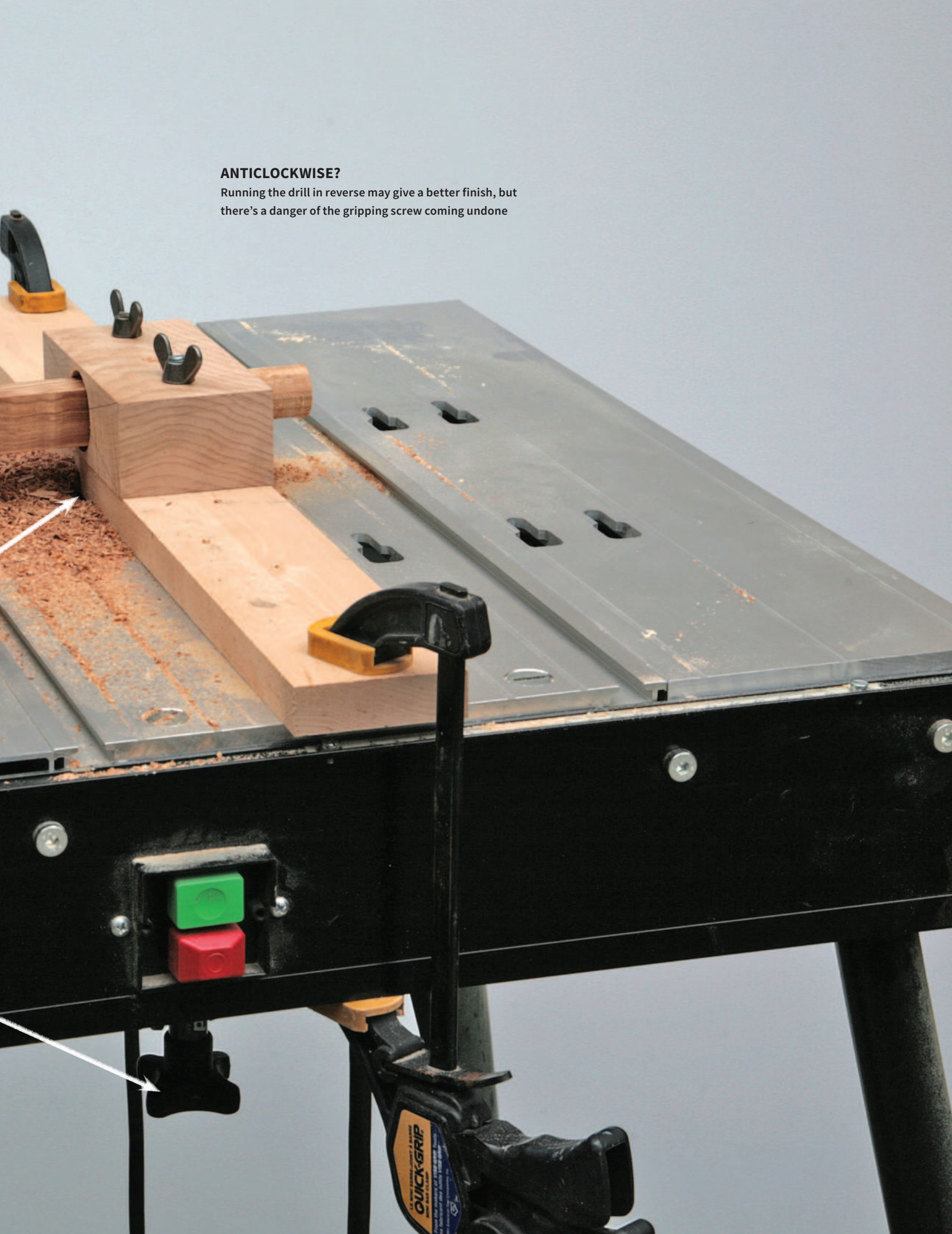
20 To round over the end of the dowel, you can just use an ovolo cutter to form the necessary shape. The guide block for this is similar to the first one but it clamps directly to the router fence, as there is not enough reach on the cutter to go through the support strip as well.

21 There are just two holes in this one. The side one is the same diameter as the dowel again while the one on the face is any size that is big enough to enclose the ovolo cutter.

22 For extra support for this job I also used the first jig clamped to the table as a stabilising block and it allows you to use the adjustable stop to control the cut as well.

23 A few quick rotations produces the perfectly shaped end. It actually takes longer to set up the stop than it does to do the job.

USING THE JIG



ANTICLOCKWISE?

Running the drill in reverse may give a better finish, but there's a danger of the gripping screw coming undone

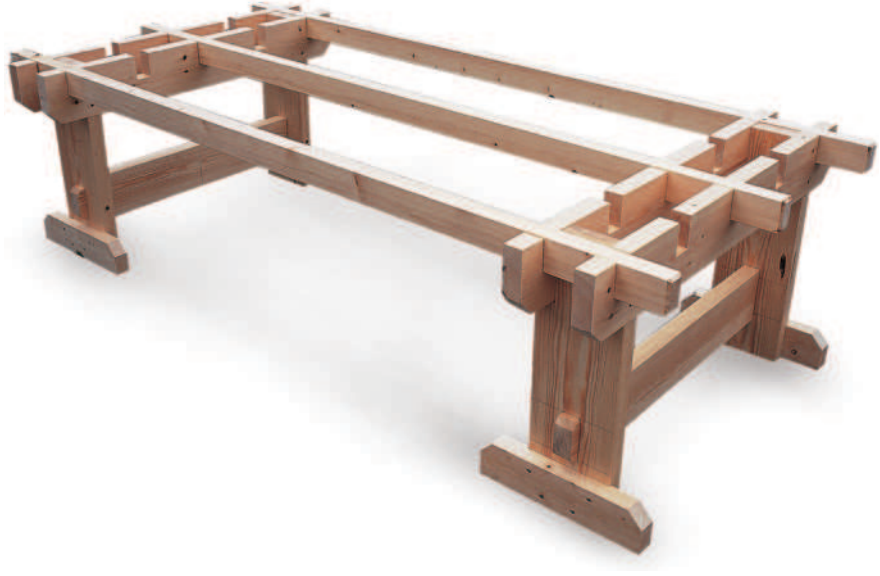
BOARD-CUTTING FACILITY

Anthony Bailey constructs a sturdy support to make cutting large boards a cinch

From time to time you will need to cut out material from large manufactured boards such as ply or MDF. Generally these are 2,440 x 1,220mm, although 3,050 x 1,525mm boards are also available. In this article we will concentrate on the former size, as this is more common. The arrangement I have described here is not unique or very difficult to make – it is just a common-sense solution. There are less sturdy supports on the market, but this solution won't let you down!

Using twinfast screws

Modern twinfast screws can make quick work of assembling softwood structures but you need to take a little care. It pays to pre-drill clearance holes in the top component and to countersink those holes unless the screws you use are designed to self-countersink. It is less important to drill pilot holes in the underneath component as it is less likely to split when screwing the two pieces together. Set the drill's torque ring so the screw heads just set in below the surface of the wood.



PHOTOGRAPHS BY ANTHONY BAILEY/GMC PUBLICATIONS

YOU WILL NEED

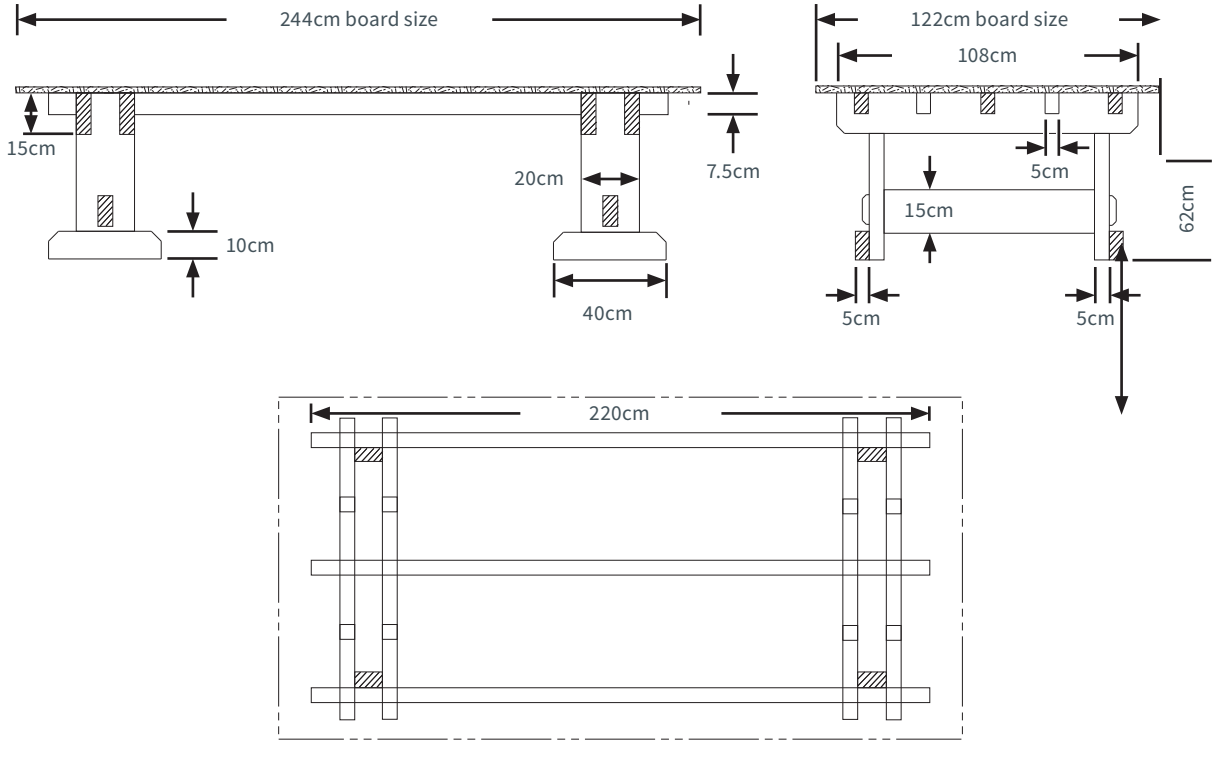
- PAR softwood
- Piece of 9mm MDF
- 150mm nails
- 100mm twinfast screws
- Hardpoint handsaw or portable circular saw
- 16mm stagger-tooth or pocket cutter (½in shank)
- Chamfer cutter
- ½in shank heavy-duty router for mortising, complete with guide bush
- Heavy claw hammer
- Sharp 38mm chisel

CUTTING LIST

All lengths shown are at finished size, but allow a bit extra for trimming:

- **Top rails:** 1,080 x 150 x 50mm x 4
- **Ends:** 605 x 200 x 50mm x 4
- **Bottom rails:** 910 x 150 x 50mm x 2
- **Feet:** 400 x 100 x 50mm x 4
- **Support bars:** 2,200 x 75 x 50mm x 3

DIMENSIONAL DIAGRAM



All sizes are nominal timber sizes

Making the support

1. The set-up must hold 2,440 x 1,220mm sheets. It must hold them flat and you must be able to put the whole thing away so that it doesn't take up precious space. The answer would seem to be a modified sawhorse. Sawhorses in pairs give good work support to long timber and don't take up much space when stacked. However, they don't cope so well with boards that can be thin or heavy and prone to sag. The traditional sawhorse also needs to be made correctly, and involves compound angles for the top, which has to be notched out to take the legs. There is a bit of skill in putting this basic piece of carpentry kit together.
2. As an alternative, I have designed a sawhorse that is much easier to make and works perfectly well. Two of them won't interlock on top of each other, but you can stand one on top of the other for storage. Note how these horses are rather longer than usual – they will give adequate support to the board crosswise, although they are not intended to span the entire width. A key feature of this set-up is the slots in each sawhorse, which take the lengthwise support rails.
3. All the top surfaces are level with each other, and when a full board is placed in the middle there is room all round for cramping a straightedge in place. The additional slots allow you to move the support rails over when you are working with narrower boards. You could of course fit some kind of box underneath to carry bits and pieces, but it will need a lid or it will soon fill up with dust and chips. This set-up works well for home use or for professional routing on-site.
4. This model has the further advantage of being cheap to make, because it only needs standard prepared softwood.

TURNED FOOTSTOOL

Taking inspiration from a vintage woodturning manual, Rick Rich makes a rustic footstool

First I must acknowledge the publication *Elementary Turning* written by Frank Henry Selden, published in 1907, on which this project was based. This book is a training manual intended for teaching woodturning in schools. I am pleased to continue using it as a basis for woodturning classes at my club, the Southwest Washington Woodturners in Vancouver.

The book contains numerous exercises and lessons, and lesson number 28 is a footstool that combines turning with joinery. I can guess that these footstools were likely made with mortise and tenon joins back in 1907, but when considering how to produce these quickly with easy joinery for a primarily woodturning class, a simple dowel drilling jig came to mind. All that is needed is straight butt joints connected by dowels for the siderail pieces to mate securely with the corner post legs.

After making the stool, perhaps you could collaborate with someone who knows how to do basic upholstery to add a finishing touch. Alternatively, you could use some wooden boards to make a top.

I would have preferred to use stock thick enough to make the footstool to the dimensions listed for the one pictured in the book, but I did not have any stock 63.5mm thick for the legs. I considered scavenging from my firewood pile, but nearly all of it was split too small or the wood was end checked too deep in the larger pieces. Instead, I used 50mm-thick red oak and an alder board that I had sitting around.

YOU WILL NEED

- Lathe with bed length of at least 30cm with a stebcentre and revolving centre
- Saw for cutting siderails to length
- PPE, including full facemask for turning
- Dowelling jig
- Clamps (minimum 400mm length)
- Drill and ⅜in drill bit
- Small square
- Pencil
- Wood glue
- Turning tools:
- ¾in spindle roughing gouge
- ½in skew chisel
- ⅜in spindle gouge
- Parting tool (diamond or blade)
- Outside calipers with rounded tips
- Blanks:
- Four leg blanks: 300 x 50 x 50mm
- Four rails: 300 x 90 x 19mm
- Glue blocks: 19 x 19 x 45 with 6mm hole drilled through
- Story stick: 203 x 25 x 3mm
- 16 dowels: 50 x 9mm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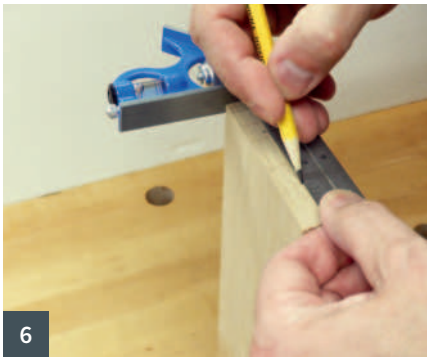
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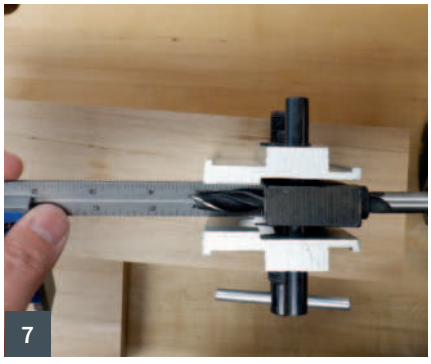
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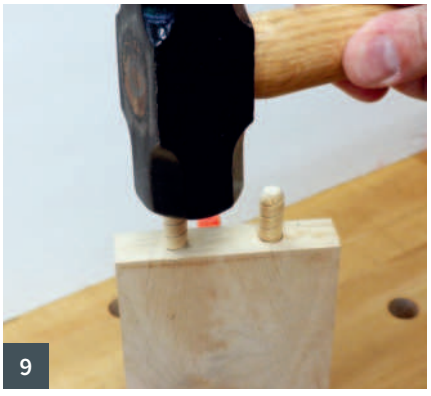
Making the footstool

1. Locate a piece of 50mm-thick stock and a 19mm thick by 88mm wide by at least 1,270mm-long board for material. You may need extra length if there are splits on the ends. Mill the thick stock into four 300mm-long leg blanks and the 19mm board into four 300mm-long siderail pieces 88mm wide.
2. For the siderail ends, ensure they are carefully cut as it is essential to have straight and square boards to mate with the legs. I did so using a cutting stop on my bench, a handsaw and a square piece clamped as a straightedge for the saw.
3. From the 88mm-wide board, cut out the glue blocks to 44mm long by 19mm square. Drill them through with a 6mm bit.
4. Assemble all the blanks and tools you will need. I purchased the dowels purchased from my local hardware store.
5. Determine which leg blank faces will be drilled; they must be adjacent to each other. Measure down 25mm and 6mm down from the top of the blank and mark each. These will intersect with centrelines which will be drawn on each of those marks. The intersections are the drilling points.
6. Each end of the rails will be marked to match the legs. Determine the top edge of each siderail and the inside and outside faces. From the top edge on the ends, measure down 25mm and 63mm down and mark each. Now at each of those marks, make a mark at the exact centre. These are the drilling points.
7. Ready a drill with a 9mm bit. Because drilling starts with the siderails, mark the bit with tape like I did or use a stop to ensure a 31mm drilling depth after the bit passes through the jig. The siderails are drilled a little deeper because I didn't want to take the chance of having dowels butting into each other in the leg blank.
8. Drill the siderail dowel holes. Carefully sight into the jig to make sure it is centred on the mark each time and use the jig to drill the dowel holes in the siderails. This is a double check that allows you to see the intersections if you look into the drilling jig hole. Sometimes the dowelling jig isn't exactly centred and can move a little bit, especially a cheaper jig such as the one I am using. It is best to check for centring each time before drilling a hole. Measure twice, drill once!

PHOTOGRAPHS BY RICK RICH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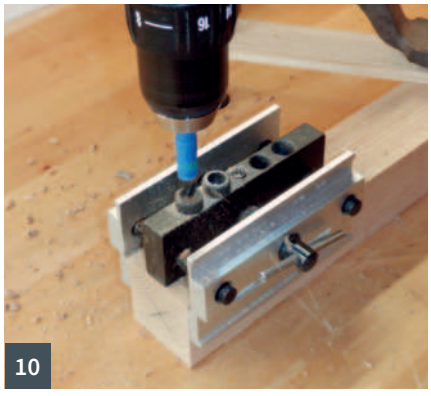
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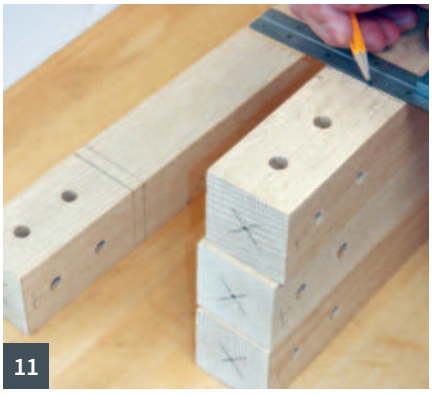
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9 Place a drop or two of glue in each drilled hole and hammer in the dowels. Do this with the remaining three siderails.

10 Now the dowel holes will be drilled on the leg blanks. First mark the bit with tape or use a stop to ensure a 22mm drilling depth after the bit passes through the jig for the legs. Drill all the dowel holes on all four leg blanks.

11 With the leg blanks drilled the square portion layout needs to be drawn. From the top of each leg blank, measure down 100mm and draw a mark. This will be the bottom of the square portion. Measure 9mm above – towards the top of the blank – the first mark and make another one. This will be the transition from the square part of the leg to the round portion. Use a small square to draw a straight line using the marks as a reference. Do this for both marks. One line is usually sufficient, but to be sure the line will be clearly visible while turning you can follow and draw the lines to an adjacent side of the blank.

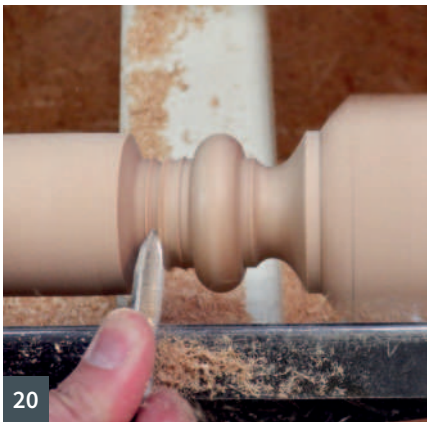
12 Now is when you will need your turning tools! For repeatability, make a story stick with a design of your choice so that each leg will be turned the same. Because the story stick will be up against the rounded portion of the blank, the stick should only be 200mm long. The leg design used here is something I ended up with after trying several other designs.

13 Mount a leg blank securely on the lathe between centres. The square part of the leg will be on the tailstock side. Check for toolrest/banjo and tailstock locking. Check for free spinning and you should be able to see the layout lines.

14 Begin with the parting tool to leave extra material below the square end bottom line so the line can be snuck up to for a precise and clean cut.

15 Turn the transition from square to round with a spindle gouge or a skew.

16 Turn the spindle portion of the leg blank round and cut up to the edge.



17 With the story stick, make the marks on the spinning blank by dropping the pencil tip into the slots.

18 Use the parting tool and calipers to make the sizing cuts. I do this while the lathe is on and am comfortable doing so. My calipers have rounded tips so that they do not grab the spinning wood. If you are not comfortable with this technique, stop the lathe and take the measurement.

19 Turn the blank to your desired design and shape. If using this design, start with the large bead at the top and cut it with the skew.

20 Then cut the top coves connecting to the small fillets.

21 Remove waste at the bottom of the spindle and cut the details in the same fashion as the top details.

22 Connect the two areas of detail with a flat section cut clean with a skew. Once the spindle portion is completed, sand and remove. Repeat for the remaining three blanks.

23 Once completed, the leg blanks can be cleaned and squared on the square top. This can be quickly and easily completed with a smoothing plane. This could be done prior, but I find it easier to do after turning and it allows a crisp edge to the transition between round and square.

24 Now make sure you have all your completed project parts ready for assembly.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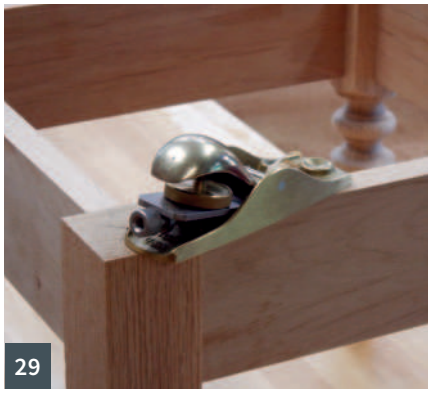
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25 Dry assemble the stool loosely first. It isn't necessary to hammer the dowel joints home, just identify which rails go to which legs and number or mark them accordingly.

26 Glue the stool together two legs and a rail at a time. It is best to glue the rail to the legs first and then clamp them until the glue sets.

27 Once both sets of legs and rails are glued, they can be connected with the remaining two rails. Glue the remaining siderails to the sets of legs.

28 Set the footstool on a bench for the final attachment of the siderails, which may involve a bit of persuasion with a block and hammer. Clamp if necessary and let the glue set.

29 Once the glue is set, the top of the legs and rails can be planed so they are even all around.

30 Turn the footstool upside down to attach the glue blocks. Put a few drops of wood glue on the glue side of the block. Press against the side rail about the middle of the rail and move back and forth slightly and you should feel the glue 'grab'. The blocks can be left as they are to dry or be clamped if you are uneasy about them staying on.

31 Set the stool on a flat surface to find out which legs need trimming. There are many methods to trim legs to length, here are two quick ones for minor trimming.
Method 1: With a hand plane remove wood from the bottom of the longer leg(s) until the stool sits flat. A bench vice is handy to hold the plane while rubbing the leg bottom across the plane at an angle.
Method 2: Sandpaper is placed on the bench and the longer leg bottom rubbed across it. This is the easier method for fine-tuning when it's really close.

32 Your completed footstool should look something like this. It is now ready for finishing and upholstery.

USING A DRAWKNIFE

Anthony Bailey explains how you can use this traditional tool to create a rustic look

The drawknife has been used down the ages to fashion wood into desirable shapes and to form joints. It is a freehand tool that comes in different sizes and can be flat or curved. There are two methods of use: bevel up or bevel down. Bevel down is useful when working in a concave shape but can be harder work as it tries to dig in. Bevel up is used for convex shapes.


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PHOTOGRAPHS BY ANTHONY BAILEY

1 The bevel is finished off with a microbevel on its edge to give it the critical sharpness and strength. To sharpen it, a stone – in this case an Arkansas stone – is taken to the blade and moved smoothly sideways. Be careful as the edge will become very sharp and it is easy to cut oneself.

2 The drawknife is drawn towards the user when working with it.

3 Bevel up is used for essentially flat or convex surfaces and tends to produce a shallower and easier cut, again attack angle makes a difference.

4 Grain direction is all important so study the wood before cutting. Try cutting into angled grain and you will discover that tearing will result. Work in the other direction and the tearout disappears.

5 When working bevel down, you can create a chipped effect on the arris (meeting edge) of the wood for an attractive rustic look.

6 If the drawknife is angled when pulling it, there is a slicing effect which makes using it that bit easier.

7 A round tenon can be formed using the drawknife and with care, a tight fit is perfectly possible. This is useful on simpler furniture such as Windsor chairs or stools.

The axe

The axe may not have much of a place in a modern and technologically advanced world, yet it is a key piece of tool history and still holds a symbolic power

FROM THE STONE AGE... OR FROM THE SKY?

It's estimated that hand axes were used as a cutting device as far back as 1.7 million years ago, yet it took us a great while to understand where these pear-shaped, roughly chipped stone tools actually originated from. English antiquarian John Frere was the first to recognise them as human-made artefacts at the turn of the 19th century; until then, the common belief was that they had fallen from the sky.

A MYSTICAL STONE

Before Frere's breakthrough, folk theories developed to explain the origin and unusual shape of stone hand axes, and they were believed to have supernatural powers. One theory presumed that the stones were formed inside the earth by lightning strikes. Known as 'thunderstones', these were regarded as missiles from the gods, providing good health, strength or protection. In some East Asian folk beliefs, they were known as 'dragon's teeth'.

A VIKING'S BEST FRIEND

Vikings are often pictured with sturdy axes in their hands, and for good reason: the axe was a must-have in the Viking Age (late 8th to mid-11th century). First made with stone, it was an indispensable tool at home and a deadly effective weapon in Viking battleships since most could not afford swords at a time when steel was very expensive. Norse people mastered the art of axe making and, like many other weapons, gave their trusty axes names, usually after she-trolls from Norse mythology.

DESIGNED FOR COMBAT

Battle axes were very common in Europe throughout the medieval era, most particularly the long-handled Danish axe, a weapon of choice to the most fearsome warriors and kings, capable of cutting off the head of a man or a horse. From the Battle of Hastings in 1066 (as depicted in the famous Bayeux Tapestry) to the legendary bravery of Richard the Lionheart swinging his favourite weapon, the battle axe was key to the greatest wars in the Middle Ages, and remained so until the rise of gunpowder.

DOUBLE TROUBLE

Contrary to what you may see on TV, the double bit axe was rarely used for combat – in the heat of the moment, it can actually be as dangerous for the one wielding it as for his opponent! It is, however, ideal for chopping and felling trees; other than that, it mainly served a ceremonial purpose in the ancient world. The labrys, as it is also called, is one of the oldest symbols of Greek civilisation, and has been found frequently during archaeological excavations in Crete.

A SYMBOL OF POWER

The axe appears as an important symbol in various religions and mythologies, and it is associated with power in many cultures. In the Roman Empire, fasces, a bundle of wooden rods with an axe blade embedded in the centre, symbolised authority. Today, fasces can still be found in the emblem of the Swedish and Norwegian police forces as well as in the French national coat of arms, and in Italy, as the name implies, Mussolini used the symbol for his fascist party.

THE AXE REVIVAL

There's no doubt the golden age of the axe is long gone. Mass production of chainsaws began in the late 1920s, and these modern, more efficient tools soon replaced axes for use in forestry. Nowadays, axes are mainly used to roughly chop timber in farming or in the workshop… and in sport. Axe throwing is an event in most lumberjack competitions, and the hobby has recently gained popularity with many venues flourishing in the UK and North America.

A MARTIAL ART

If you want to take your axe-throwing skills further, Okichitaw is a relatively new martial art that teaches aboriginal weaponry fighting, including tomahawks. These small axes were used by Native Americans for chopping and cutting, as well as hunting and fighting. The axes were decorated with eagle feathers to represent acts of bravery. Developed by Canadian George J Lépine in the 1990s, Okichitaw aims to pass down the Cree Indigenous heritage, one of the largest groups of First Nations in North America.

PHOTOGRAPH BY SHUTTERSTOCK

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- Fitted with soft grip rubber feed handles, and a quality 3-16mm keyless chuck
- Features include belt cover safety switch and emergency stop switch

ACCESSORIES

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Axminster Craft Drill Vice - 100mm £49.55 inc vat | Code: 220034

Axminster Drill Clamp 150mm(6") £13.60 inc vat | Code: 910259
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