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WELCOME

Since the last time this magazine went to press, the world has changed completely. Businesses and workshops across the globe have ground to a halt, shops have shut their doors and shows have been cancelled. But in the midst of all this crisis and uncertainty, inspiring craftspeople have turned to their tools to power through the pandemic.

All the inspiring woodworkers, designers and artists who people this issue of *Furniture & Cabinetmaking* have seen changes that look set to add challenges to their businesses both now and in the future – but they have also carried on working, often isolated in their own workshops, crafting out their dreams as they look to better days ahead.

We can find comfort in the fact that, through the ages, there has always been and will always be a place for great craftsmanship – from the beautiful Tudor furniture recently auctioned at Bonhams right up to the 21st-century fusion of mid-20th-century European and intricate Japanese kumiko techniques in Oxfordshire-based Anthony Dain's work, Brian Kawal's gorgeously streamlined furniture, inspired by classic 1950s American cars, and Nick James's work to give a home to fellow makers in Newcastle.

We hope this time in lockdown, which has given many people around the world the opportunity to stop, think and reflect, will bring a new appreciation for craftsmanship, sustainability and unique, top quality furniture.

'It is your reaction to adversity, not the adversity itself that determines how your life's story will develop'

DIETER F UCHTDORF

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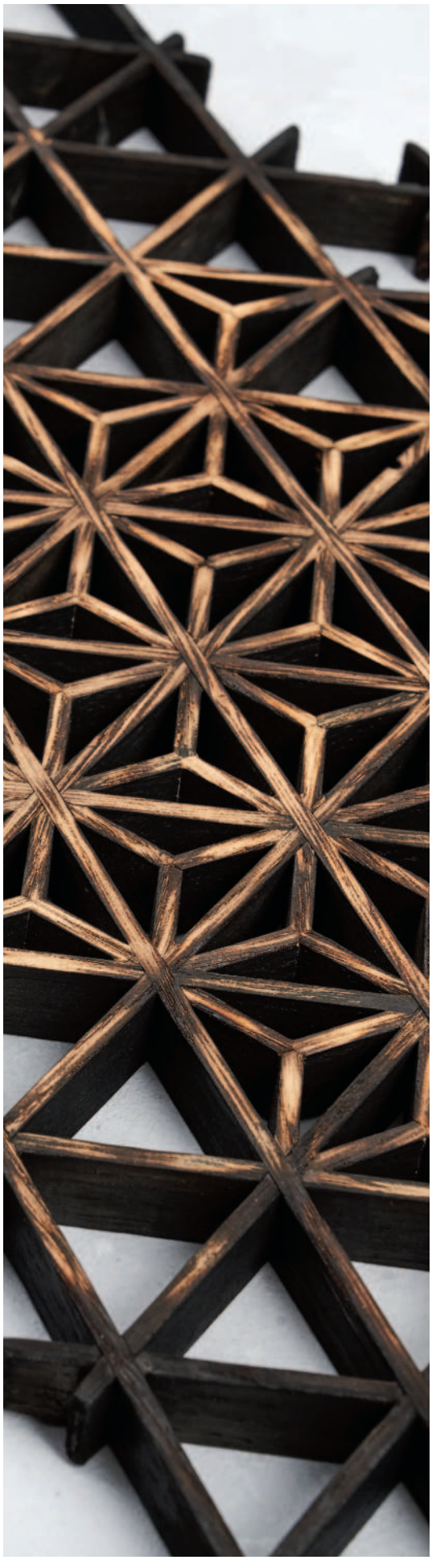
COVER IMAGE Anthony Dain

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.



FURNITURE & CABINETMAKING

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SPEEDSTERS AND SLOW FURNITURE

STYLE AND SUSTAINABILITY MERGE IN **BRIAN KAWAL**'S FURNITURE COLLECTION

Mid-century modern influences, salvaged and sustainable materials and traditional methods are the backbone of hip furniture maker Brian Kawal's business.

A lover of classic cars, his 'passion piece' is the Speedster Lounge chair, which he has sold all over the world. This high-backed, upholstered armchair is inspired by the sleek lines of classic racing cars and Brian regularly holds photo sessions showing the chairs off next to the cars that inspired them. 'I love vintage cars and enjoy driving and racing period Porsches and Datsuns when I'm not working,' he tells *F&C*.

Brian started working in a cabinet shop when he was just 15 years old, and nine years in the business taught him the basics of using tools and making furniture. But he says: 'I was always interested in doing more, beyond the basics that we were producing, so I did a lot of reading into advanced and traditional techniques. I have always been an artist and have drawn my entire life. I began sketching and then building my own pieces.'

His first commission came at the age of 24, 12 years ago, when he met an actress in Bel Air, California, who loved his work and commissioned a piece of furniture. 'When I delivered it she walked me through an empty house she had just purchased next door and I was commissioned to design and build all the new pieces for that house,' Brian recalls. 'I quit my job and began on her project. In the years since I have met and worked for many A-list celebrities, musicians and business people.'

SALVAGE AND SUSTAINABILITY

Being ecologically aware and sustainable is a key priority for Brian, and that starts with sourcing his materials. He takes care to pair up with likeminded companies, so he will know where the wood and lumber comes from and can be sure it is sustainably produced. He also enjoys working with salvaged wood. 'I love showcasing salvaged materials,' he explains. 'Depending on the piece they can create excellent textural elements – panels and top surfaces would be my most common application.'

When using new lumber, he is keen to get wood that has been properly certified. 'It's good to pay a little more for this as it nudges the industry in that direction. It's important that this source is good,' Brian says. When he is working in Hawaii he uses koa and Hawaiian mahogany, but in general his favourite thing to work with is walnut.

When it comes to finishing, the environment again is a key consideration and he tries to avoid high-VOC finishes. Brian says: 'My current favourite finish is Rubio Monocoat. It is a zero-VOC finish, applies easily and is very durable. The amount of non-used product is pretty much non-existent – you don't lose a bunch through overspray and so on. The only thing I can complain about is that it is only available in matt, and sometimes gloss is needed.'

He adds: 'Small batch furniture production doesn't on its own create a ton of waste the way a factory might. Still though, why not do what you can? Save scraps: I have a network of friends I enjoy giving cool pieces of project wood to. Donate them to schools. They love all the small pieces of scrap that might not be suitable for a finished piece in the shop.

'We all have this earth as our home and it's not difficult to see the global results of greed in business. If everyone did what they could it would be a better place. It's unacceptable to look down on the practices of large companies if you as an individual are not willing to make changes.'

BUILT TO LAST

Brian believes traditionally made furniture is better for the environment than modern, industrially made pieces, simply because it will last longer. 'Obviously there are exceptions, but there is so much garbage being made and consumed out there that I think few would really try and argue this,' he says. 'If mass-produced pieces are only designed to last a year or two, or even five, then an average person is generating an enormous amount of waste compared to if they had bought a single high quality piece to begin with.'

Simplicity is key to Brian's design ethos, and his pieces tend to be both easy on the eye and ergonomically pleasing, as well as visually striking. He says: 'It is important to not overcomplicate things. Some of my favourite pieces ever are mid-century modern designs, and oftentimes they have the most basic shapes. I do emphasise function over form, because no matter how cool a chair looks, it's completely useless if no one wants to sit in it.'

Inspiration comes from textures and shapes, both natural and artificial. 'I enjoy seeing really cool shapes in a painting, in a landscape or in a car design and then incorporating elements of these into something unique for the home,' Brian says. In terms of design inspiration, his works show the influence of Maloof, Stickley and Frank Lloyd Wright, while he himself is a huge fan of artist and designer Brian Donnelly, also known as Kaws, street artist Banksy and visual artist George Condo. 'I love the power of their work,' he says. In the trade he is a big fan of Christopher Runge's coachbuilt cars and Matthias Phiessnig's steam bending.

GOING SOLO

With pieces shipping all over the world, Brian has worked with up to three employees at a time on occasion to get his commissions made – but what he likes best is working on his own. 'I honestly prefer the solitude when it is just me in the shop,' he says. 'My wife does a great job helping with the paperwork side of things and she also has a great eye for design, so she helps with that when I'm working on a new piece.'

He prefers to focus on freestanding furniture and is not particularly interested in built-in pieces – although he did design and build a personal library some years ago in Santa Monica, California, which he enjoyed. 'It was complete with fancy carvings, mouldings and sliding ladders, so that was pretty cool. If a similar project like that came along I wouldn't say no,' he says.

Brian's first ever major project was a pair of Maloof-style rocking chairs in walnut, and his favourite work, apart from his Speedster Lounges, has been reproducing 14 dining chairs a client had seen in a museum collection from the late 1700s. Working mainly on commission, he tends to be booked up six months in advance and the pieces he is working on are in all different styles and go all over the world. 'Each one is pretty fun!' he says. 'I am working on a showroom space in LA that blends art and furniture even more. I'm probably most excited about that project right now.'

No project seems too difficult for Brian as he breaks each task down into simple steps. 'Each project has its own challenges, but I've never encountered anything difficult per se. I always break down each part of a project into small, and sometimes very small, manageable steps, and this has always worked out for me.'

With a new baby who arrived this winter, Brian plans to keep his business as usual and is not planning any major changes. 'I really enjoy what I do and am happy where it has gotten me. My plans are to be the best father I can. If my baby boy has an interest in woodworking I will very much enjoy being able to teach him the trade,' he says.

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WORDS: CHRISTINE BOGGIS











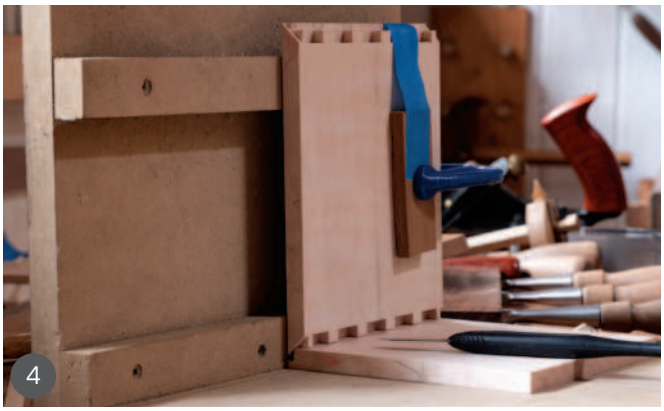

PHOTOGRAPHS: TASHA KAWAL @TASHAMARIEGALLERY; MIKE GATCH @MIKEGATCHPHOTOGRAPHY

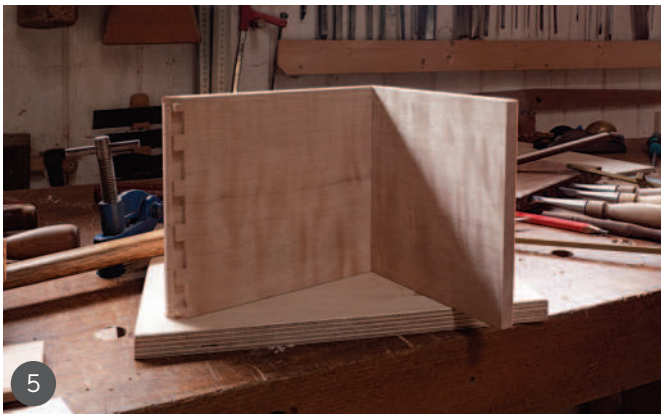
FIGURED SYCAMORE JEWELLERY BOX

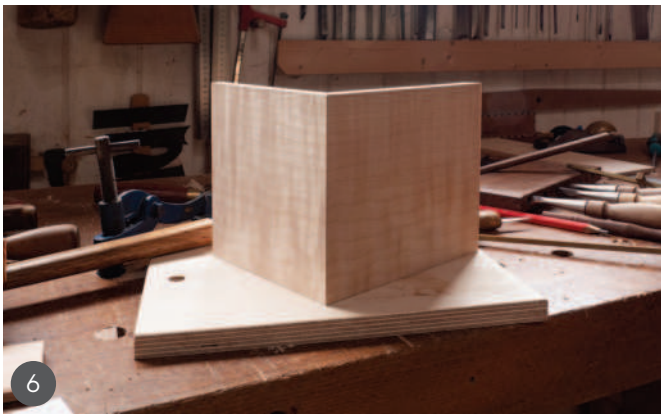
ISRAEL MARTIN MAKES A SECRET MITRE DOVETAIL BOX INSPIRED BY THE WORK OF JAPANESE MASTER, KENJI SUDA

Ever since I discovered the work of Japanese master craftsman Kenji Suda, I have wanted to make my own version of one of his pieces. My chance came when a client commissioned me to make a jewellery box. I named this the MYH box, which are the initials of its new owners.

I wanted to make a carcass with no visible joinery, so I used secret mitre dovetails as the main joinery. I decided to use some beautiful quartersawn ripple sycamore from a wood store that I've had in my workshop for almost a year. Because I didn't have enough for the whole carcass, I used the ripple sycamore for the top and the sides and just a pair of strips to cover the bottom front part. For the hidden part of the box, I used some not-so-figured sycamore. The back was made from a floating panel of quartersawn red cedar. I made the lid or door by laminating three pieces of wood, so it would be as stable as plywood, and I also made three drawers inside. I used ebony strips as details on the carcass and to hide the lamination of the lid.







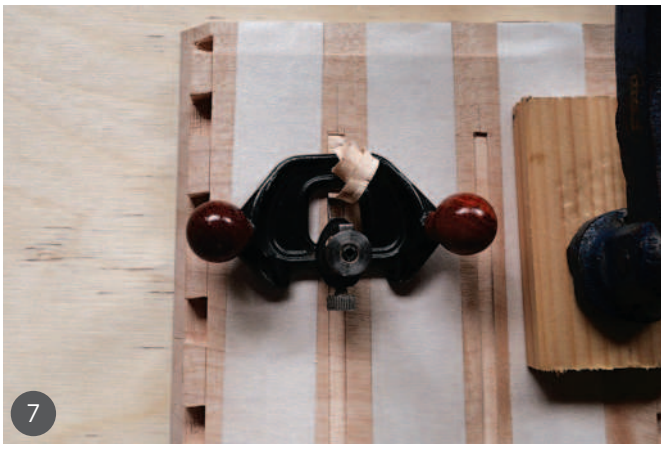
PHOTOGRAPHS BY ISRAEL MARTIN

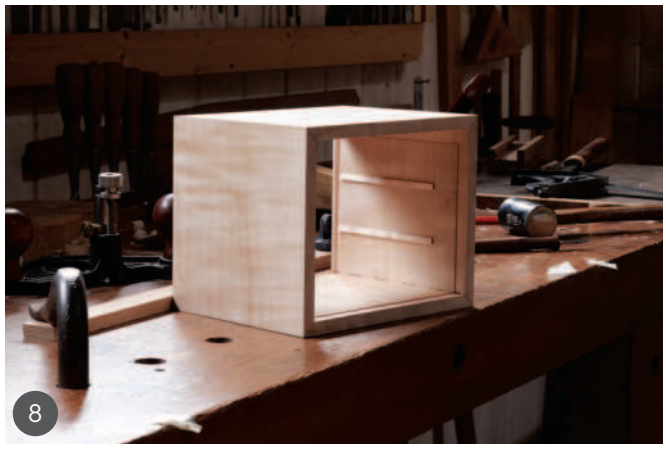
1 Planing the sycamore board **2** Pieces for the carcass **3** Marking the joinery **4** Marking the tails from the pins
5 Testing the first joints (inside) **6** Testing the first joints (outside)

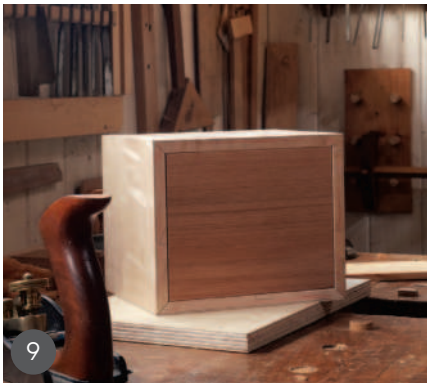
THE CARCASS: SECRET MITRE DOVETAILS

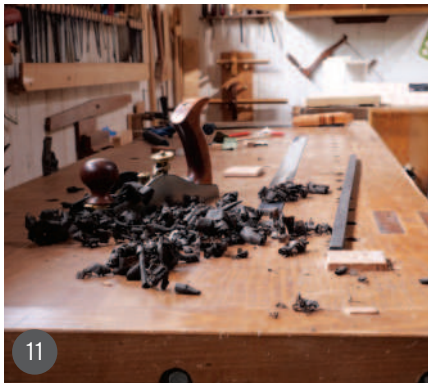
Secret mitre dovetails are a good choice if you want to make a box carcass without visible joinery. Mitres are weak joints that can be strengthened with splines, but secret mitre dovetails are the strongest joint.

I started with perfectly dimensioned boards – normally I dimension one board and then cut it to the appropriate length. That way I'm sure, when doing it by hand, that all the pieces are the same thickness and the grain flows on the box. I made the rebates on the pieces' ends before starting on the pins. I could then mark the tails using the pins and cut and adjust the tails. I tested them, then started making the mitres on the corners. Once I had those mitres, I removed the excess of the central part of the mitres with a chisel and fine-tuned it with a shoulder plane. Here the key to success is to have a perfect mitre board and use the shoulder plane with the thinnest shaving possible. Next, it was just a matter of testing the joints and removing material where needed so that the mitres were nice and tight.









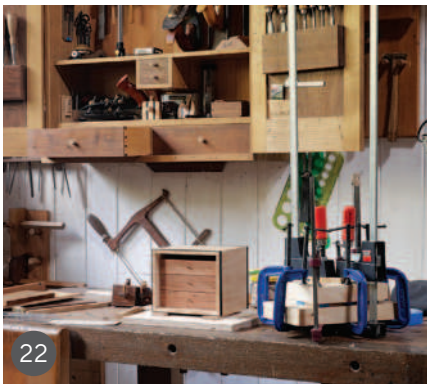
7 Making dados for the drawer runners **8** The glued-up carcass **9** The back, made from red cedar **10** Sawing ebony by hand **11** Planing the ebony strips **12** Planing the inlays once they are glued up **13** The carcass is done **14** Details of the edge inlays

After the main joinery was done, I made the rebate for the lid and the grooves for the back. Because I wanted to add three drawers, I made dados to fit the drawer runners and one to house the lid when removing it. Next, I made the back panel from quartersawn red cedar and fitted it in place.

DETAILS: MAKING THE EBONY EDGE INLAYS

To make the carcass a little bit more interesting, I added some ebony inlays on the edges. First I rabbeted the edges to house the inlays. Then I dimensioned the ebony pieces; I made them a bit thicker, so that after gluing them up I could plane them flush with the carcass. The ebony pieces were also mitred on the corners.

Before gluing the ebony, I smoothed the carcass surface to prevent the ebony dust from getting into the sycamore pores, that's something that has happened to me in the past and it is a bit difficult to remove.



15 The drawer fronts **16** The drawer sides **17** Trimming the tails **18** Testing the drawers **19** Gluing the drawers
20 The completed drawers with their bottoms **21** The plywood core fitted in place **22** Gluing the outer layers of sycamore

MAKING THE DRAWERS

Because there are no drawer dividers, the drawer fronts must be wider than the place for them to cover the runners. So first I made the fronts and adjusted them to their places and then made the sides and backs. I used cherry for the fronts and maple for the sides and backs.

Then it was time to make half-blind dovetails, starting with the tails. Even though I marked the tails with a knife I cut them so that the only adjustment I had to do was to trim their shoulders. Then I marked the pins, sawed them and adjusted the joinery.

The back is joined with tiny sliding dovetails. Normally I leave the drawers a bit wider than needed and adjust them later; ever since I learned this technique from Garrett Hack, I have found it the best possible joinery for the backs. It is faster than through dovetails and you can leave small 'ears' that will allow the bottom to move so you don't need to pull out the entire drawer to see its content.

The bottoms are made from quartersawn red cedar and the middle one is made of cherry, just to add a surprise. I made the pulls using African Blackwood and abalone inlays.

23 The shop-made plywood complete and fitted
24 Fitting the edge inlays to the lid
25 Gluing the edge inlays
26 Detail of the finished lid
27 Removing the waste
28 Chiselling the dovetail angle with the guide
29 Test fitting the joints

OPTION 1: MAKING A LID WITH NO SEASONAL MOVEMENT

I wanted a tight fit between carcass and lid, so I had to take potential wood movements into account when making the lid. In order to do this, I made my own plywood in the workshop. The core is made of seven pieces of quartersawn sycamore glued together. The outer layers are made with ripple sycamore, glued up with the grain perpendicular to the core grain.

I made each part bigger than the place for the lid and carefully adjusted it with the planes, first the core, then glued up the outside. Normally I make two of the four sides perfect, mark them, and then trim the other two until they make a perfect fit.

OPTION 2: ADDING EBONY EDGES TO THE LID

I wanted to hide the three wood layers of the lid so I made some pieces to cover the edges of my shop-made plywood. When I had made the lid, I marked to re-dimension it to allow me to add the ebony edges. I first sawed and planed the ebony, then made a rebate on the ebony strips and cut it to size. I glued them to the lid with mitred corners, then planed the whole to fit on its place.

OPTION 3: SMALL SLIDING DOVETAILS MADE BY HAND

Making sliding dovetails by hand can be a challenge. In small drawers you can use simple dados, but I find it's much better and more durable to make sliding dovetails. I started by making the male with the dovetail plane, and then marked the female with the thickness of the narrower part of the male measure. Then I used chisels and a small router plane to remove the excess. I made a guide with the sliding dovetail angle and installed a magnet so I could hold a wide chisel with the exact angle for the last shavings. It is simple but it works. Then I tested the joint and adjusted the male to get a tight fit.

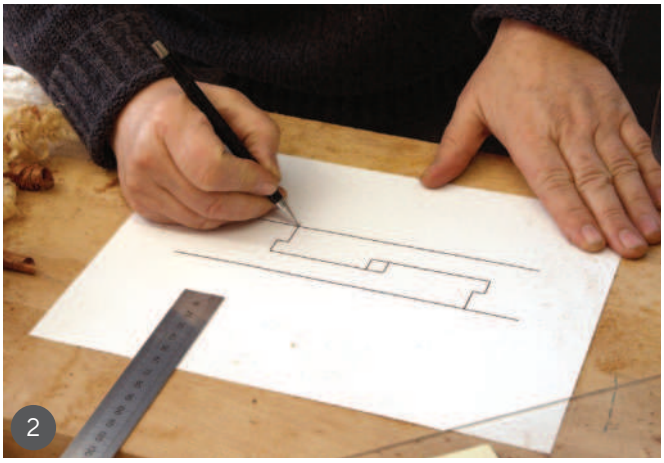
SCARF JOINTS

JOHN BULLAR LOOKS AT THIS CLASSIC PIECE OF JOINERY

Scarf joints are used to fix timbers together end to end. They are used sometimes in cabinetmaking, such as with rare wood that comes in short lengths, but more often in furniture repair or household joinery.

The idea is to turn two short timbers into one long one without changing the external profile, or making the wood significantly weaker. This article focuses on one type of scarf – the double-tenoned variety, which is locked together in the middle with wedges, needing no glue. It would normally have been cut with a saw and chisel but here I will do most of the work with a router.

PHOTOGRAPHS BY JOHN BULLAR



PREPARING

1 Normally, you would be joining two similar pieces of wood but for this demonstration joint, I have used two different hardwoods so it shows up more clearly in the photos. It is equally effective for softwood, provided there are no knots near the joint. Each piece is of the same section, which in this case is 50mm square. Any rectangular section could be used, so long as the wood is thick enough to take the joint.

2 The joint is cut as two identical sections, one of which is then turned over to interlock with the other. It consists of a tenon at the end, then a shallow socket followed by a deep socket with a mortise undercut in it. The cuts are all straight, which makes it is easier than a dovetail, for example, but it can still be confusing. To help me get my head around an unusual joint like this and check the dimensions, I start by drawing it out like this, full-scale on a piece of paper.

3 A router rebate cutter designed for milling is ideal for this joint. The one I used was 31.7mm in diameter, with 5.7mm deep edges. It makes a straight side with a flat bottom. It is also capable of undercutting up to about 5mm or more – ideal for making the square grooves that form the mortises at each end of this joint. Alternatively, if you prefer, it is quite practical to make this joint with hand tools, using a chisel to chop out the mortises.

MARKING

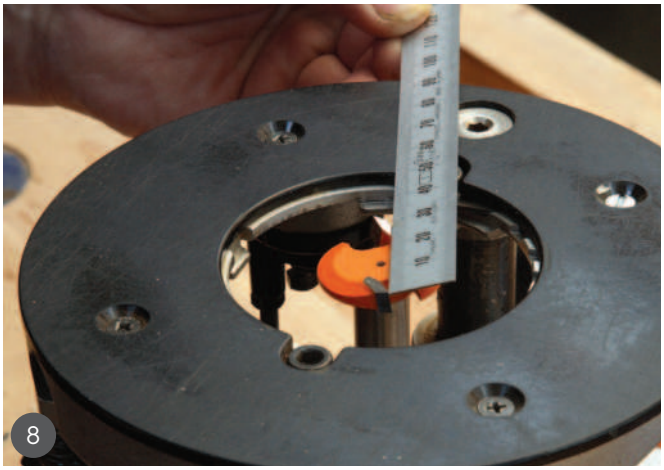
4 Mark out the depth by scoring two lines on the side of the wood with a marking gauge. The outer two sections must be the same depth. In my example they are 20mm each, while the centre section between the lines is 10mm. These dimensions will give plenty of thickness on each side of the finished joint, while 10mm is enough for the thickness of the tenons at each end and the wedges in the middle.

5 The length of the joint is marked out in five positions and then a square is used to draw five lines across the side. These correspond to the positions of the shoulder lines that will be left when the joint is cut. Both halves of the joint are symmetrical so that when one end is turned over, it will fit the other.

6 Areas between the lines will be cut away, and so I shaded them in with a pencil. This isn't strictly necessary but it certainly helps me anticipate how the joint will be formed.

SETTING UP

7 Using a router to cut this joint means that both pieces of wood can be shaped in one operation – not only saving time but also ensuring that they are identical. Line up the ends and sides and then clamp the two pieces together in the jaws of a wide vice or a Workmate.

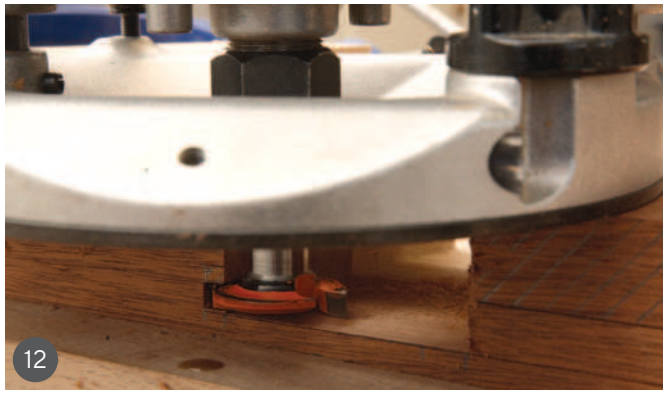


8 With the router unplugged, mount the milling cutter in its collet and stand it sole-up to measure the underside. You need an accurate measure of the offset distance between each of the cutting edges and the edge of the router sole.

THE GUIDE SQUARE

9 This guide square is made from two straight-edged pieces of MDF, screwed and glued together. It is a simple little jig but a most valuable one, and well worth the few minutes it takes to make.

10 One arm of the guide is clamped against the side of the pieces of wood mounted in the vice, while the other arm provides a secure straight edge. Use the offset distance that you measured earlier to work out where to position the square guide for each cut.



ROUTING THE DEEP SOCKET

11 The depth stop on the router needs to be set. With the router still unplugged, plunge the router down until the cutter's bottom edge just reaches the lower line previously scored with the marking gauge on the side of the wood. Power up the router and cut waste away from the deep main socket in the normal way as a series of deeper and deeper passes.

ROUTING THE END MORTISE

12 With the main socket shaped as a straight-sided rebate, it is time to undercut the mortise at the end of the joint. With the square guide moved back to its new position, the router is locked at full depth to slot out the lower half of the mortise.

13 I used one more pass of the router to make the upper half of the mortise. This time the plunge was locked at a height where the upper edge of the cutter met the upper scored gauge line. Depending on the dimensions of your cutter and joint, you may need more passes of the router at intermediate levels.

14 I turned the wood over to make the final router cut. This made a narrow rebate along the edge of the wood, forming the shoulder of the end tenon. When making cuts like this, extra care is needed to keep one side of the router sole flat on the face of the wood. It could easily wobble, resulting in a wavy edge.

15 I used a bandsaw to cut away the final shallower piece of waste because it is easier and more secure. It would be possible to rout it but because so much of the original face has now been cut away, you would need to set up extra supports to hold up the router sole.

FITTING WEDGES

16 All the cuts are now complete and it should be possible to test fit the joint together. Don't force it but if the joint is too tight, shave off the excess with a shoulder plane or chisel.

17 With both end tenons engaged in their mortise slots and pushed home, there will be a square or rectangular hole down the centre of the joint. Cut a piece of hardwood to a thickness matching the hole sideways but slightly oversize in both other dimensions.

18 Cut the small piece of hardwood diagonally to form a pair of triangular wedges. Even if the joint is made from softwood, I still suggest you use hardwood for the wedges so they won't compress or jam.

19 Drive the wedges into the hole in the middle of the joint, locking it securely together with one wedge from each side. You can use a mallet but I prefer to use a strong clamp to squeeze the wedges together, as it is more controllable. Finally, saw off the ends of the wedges flush with the sides and plane them.

Joints like this, made without glue, have a timeless appeal. If you are not convinced, there is no reason why you should not apply glue before assembly. You may want to practise this joint on some scrap to check the dimensions and methods before using it as part of a project. With careful measurement and cutting, the double tenon scarf joint is excellent for small, load-bearing construction, and also an attractive joint to look at!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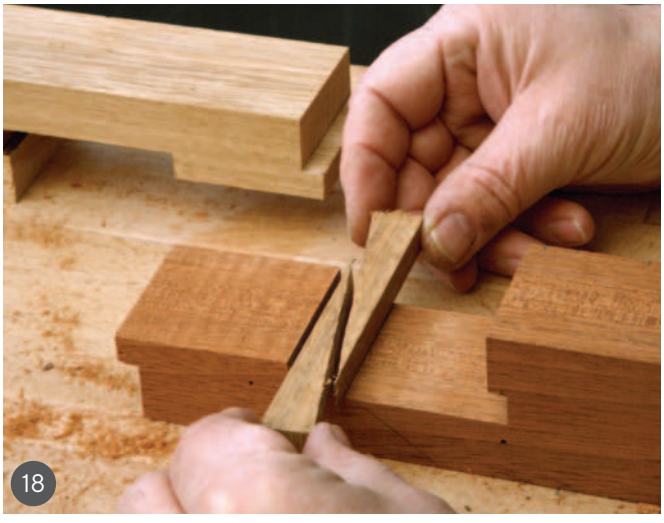
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THE FENLAND BLACK OAK PROJECT – THE CONTINUING STORY...

IN *F&C* 284 WE LOOKED AT A TRULY MINDBOGGLING PROJECT TO TURN PART OF A HUGE 5,000-YEAR-OLD BOG OAK TRUNK INTO A 'TABLE FOR THE NATION'. HAMISH LOW OF THE FENLAND TEAM TELLS US THE LATEST DEVELOPMENTS

The tree trunk in question, the 5,000-year-old Jubilee Oak discovered in 2012, has been described as 'a national treasure' due to its immense size and beauty imbued by its most fortunate state of preservation. Retrieving the trunk from the Fenland peat of Cambridgeshire, planking it on a specially imported oversize sawmill, then transporting it to the Building Crafts College in Stratford, East London, where it would go into a vast dehumidification kiln to dry out gently – all of this was just part of a long battle to turn it into the longest single board length table ever made. Read on to discover the next part of the story...

RAY FIGURE

One very, very cold Tuesday in January 2016 the design team and volunteers travelled up to the Fens and selected the four main planks that would be used for the table top. The plank selection was arguably the most important element of making the top, and most of the planks were quartersawn. A quartersawn plank has medullary figure, is more stable when dried and is far easier to dry successfully.

'We love this tree, it is such a perfect specimen. It just keeps on giving.'

Hamish Low, project director


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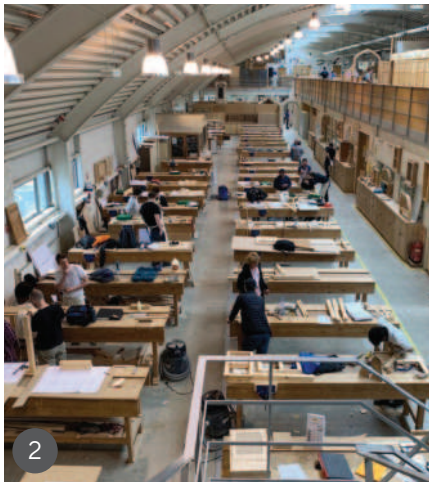
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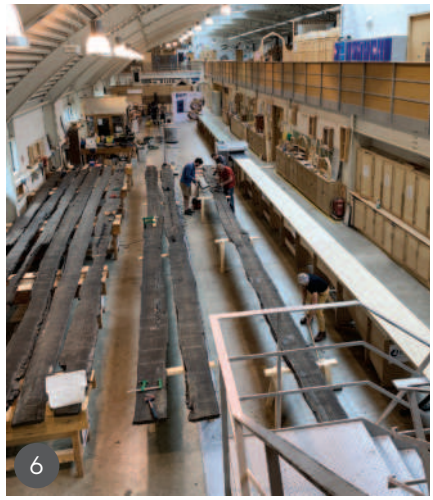
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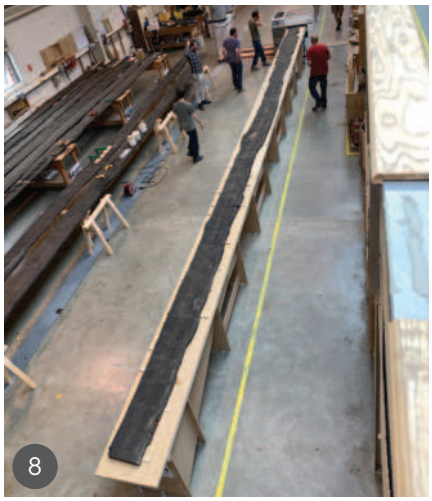
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PHOTOGRAPHS COURTESY OF THE FENLAND BLACK OAK PROJECT

1 The four main book-matched boards **2** The joinery shop at The Building Crafts College full of benches **3** The boards laid in order **4** Machining the wavy grooves **5** The wave-shaped laminated components inlaid across a split **6** Cautiously removing material from thicker areas of the board **7** Checking the board thickness as it comes out of the thicknesser **8** The first plank set up on the sled and packed with wedges **9** Mauro Dell'Orco designing the patches

LIKE A RIVER

An unexpected result of the saw milling event was a piece of design inspiration. We placed the first two planks that came off the sawmill side by side and it was immediately clear not only how beautiful the planks themselves were when book-matched and sat side by side, but also how graceful and 'river-like' the spaces were between them.

Rivers feature heavily in the Fens and played a significant role in the preservation of these ancient oak forests, so we decided, there and then, that we must develop techniques for joining these planks together while at the same time retaining their natural shapes. This method of jointing we decided to call 'the river joint' and this was to be the dominant factor when considering our plank selection.

BOOK-MATCHED PAIR

We were able to use a pair of book-matched quartersawn planks in the middle section with a full length central insert. The pair of central planks was wide enough to allow us to reduce the width of this central insert to almost nothing but still retain its full length. This in turn allowed us to use quite a defective plank for this insert as this was the only river joint to be glued to one or other of its neighbours.

On either side of this central section are the two outer planks specially selected for the integrity of their waney edges. These natural edges have been retained, but the flaky fragile bark, sap and cambium layer is burnished away using boxwood tools. Using cutting edge tools for this would have made it too easy to remove material, which would result in a contrived look.

WORKING SPACE

The joinery workshop at the BCC is a perfect size to fabricate the Jubilee Oak top as it is long enough to set up a 29m-long planer bed and long enough for us to work on two planks simultaneously. The workshop is normally full of rows of workbenches, so we had to first move them out of the way. We debated long and hard over the technique for flattening these planks but the very generous offer of a brand new state of the art thicknesser by SCM UK was a game changer.

THE LONGEST THICKNESSER BEDS EVER!

Mauro Dell'Orco took ownership of the thicknessing task and designed and built, in kit form, an in-feed and out-feed bed either side of the two scissor bed extensions. This was effectively a platform that had to be flat and true for over 25m and be able to travel up and down in unison with the scissor beds. It also had to be rigid and stable enough to enable us to push through a combined weight of 250kg, the weight of a Jubilee Oak plank and the sled it was attached to.

WALKING THE PLANK

We also had to make sure we could get the planks into the workshop when this huge planer was set up. They had to be brought in in the correct orientation to one another, as we could turn them over but it was impossible to turn them end for end without taking them outside and closing a road in East London!

DEALING WITH SPLITS

There was one large limb evident on the two central planks, which, as a result of the extreme forces put on it when the tree fell, had led to two very straight splits running down the centre of each plank. This split was at exactly 90° to the wide face and because the tree was so ridiculously straight, so was the split. We had to stabilise this split before we could plane the plank and we decided to embrace what would usually be considered a defect and make it a feature, inlaying wave-shaped laminated components from the underside.

There were several advantages in this technique. The component is very strong as the grain follows its shape, and it is is also very flexible. It's very quick to make and inlay, there is no cross-grained shrinkage issue and the wave shape is sympathetic to the 'river joint'.

A FLAT UNDERSIDE

The next stage was the most difficult, much more so than with normal native hardwoods. The task was establishing a flat surface on the underside of each plank. These planks were originally sawn at 69mm and at the end of the drying cycle were 35mm at their thinnest point. This is an extraordinary degree of shrinkage and I can only guess that it has something to do with the unprecedented degree of preservation. Fortunately they dried quite flat when considering this much shrinkage, but we still had to be very careful to retain as much of the thickness as possible.

We removed material, not from where it looked like we needed to, particularly if this happened to be a thin area, but by removing material from a thicker area that would help to reduce the twist. It took a lot of head scratching and a day just to establish a flat face on each plank, planing the high spots.

We turned the in-feed bed into a chalk bed, which identified high spots, and by measuring with long-reach callipers, we could identify where it was safe to remove material. This was repeated many times until we were satisfied there was enough of a datum for us to thickness the plank through the planer.

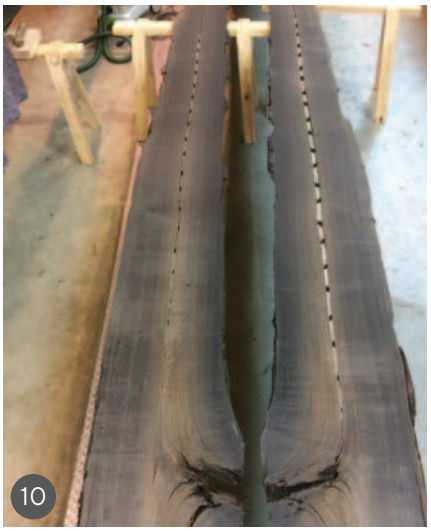
We had been waiting for seven years to find out what thickness we could achieve with these planks, as an accurate assessment was almost impossible. Until you start to manipulate the board you simply cannot tell how flexible it will be. The other important element was the necessity to have no stress in the board, particularly as the joints could not be glued together, so we had to lay the plank on to the chalk bed as if it was the under-structure of the table.

BIG THICKNESSING

Having established a hit and miss datum we set up each plank on a sled made up of 3.6 x 2.5m lengths of 18mm MDF, and by supporting the plank with wedges the whole lot was then passed through the machine. The machine is designed so that the pressure on both the in-feed and out-feed rollers can be adjusted, but we never imagined the machine would be able to pull through a total of 250kg of sled and black oak plank. The machine was very powerful and did so effortlessly, but it was also very accurate.

CAREFULLY PATCHED

Now that all the planks were planed smooth we were able to set them up together and see if there were any natural features



10 Before patching **11** After patching **12** Tracing the outline of each individual board **13** Mauro and Ricardo designing the river joint **14** Templates and tracings of the inserts **15** Gluing the inserts. The templates for the other inserts can be seen on the left **16** A full length template for the river joint clamped to the board as a majority of the waste material is being removed by a jigsaw **17** The first river joint **18** The level of accuracy to the river joint **19** The completed top, over 13 metres long and 5,000 years old **20** The making team – thank you!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that were too dominant and would need to be patched in order to reduce their visual impact. There was much to lose here, particularly when you consider the breathtaking visual impact of this top when viewed in its entirety. We also didn't want to draw attention to the patches, so very often they were book-matched knots and wherever possible selected from a sequential plank.

RIVER JOINTS

Having worked on each plank individually we now needed to join them all together to make one gigantic slab. There were unique challenges associated with the size of these planks, so we had to design a unique way of joining them. We called this the 'river joint'. This joint resolves some construction logistics but, more importantly, is very sympathetic to the unique shape and scale of the Jubilee Oak.

To turn these individual planks into one top, the outline of each board was traced on to an individual piece of tracing paper. We were then able to place each piece of tracing paper next to, and over the top of, each other so we could adjust the overall width and the shapes of the river joints.

TRACING AND TEMPLATES

This was also the way of retaining the integrity of the original shape of the tree. This technique with the tracing paper also enabled us to identify and adjust the areas where the planks didn't meet together. This involved adding shaped pieces to the width of some of the planks. These inserts were made by routing off templates, which were transferred from the tracing paper and the inserts were left over width.

The 'river joints' were also routed off templates and had to be cut very accurately, as of course these planks could not be glued together. The templates themselves had to be very long and this was done in a very direct way by placing six sheets of 2.5m-long 4mm HDF (High Density Fibreboard) end for end and the joints staggered with another 4mm sheet on top of that. The shape of the river joints was transferred from the tracing paper on to the templates by piercing with a point and joining up the dots.

ROUTED JOINTS

The first edge was then routed from the top face of the template. This plank and the one it's being jointed to were then both turned over and the other half of the next template was set up against the joint already cut. The template was then clamped to the second plank, the first plank removed and the second joint routed from the underside. This produced a staggeringly accurate joint which we then detailed with a chamfer.

Even though this joint looks very simple at first glance, there is actually a huge amount of detail to it when you look closely, and we had a great many doubts as to whether we could achieve this accurately over such a long joint. The river joint is a very important detail that can't be proven unless you actually do it.

We would like to thank all the students and staff at the BCC who embraced the project so wholeheartedly and who put up with us for a month. We could not have done it without you all.

BACK TO THE FENS

We wrapped up the boards in cardboard to be safely delivered back home to the Fens and stored away in the conditioning environment which we adapted from the original kiln. This environment is controlled by thermostats, humidistats and hygrometers, which enable us to regulate temperature and relative humidity. The air flow is controlled by proportional timers. The planks will be stored here while we raise the money to make an under structure worthy of the top.

This project is a charitable endeavour and relies entirely on the considerable expertise from individuals and companies who have embraced the challenge of trying to save this extraordinary example of Black Oak before others like it no longer emerge from the peat.

The fabrication of this table top simply wouldn't have been possible without SCM, Wealden Tool company Ltd, Festool and many others. The project team would also like to thank the heartwarming generosity and skill of all those individuals who made this top.

To find out how you can help complete this project please visit: **thefenlandblackoakproject.co.uk**.

PHOTOGRAPHS BY RANDALL A MAXEY

BUILDING A SHAKER-STYLE TABLE

RANDALL A MAXEY USES HAND TOOLS TO MAKE A SMALL CHERRY TABLE

I have always been attracted to the simple lines, basic elements and practical design of Shaker furniture. This style of furniture reflects the religious attitudes of the Shakers. An offshoot of the Quaker religion, the Shakers originated in northwest England in the 18th century. Many emigrated to North America in the late 1700s to establish self-sufficient communities.

The Shakers can be credited with many inventions, including the circular saw. They were advanced in their agricultural techniques and architectural design. They were also among the first to mass-produce furniture, particularly chairs.

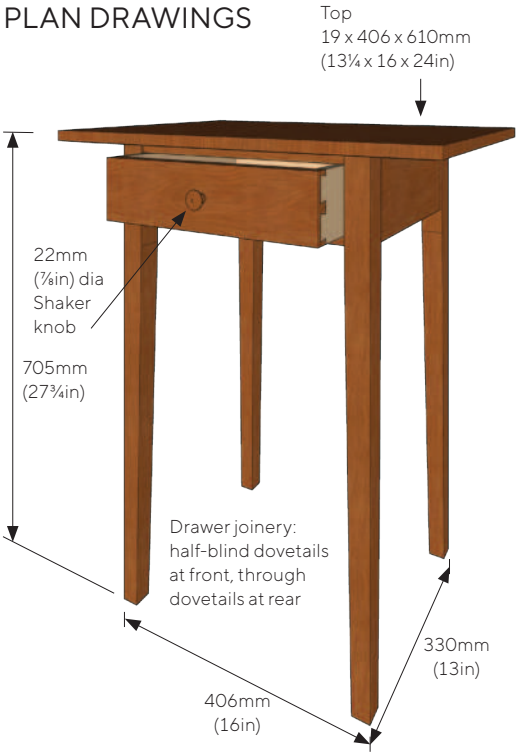
The style of table I made is of the type that might have been found in the bedroom of a Shaker home, but its small size makes it suitable for use as a side table in any room.

HYBRID CONSTRUCTION

One of the main reasons I like Shaker-style furniture is that it lends itself well to the use of hand tools. I prefer to use hand tools when I can, as I enjoy the quiet, systematic approach and the results I obtain with them.

For this project, however, I used a combination of power tools and hand tools. For example, all the parts were milled using a powered thickness planer, jointer and tablesaw. I used my tenon saw for cutting the tenons by hand, but I recommend that you cut yours in the way you usually would. The mortises in the legs were drilled out at the drill press and cleaned up by hand with bench chisels. The tapers on the legs were cut at the bandsaw but finished with a hand plane. The bevels at the edges of the table

PLAN DRAWINGS



Drawer front: (19 x 89 x 337mm) (¾ x 3½ x 13¼in)

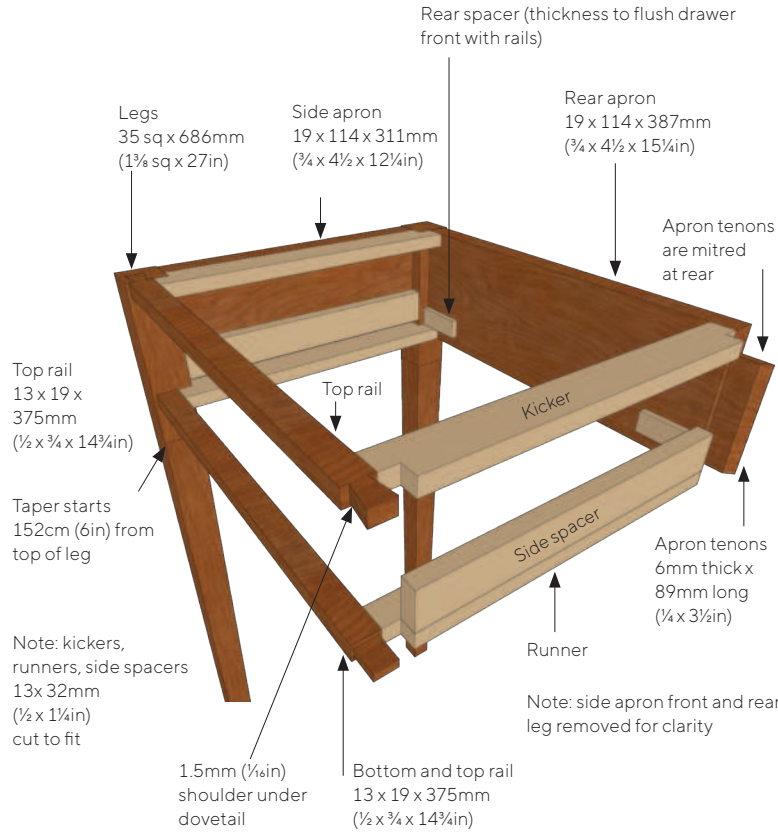
Drawer sides: 13 x 89 x 292mm (½ x 3½ x 11½in)

Drawer back: 13 x 75 x 337mm (½ x 2 15/16 x 13¼in)

6mm (¼in) plywood drawer bottom fits in 6mm (¼in) deep groove in drawer sides and front

Optional: bevel bottom edge of top with 3 x 19mm (⅛ x ¾in) bevel

Note: size drawer front and back to fit opening



top were formed with hand planes. The dovetails used for drawer construction were cut using hand tools. All parts were surfaced with a smoothing plane before assembly. The tools and methods you use will depend on the tools you have at your disposal and your comfort level with using them.

THE LEGS

The Shakers would have used native hardwoods available in their communities. I chose to use cherry for the main components and maple for the internal drawer parts.

I began by laying out the location of each mortise and taper on the leg blanks. I like to cut the mortises while the blank is still square, so that's where I started. A ¼in brad-point or Forstner bit makes quick work of removing the waste from the mortises. Set the depth stop on your drill press to drill the depth of the mortise. As you drill, lift the bit periodically to remove chips and prevent burning.

To maintain drilling in a straight line for a smooth mortise, use a fence clamped to the drill press table to align the bit with the centreline of the mortise. This makes the task of drilling repetitive mortises much easier and more accurate.

I start by drilling out each end of the mortise and then drilling out between them to remove most of the waste. Then you can go back to the workbench and square up the mortises using bench chisels. Aim for smooth walls that are square to the face of the leg.

I like to use a bandsaw to cut the tapers on the legs. You can also use a tapering jig on the tablesaw. At the bandsaw, I start at the top of the taper and cut towards the bottom of the leg. Stay just outside the pencil line and keep the cut as straight as possible. Save the cutoff and tape it back to the leg blank to create a flat surface for cutting the adjacent taper.

With all the tapers cut, you can clamp the legs together on top of the workbench and use a hand plane to smooth the tapers. Avoid going past the transition line where the taper starts at the top of the leg. Work the high spots first, then gradually make longer strokes with the plane until you can make one long, final pass the entire length of the taper. Marking the taper with pencil lines will help you gauge your progress.

A final pass with a smoothing plane over all the faces of the legs removes any mill marks left from the saw, jointer or planer. It leaves a glass-smooth surface ready for assembly.

Before moving on, remove the sharp edges and corners of the legs with a block plane. It just takes a few passes. Also, form a

1 Clamp a fence to the drill press table to centre the mortise under the drill bit. Drill out both ends first and then work down the length of the mortise **2** After squaring up the mortises with chisels, you're ready to form the tapers **3** Ganging all the legs together provides more bearing surface for the hand plane and helps keep all of the tapers consistent **4** A hand plane is the perfect tool for creating straight, smooth surfaces **5** A small block plane is ideal for easing all of the sharp corners **6** The tenon saw can be used to cut the shoulders on the tenons of all the aprons and rails

small chamfer around the bottom of each leg. This helps prevent chipping and tear-out if the table is slid across the floor.

APRONS AND RAILS

There are two side aprons and a back apron. The two rails at the front form the drawer opening.

After cutting the aprons to final size, accounting for the length of the tenons, I cut the shoulders of the tenons. Ensure the location of the shoulders of all the tenons is consistent on all three aprons. Following this, cut the short cheeks of the tenon. I prefer to use the bandsaw to cut the long cheeks of the tenons. Set the location of the bandsaw fence so that the waste falls to the outside of the blade.Having cut the tenon shoulders, the tenon saw kerf provides a definitive stopping point when cutting the cheeks.

At the back corners of the table, the tenons need to be mitred. I made a guide block for my block plane using a thick piece of hardwood cut at a 45° angle.

The front top rail is attached to the front legs using a half-blind dovetail joint. Cut the dovetail on each end of the rail and then use that to trace the outline of the socket at the top of each front leg. Scribe the depth of the socket with a marking gauge. You can drill out most of the waste in the sockets at the drill press and clean them up with bench chisels. Form tenons on the bottom rail to fit into the front legs.

At this point, you can dry-assemble the legs, aprons and rails, making sure the assembly is square and that the shoulders of the tenons fit tight to the legs. After making final adjustments, you can add glue and clamps. I like to glue up the two side legs and aprons as separate assemblies. Then, after the glue dries, connect those two assemblies with the back apron and two front rails.

DRAWER CONSTRUCTION

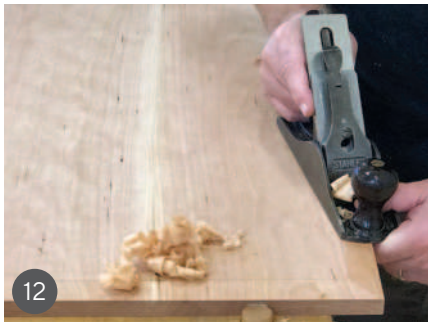
When building an inset drawer, I cut the drawer front to the same size as the opening. Then I use a hand plane to home in on the final fit with an even gap all around. Once I'm happy with the fit, I use the drawer front as a gauge to cut the drawer back to the same size and the drawer sides to the same width as the front.

For my drawer, I used a pair of dovetails at each corner for the joinery. You can lay out as many as you like. The drawer sides are joined to the front with half-blind dovetails and at the back with through dovetails. Labelling the workpieces, their orientation and joint placement ahead of time will save frustration later.

I used a mirror-image layout of the dovetails at each end of the drawer sides. You can cut these by hand or at the bandsaw and then remove the waste with chisels.

Use the dovetails to scribe the sockets on the drawer front and back. Pay attention to the orientation of the workpieces as you do this. Scribe the baseline of the sockets using a marking gauge. Carefully make saw cuts then clean out the waste with chisels.

I cut and test-fitted all the joinery first. Then I cut the groove for the drawer bottom at the tablesaw. Now would be a good



7 A bandsaw with a 12mm-wide blade makes quick work of cutting the tenon cheeks **8** Use a mitred guide block with a block plane to form a mitre on the aprons. Only the back corners of the table have mitred tenons **9** Use the dovetail on the top rail to scribe the outline of the socket on the top of the front legs **10** Half-blind dovetails connect the drawer sides to the front. Through dovetails are used for the back of the drawer **11** When gluing the runners, kickers and side spacers to the side aprons use the completed drawer as a guide to ensure a smooth sliding action **12** Use a hand plane to form a slight bevel on the underside of the top. Start with the end-grain edges first

time to drill the mounting hole for the drawer knob in the drawer front. Finally, you can trim the drawer back to final width so that the plywood drawer bottom can be fastened to it with a screw. Don't glue the drawer bottom in place.

After gluing up the drawer, ensure it is square by measuring diagonally across the corners. The measurements should match.

FINAL DETAILS

The kickers and runners for the drawer are cut to fit between the front and back legs. It's important to make sure they fit tight against the inside of the aprons since they'll be held in place with glue. Before attaching the kickers, drill countersunk, oversized screw holes. These will allow the top to expand and contract across its width with changes in humidity.

While test-fitting the runners and kickers, I use the drawer as a gauge to ensure that the drawer face aligns and is flush with the front rails. As a matter of fact, I temporarily clamp the drawer in place as I glue and clamp these parts in place. You just need to make sure the drawer will still be able to slide freely once the glue dries.

Check the fit of the drawer in the opening and use a small block plane to trim away any areas that are rubbing and preventing smooth opening and closing of the drawer. You may need to add a pair of spacers at the back corners of the drawer to keep the drawer front flush with the rails when closed.

I turned a simple mushroom-shaped drawer knob on the lathe. You could purchase a knob online or from a local craft store. After gluing the knob in place you can concentrate on the table top.

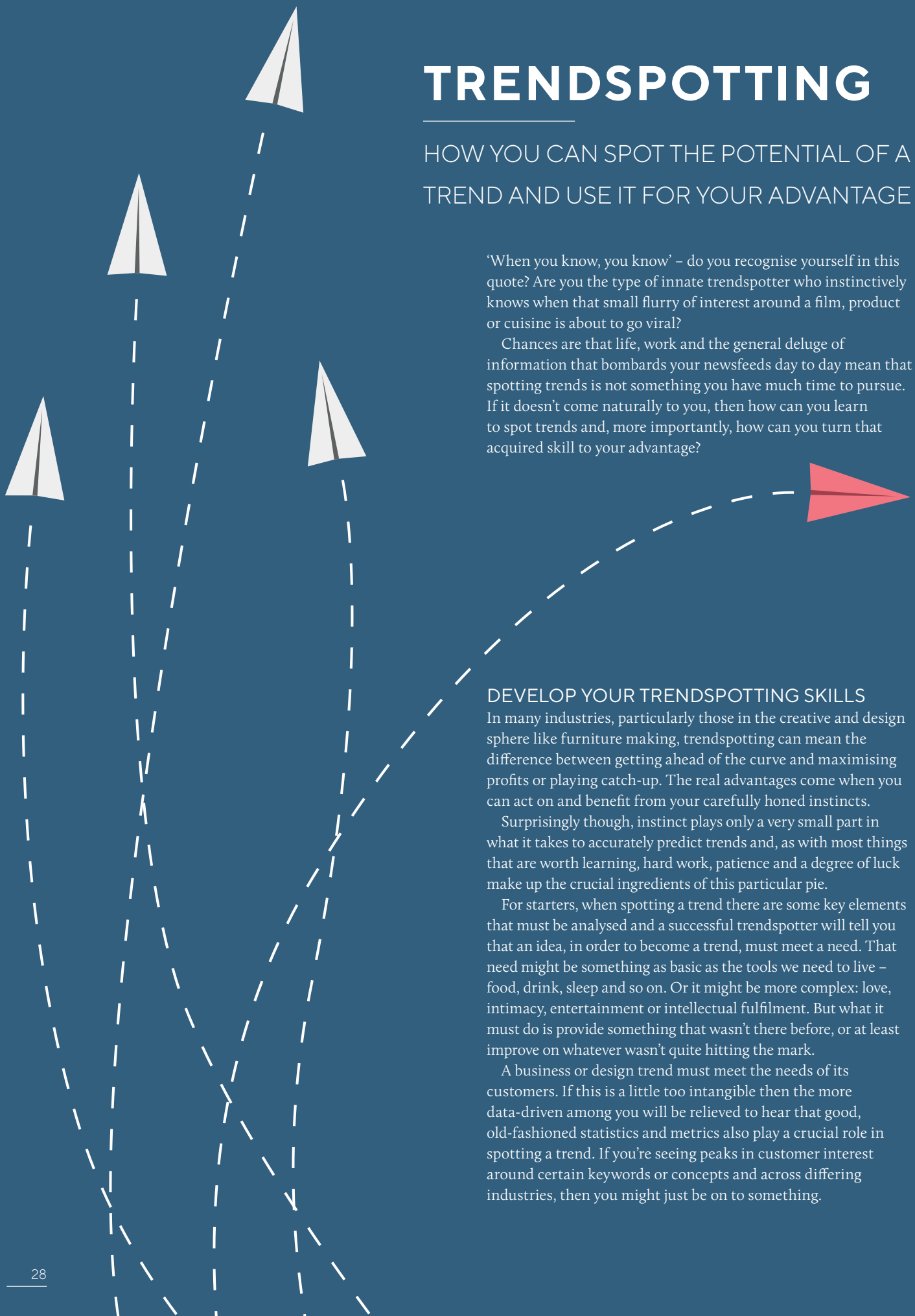
You'll likely need to glue up the top from two or more pieces to obtain the required width. After cutting it to final size, I formed a slight bevel on the underside of all the edges using a hand plane. I find it rewarding to form the bevel by hand.

I drew pencil lines to define the width and depth of the bevel. These serve as visual guidelines as you plane. Start by tilting the hand plane to the approximate angle of the bevel and start making long strokes along the entire length of the edge. You'll want to start with the end grain first. This way, if there is any tear-out as the plane exits the cut, it will be cleaned up when you plane the long grain.

Keep an eye on your guidelines as you plane. The shavings will get wider as you approach the final width of the bevel. As you start planing the adjacent edges, you'll notice a mitre line starting to form where the two bevels meet. This serves as another guide for you when planing. The end goal is to have the bevels the same width and depth with the mitre lines meeting at the outside corners of the top.

Fasten the top to the base with screws through the kickers. Check that the screw heads don't interfere with the operation of the drawer.

After sanding by hand up through 220 grit, I applied an oil and wax finish. I set the table near a window so that it would be exposed to the bright sunlight. This darkens the cherry to a rich, burgundy colour.



TRENDSPOTTING

HOW YOU CAN SPOT THE POTENTIAL OF A TREND AND USE IT FOR YOUR ADVANTAGE

'When you know, you know' – do you recognise yourself in this quote? Are you the type of innate trendspotter who instinctively knows when that small flurry of interest around a film, product or cuisine is about to go viral?

Chances are that life, work and the general deluge of information that bombards your newsfeeds day to day mean that spotting trends is not something you have much time to pursue. If it doesn't come naturally to you, then how can you learn to spot trends and, more importantly, how can you turn that acquired skill to your advantage?

DEVELOP YOUR TRENDSPOTTING SKILLS

In many industries, particularly those in the creative and design sphere like furniture making, trendspotting can mean the difference between getting ahead of the curve and maximising profits or playing catch-up. The real advantages come when you can act on and benefit from your carefully honed instincts.

Surprisingly though, instinct plays only a very small part in what it takes to accurately predict trends and, as with most things that are worth learning, hard work, patience and a degree of luck make up the crucial ingredients of this particular pie.

For starters, when spotting a trend there are some key elements that must be analysed and a successful trendspotter will tell you that an idea, in order to become a trend, must meet a need. That need might be something as basic as the tools we need to live – food, drink, sleep and so on. Or it might be more complex: love, intimacy, entertainment or intellectual fulfilment. But what it must do is provide something that wasn't there before, or at least improve on whatever wasn't quite hitting the mark.

A business or design trend must meet the needs of its customers. If this is a little too intangible then the more data-driven among you will be relieved to hear that good, old-fashioned statistics and metrics also play a crucial role in spotting a trend. If you're seeing peaks in customer interest around certain keywords or concepts and across differing industries, then you might just be on to something.

PHOTOGRAPH: NATTAPOL_SRITONGCOM/SHUTTERSTOCK.COM

Take for example, artificial intelligence. Even as little as two years ago AI was still considered an emerging technology for small businesses. Yet customers' experiences were noticeably enhanced and improved when AI was present for functions such as online shopping. Not simply automated actions but rather smart, learning AI that uses a customer's location to create offers and delivery solutions that are practical and enticing, alongside other learned tasks that only the smartest of technology can offer.

The forward-thinking business owner, using the fact that this is indeed meeting a need and seeing it used across different industries, might explore some business solutions around this trend for better business practice and customer engagement.

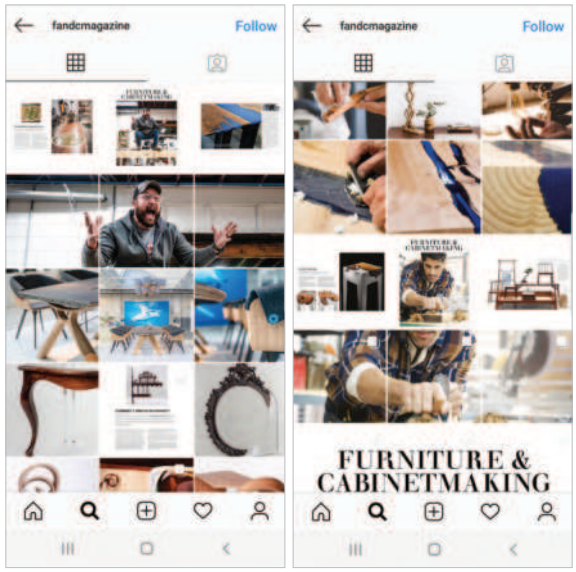
Trendspotting can be time-consuming, so let others do some of the hard work for you by signing up to websites that specialise in exactly this kind of deep analysis. Read everything you can about the furniture industry and stay on top of news and developments.

While you might find yourself beginning to spot trends through this kind of information gathering and through analysing your own website and social media data, there is the danger that you may jump on something that doesn't fit your goals or brand identity. In short, not all trends are created equal and the bandwagon isn't always appropriate to jump on. Instead, when spotting trends, ask yourself how they might benefit you and your furniture-making business specifically. Are they worth investing time and money in and will you see real life profit from these actions?

Take time too, to look at what the competition is up to. What are they championing and pushing? Are these products or services being talked about on social media, outside their own efforts? Are they popping up on other sites or across other industries? Use this analysis to inform some of your own marketing.

When you're in business, so much of your time is spent being a jack-of-all-trades and spotting trends might seem like one more drain on your time and money, but this is a skill well worth your efforts. Getting ahead of the curve when it comes to technology or knowing which of your products is going to take off over the next 12 months, that's golden.

'Spotting trends might seem like one more drain on your time and money, but this is a skill well worth your efforts. Getting ahead of the curve when it comes to technology or knowing which of your products is going to take off over the next 12 months, that's golden.'



TRENDSPOTTING RESOURCES

- Use social media such as Instagram to research what's new and what's popular. Look for trending hashtags and follow furniture makers whose work intrigues you.
- Follow design and interiors blogs such as Design Milk, Apartment Therapy and Dezeen. These will give you an insight into what's happening across the creative industries.
- Stay up to date with trade fairs and design festivals such as Salone Del Mobile Milano, Celebration of Craftsmanship and Design, New Designers and the London Design Festival. If you can't attend in person, spend some time browsing their websites and social media to discover what's being exhibited and discussed in seminars.
- And of course, *Furniture & Cabinetmaking* will always keep you up to date with what's happening in the furniture world!

PHOTOGRAPH: BENEDETTO FIORI/SHUTTERSTOCK.COM

MADE TO LAST

AN INHERITED LOVE OF CARPENTRY HAS INSPIRED A BUSINESS CREATING HERITAGE FURNITURE DESIGNED TO LAST THROUGH GENERATIONS

The strapline for Nic Santos's Atlanta, Georgia-based Woodbee Woodworks is: 'Handmade to be handed down'. His custom-built, mid-century modern-inspired classic furniture designs are made to last using traditional methods he has been learning since his boyhood.

Nic's dad was a carpenter working in the home renovation industry, and Nic first learned to work with tools helping his father out. 'I was always borrowing his tools and building things such as tables and chairs for myself and friends,' he recalls.

At the age of 23 he got his first job in a woodworking business in Athens, Georgia. 'I soon realised that this was what I wanted to do,' he says. 'A year and a half later I started my own small business, Woodbee Woodworks, that has been operating now for five years.'

It didn't start off quite as smoothly as hoped though – Nic's first major project was to create 26 heart pine table tops for a chain of restaurants the country band Rascal Flatts was planning to open across the US. But the chain was pulled before it ever opened because of financial problems largely caused by the involvement of a former New York mobster, exposed by an Arizona newspaper. 'Apparently the entire project was shut down due to mafia ties,' says Nic, 'but luckily I was paid upfront.'

ONE-MAN BAND

Nic is largely self-taught, learning his trade from books, forums, magazines and YouTube videos – 'really anything woodworking related I could get my hands on', he says. To start out he spent his savings on essential tools and began with small projects such as cutting boards, rolling pins, stools and nightstands, which he sold at a local artists' market and online through craft marketplace Etsy. Right now he is still a one-man band – just him and his shop dog, Nori. But he says: 'My workload has been growing over the past few years and keeping me occupied for a few months in advance. Soon I'll be looking to add a part-time employee or intern to help.'

Nic works with a wide variety of exotic and domestic woods, but his most commonly used, in that order, are walnut, white oak and ash. Around two-thirds of his work is done by machine, but depending on the project there could be a lot more hand work. 'My Delmar bookshelf is almost entirely done by hand. The entire frame of the bookshelf is hand-shaped with a series of files, rasps and spokeshaves,' he says. When designing he mainly works from sketches, drawings or inspiration images from clients, although he has created the odd model. Finishing depends on the look of the individual piece or client needs, but he mainly uses hard wax oil Osmo. 'It is relatively easy to apply and gives the wood a more natural look, as opposed to a shellac or polyurethane finish that can give the wood a more plastic look and feel,' Nic explains.

Word of mouth is spreading about Nic's business and he is getting more and more work in his local area, which is great because he finds that shipping is the most stressful element of the whole job. 'I would say at least 50% of my business is local, and the rest is shipped all over the country,' he says. He believes his mid-century-inspired style attracts a broad audience of men and women across all age groups. 'People are attracted to the aesthetically pleasing clean lines and smooth curves generally found in mid-century design,' he says.

MEETING CHALLENGES

So what is the most difficult project he has worked on? 'The Maloof Low Back Arm Chair was the piece I personally found to be most difficult, because there aren't any right angles on this chair,' says Nic. 'Each joint is a compound angle, and nothing comes together at 90°. This piece also involves a lot of hand-shaping and sculpting, which can be very difficult, but is something I really enjoy.'


WOODBEE
WOODWORKS

His favourite piece was the Strega record cabinet. 'This piece gave me the opportunity to step outside what I would normally do and design something a little different than the rest of my pieces. I was able to try out sliding doors for the first time, which was something I had wanted to try for some time. It also features some exposed joinery on the base and cabinet carcass, which is always a fun challenge for me.'

Nic has also been working on designs which show off the natural shapes and grains of wood. 'Live edge furniture has become increasingly popular over the past several years and I find myself making a lot of live edge tables, benches and mirrors,' he says. 'I spend a lot of time selecting the perfect materials for each job and do my best to highlight the most unique aspects of each piece. What many people might see as imperfection in a slab of wood is something I actually look for – large checks or cracks, voids made by rot, spalting or knots are all unique characteristics I look for when selecting a slab.'

His current project is making two large coffee tables out of more than 400lbs of petrified wood for a local design firm in Atlanta. 'I've never worked with petrified wood before, so it's something I'm looking forward to,' he says. Going forward his top priority is to move into a larger workshop. 'I'm currently working out of an oversized two-car garage that makes working on larger projects, such as 10ft tables, very difficult.

'My goal is to move into higher end furniture, something I can spend months designing and perfecting. In comparison to a lot of woodworkers, I'm still relatively green, but I've learned a tremendous amount in a short period of time and I contribute a lot of that to my obsession with my craft. I wake up excited to get to work every morning and continue to learn and elevate my work.'

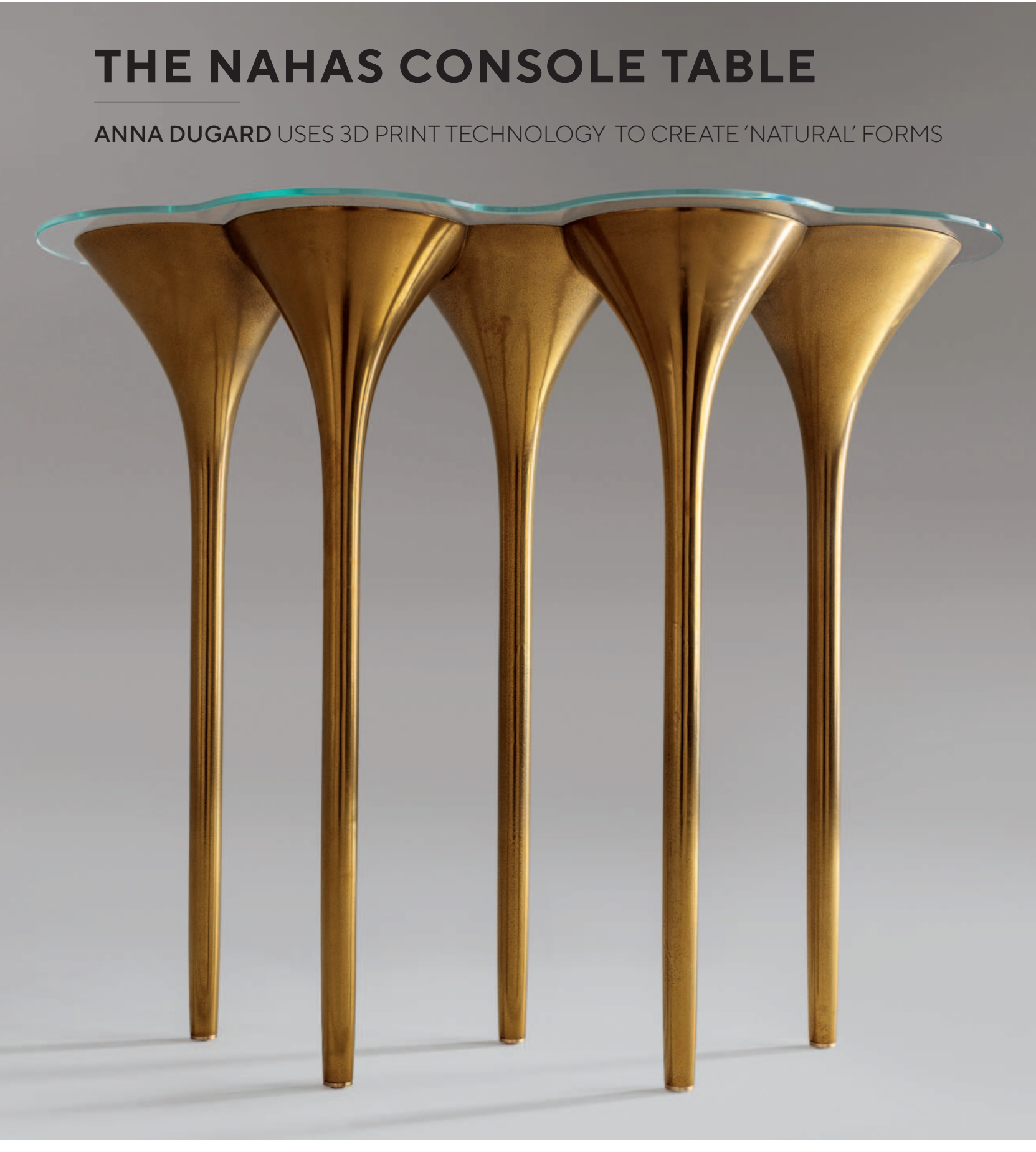
woodbeewoodworks.com

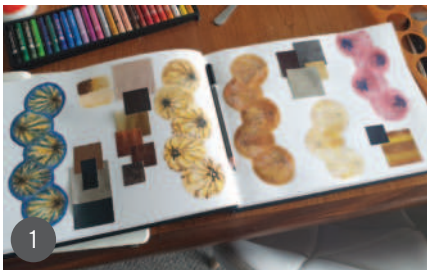
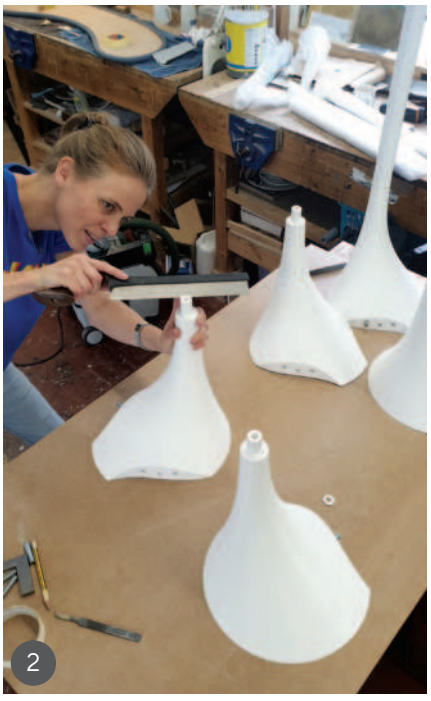
WORDS: CHRISTINE BOGGIS


CHECKLIST
Running with Scissors
MARIETTE IN ECSTASY

THE NAHAS CONSOLE TABLE

ANNA DUGARD USES 3D PRINT TECHNOLOGY TO CREATE 'NATURAL' FORMS





MAIN PHOTOGRAPH BY SIMON ELDON; STEP PHOTOGRAPHS BY ANNA DUGARD

1 The initial concept ideas were all hand drawn **2** The 3D forms being shaped to fit together, note the dowel holes
3 The complete 'dry' assembly carefully aligned **4** Metal dowels in place and an unfinished interior
5 The legs mounted for spray coating **6** The leg components secured to a flat board while they are glued together with epoxy

The Nahas console table was made using the rapidly developing process of 3D printing, which offers the ability to create complex forms with a very efficient use of materials. The design of Nahas was inspired by the growth of natural forms – the fluted legs echo flower stems and the textured trumpets resemble long-necked flowers. The brass finish will age over time, adding character and also providing the name Nahas, meaning brass in Arabic.

3D AND CNC DESIGN

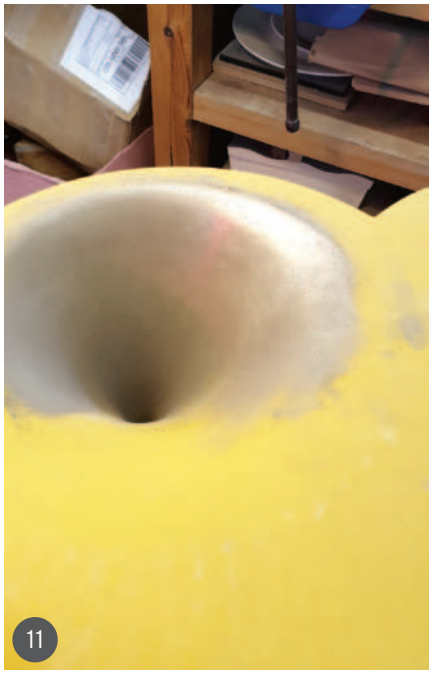
I recently graduated from a 50-week design and make course at Robinson House Studio Furniture School (RHS) in East Sussex. I enjoyed the traditional woodworking skills but came into my element once I had the creative freedom to work with mixed materials and experiment with new processes. With access to 3D printing for prototyping and a CNC machine, I was keen to use these facilities for my first project.

Before my time at RHS I worked for a retail design agency in Dubai, and maybe that's what inspired the brass finish and Arabic name of the table. With an undergraduate degree in product design and a keen interest in design and engineering, I now want to pursue a more hands-on career in furniture.

A EUREKA MOMENT

After a weekend spent doing all the available Fusion 360 3D CAD tutorials, I set-to and started translating my vision for this piece into CAD, printing prototypes at the studio until the design was refined. My initial intention was to CNC the console table out of high-density model board. However, after early testing on the CNC machine it became apparent that this was not a viable way to make the table. Then I had a eureka moment! Why not have the table 3D printed in full size?

The technology is available to 3D print the table as a single component, but as a student making my first piece of furniture the cost was prohibitive. Using smaller printers and splitting the design into multiple components made the project viable. The design was split into 10 components and printed by a UK manufacturer in biodegradable plastic. Interlocking fittings allowed easy assembly of the parts and stainless steel rods were used to reinforce the legs. The rough surface of the 3D print



7 The turned brass fit, which will be attached later **8** Progress so far, all bonded together ready for the next stage
9 The deep cone shape in each leg component **10** The tops of the cones coated with metallised paint which is being rubbed back
11 The brass effect starts to appear as if by magic **12** Now for the legs – a respirator is essential because of the metal dust generated

and the fabrication joins had to be smoothed using abrasives, body filler and self-levelling resin and then primed before the finish could be applied.

BRASSED ON

The brass finish is essentially a paint packed with metal particles of copper and zinc. It is applied to the surface, allowed to cure and then cut back and polished. I applied the brass paint to the legs using a spray gun. Working with such an innovative product on the complex form presented challenges. With little working knowledge of this expensive product, after a few test sprays I had to bite the brass bullet and spray the table. In order to achieve a consistent finish, the table needed to be sprayed in one session. Too little paint, and there is not enough material to cut back and polish, too much and it will run because of the weight of the brass. The first spray of the table did not go to plan, so I decided

13 Metallic shine versus base yellow paint **14** Now very shiny, the more you rub the higher the shine
15 The turned brass feet with hex head for adjusting them **16** An amazing texture created on the top surfaces
17 A very unique finish can be created by careful paint application

to sand the paint back to the primer and try again – a costly decision in terms of time and material, but a necessary one. The subsequent spray was much better, allowing for the brass paint to be polished to a consistent high shine finish.

'THAT MOLTEN MAGMA LOOK'

I envisaged the trumpets having a more naturalistic, textured finish. After experimenting with different methods of applying the brass paint I was confident that a molten magma look could be achieved, a finish I had not seen before.

The table sits on adjustable solid brass feet. I turned these and fabricated them with stainless steel threaded bar to allow for adjustment. An organic formed profile of CNC'd glass creates the table top and echoes the form of the table. This was drawn in CAD and subcontracted to a specialist glass manufacturer to achieve the unique form with a polished edge.

THE FINAL OUTCOME

The design and build of the Nahas console table took 15 weeks and used 5.8kg of biodegradable plastic and 5kg of metal paint. I couldn't be happier with the piece and it has fulfilled my design vision entirely. As a first project it was ambitious, but it's my nature to push boundaries and my own abilities.

FUTURE SPACE

I'm writing this a month after finishing my studies, so what's next? I am setting up a workshop in a garage space that has been lent to me, developing my metal working skills with a local fabricator and helping out at Robinson House Studio, which is moving to new state-of-the-art premises. I've had a great response to the console table, and hope my recently completed Dawn Wall drinks cabinet, made in pear with Lycra upholstered doors, will be similarly well received. I am excited to see what the future has in store for me and am ready for the challenges ahead.

I am approaching my new career with an open mind, and would love to hear about any opportunities, collaborations or commissions. My latest work can be found on Instagram. Don't be a stranger, say hi!

Instagram: @AnnaDugard

PHOTOGRAPH BY MAREK OLBRZYMEK/COURTESY OF TREE OF THE YEAR

EUROPEAN TREE OF THE YEAR 2020

THE CZECH REPUBLIC'S **'GUARDIAN OF THE FLOODED VILLAGE'** WINS THE 2020 TITLE

The prestigious title of the European Tree of the Year is heading to the Czech Republic for 2020. The pine tree known as the 'Guardian of the Flooded Village' left its rivals far behind in the public vote to take first place. The silver medal went to Croatia's 'Gingko from Daruvar', while Russia's 'Lonely Poplar' was close behind in third place. The UK's finalist, the 'Allerton Oak' in Liverpool's Calderstones Park, came seventh.

The 350-year-old 'Guardian of the Flooded Village' grows on the rocky headland of a dam. Its story relates to the village of Chudobín, which was flooded after the construction of a dam. According to a local legend, a devil sat under the pine in the night and played the violin. However, it is much more likely that the local people were hearing the strong winds blowing over the valley. This pine tree is not only an important local landmark but also an impressive testament to nature's resistance to climate change and human impact.

The announcement of the results, which traditionally takes place in the European Parliament in Brussels, went online this year due to the Coronavirus crisis and the subsequent closure of European borders. 'We wondered how to convey the joy of the results to 16 European communities. Finally, we combined the tree stories and personal testimonies of the first three finalists into a video that can now be watched and shared among tree fans across borders,' says Josef Jary from the Environmental Partnership Association, which organises the Tree of the Year competition.

The contest was organised by the Environmental Partnership Association and the European Landowners' Organisation under the auspices of MEPs Ludek Niedermayer and Michal Wiezik.

treeoftheyear.org.

PHOTOGRAPH BY PUBLIC INSTITUTION FOR THE MANAGEMENT OF PROTECTED AREAS OF NATURE IN THE COUNTY OF BJELOVAR-BILOGORA/COURTESY OF TREE OF THE YEAR

OPPOSITE: The 'Guardian of the Flooded Village' from the Czech Republic won the public vote and is the European Tree of the Year for 2020

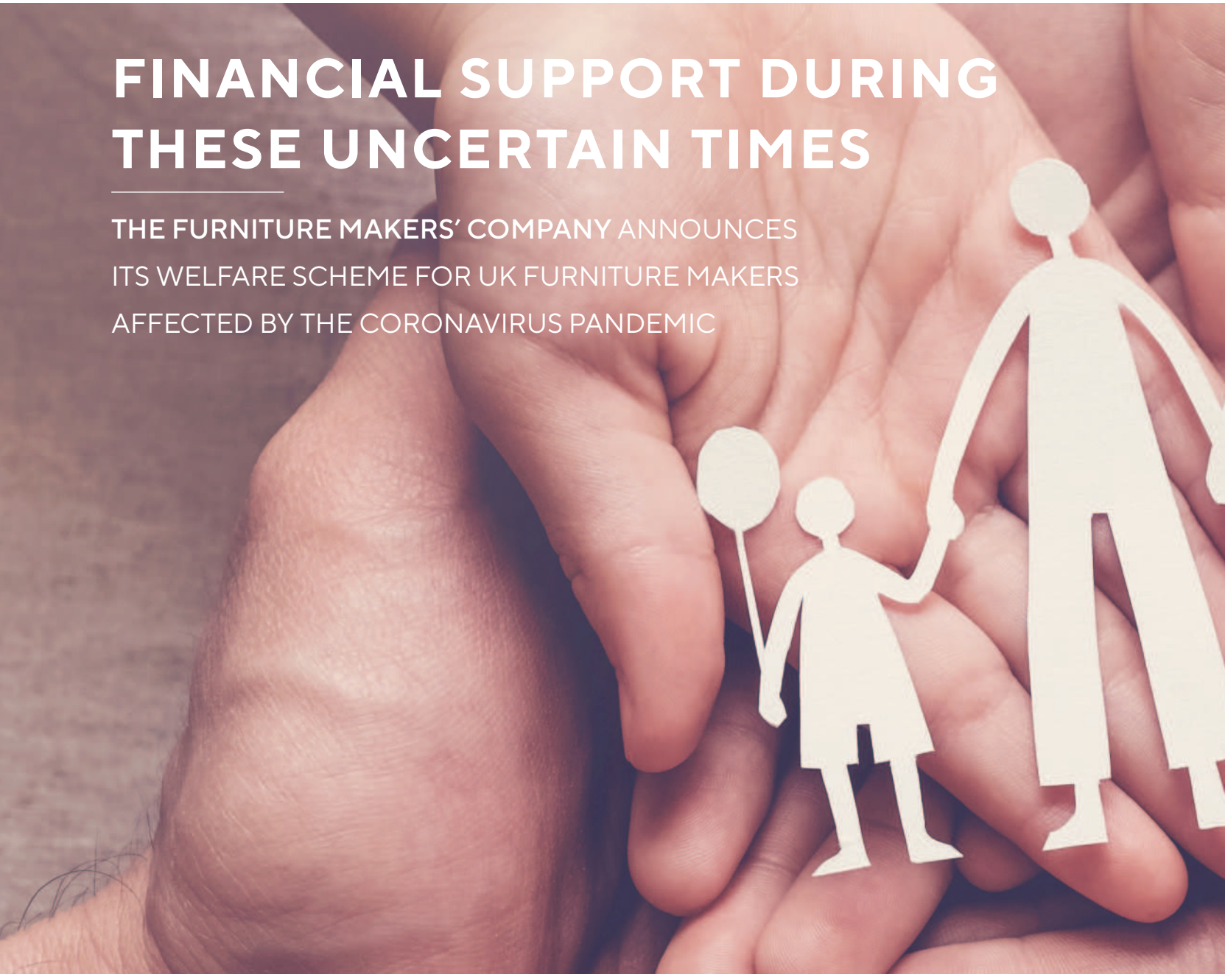
LEFT: Croatia's 'Gingko from Daruvar' took second place

PHOTOGRAPH BY NIKOLAY BOSHEV/COURTESY OF TREE OF THE YEAR

Russia's 'Lonely Poplar' finished third

PHOTOGRAPH BY JILL JENNINGS/COURTESY OF TREE OF THE YEAR

The 'Allerton Oak' in Liverpool was voted into seventh place



FINANCIAL SUPPORT DURING THESE UNCERTAIN TIMES

THE FURNITURE MAKERS' COMPANY ANNOUNCES ITS WELFARE SCHEME FOR UK FURNITURE MAKERS AFFECTED BY THE CORONAVIRUS PANDEMIC

The Furniture Makers' Company, the City of London livery company and charity for the furnishing industry, is urging people who work in the UK furnishing industry – whether employed or self-employed – to enquire about an emergency grant if they are struggling to cover their monthly outgoings.

With companies around the UK having shut their doors to slow the outbreak of Coronavirus, many workers from all sectors have been furloughed or sadly made redundant. Meanwhile, the self-employed have seen work instantly dry up with scheduled jobs cancelled or put on hold.

Government schemes have been implemented to support workers during these uncertain times, but any delay in payments being received could cause a personal crisis for the claimant during an already stressful time.

The Furniture Makers' Company has been supporting industry workers, past and present, since 1903, and it wants the readers of *F&C* to know that the team is on hand to support anyone affected or financially impacted.

In response to the pandemic, the charity has released an interactive welfare brochure outlining the emergency support it can provide.

The six-page interactive brochure features links to government advice, questions to ask your employer during this uncertain time, information on the financial help the charity provides, frequently asked questions and a link to the application form.

Dids Macdonald OBE, Master of The Furniture Makers' Company, says: 'Never in the 100-year history of the charity, apart from two world wars, has our industry and country

PHOTOGRAPH: SEWCREAM/SHUTTERSTOCK.COM

faced such an extraordinary and unprecedented need for welfare support.

'Reacting to the pandemic, we have created an interactive brochure that outlines the financial support that is available to furnishing industry workers. Please take a look at it and share it with co-workers, employees or your HR department so they can share it with everyone who works at your business.'

The charity has already helped lots of other people with a grant, like Joe.

Joe is a self-employed furniture maker whose usually thriving business has seen a significant fall in sales due to the recent pandemic.

He came across The Furniture Makers' Company on the Turn2Us website and applied for a £500 self-employed grant.

He has been struggling to pay for bills and food so had to survive on food banks, tax credits and housing benefits. The charity reviewed his application and issued him a grant, hoping that this could bring a little relief.

To access the interactive welfare brochure, go to:
https://bit.ly/COVID19FMCsupport

The Furniture Makers' Company
the furnishing industry's charity

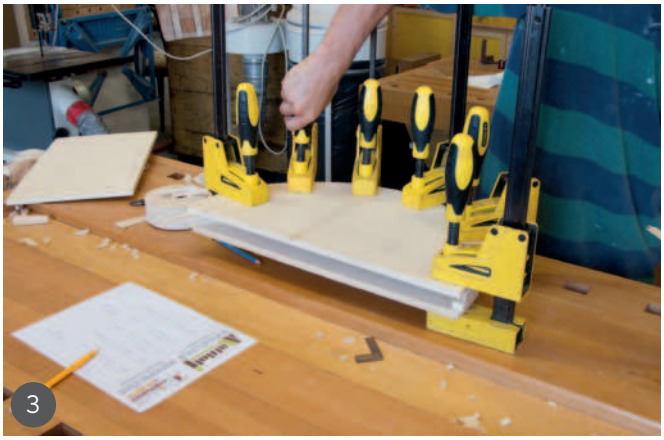
CURVED LAMP

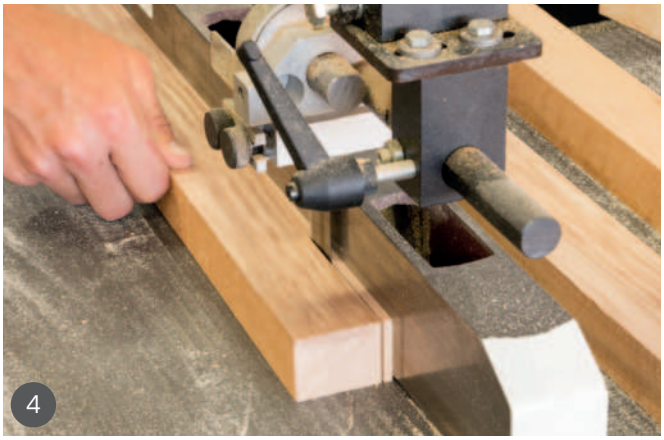
A BRIGHT IDEA FROM PROMISING YOUNG STUDENT CRAFTSMAN

GIACOMO MALASPINA-RUBEN AMADORI

This project is based on the elements of lightness, functionality, attractive design and careful planning of the making phases. The technique mainly involves creating curved shapes through lamination. I began with a 1:1 scale drawing on an 8mm plywood sheet. This helped me to understand the lamp's mechanisms and functions, and also allowed me to put down ideas quickly.

PHOTOGRAPHS BY GIACOMO MALASPINA-RUBEN AMADORI





1 Cutting out the birch ply for the lamp base **2** Levelling the edge using a spokeshave **3** Gluing up the base sandwich construction
4 Bandsawing lamination strips with a fine skip tooth blade

THE LAMP

The support structure of the lamp is made up of a trellis consisting of three elements: two lateral fixed supports holding a central tilting arm. The first two are segments of a circumference while the third, which follows the shape of the first two, has a straight termination, a 'tail' that forms a sort of large J. These are all placed on a circular base featuring a slight indent that can be used for storing pens, etc. At the top, the lampshade, in turned maple, hangs on the central support by means of the power cable. The light source is a small LED ceiling light.

THE SUPPORTS

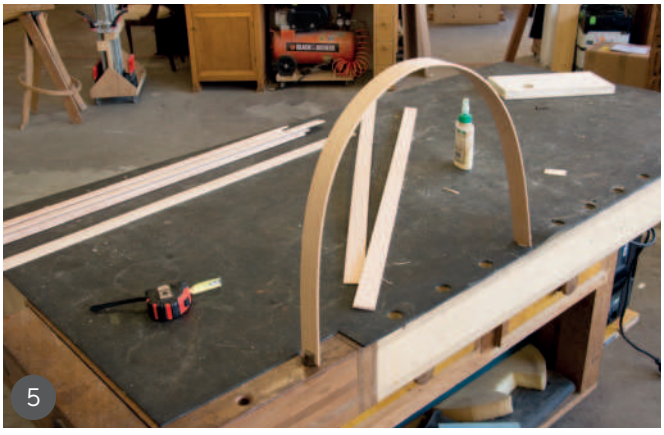
The three curved elements of the lamp are created with lamination. I used only one modular template, a semi-circle on which was added a straight extension to which it is possible to laminate the lateral circumference segments first and then the central one. The template was made of four layers of poplar plywood overlapped to a thickness of about 40mm, the final size of the arches is just under 30mm. This method allows you to make a perfect finish on only one layer, so after gluing the underlying ones, it would serve as a template for routing the profile with a copy bearing.

MATERIAL CHOICE

I chose to use beech for the lamp as it is reasonably flexible. During the bonding of the template, starting from a thick axis, I prepared the various laminate layers by cutting them with the bandsaw to gradually bring them to a thickness of about 3.5mm. From time to time the sheets were subjected to bending tests so that they could then be placed on the template without fear of breaking and without having to exert excessive pressure. They were chosen for their regular grain and because they were knot free. The thickness of the sheets had also been checked because when working on curved composite elements it is very difficult to vary the section thickness.

MACHINING TO SIZE

The lamination was carried out in two phases. First, using the basic template, I produced the two simple arches. Later, by adding the straight part, I was able to also prepare the third piece. The next stages were the planing of the sides of all three pieces. At first they were finished on the surface planer and then bandsawn on one face. Air pockets emerged between some layers that were promptly closed by inserting abundant glue and a new pressing on the template. Taking advantage of the planed edge,



5 Assessing the strips' ability to bend without breaking **6** Trimming the edges of the ply close to the already spokeshaved board
7 Using a straight profile cutter to trim the curve to shape **8** Using a jig to clamp the curved lamp arm

the laminations were brought to thickness on the bandsaw. The pieces were then cut to finished size and drilled: the two sides only required two pairs of holes. They are used to insert pins; one near the terminations fixed on the base of the lamp, as an alignment spacer, and the other placed on the opposite end to act as a support for the central tilting piece.

CABLE ALLOWANCE

The central arm is the one that required the most care. It houses the power cable that enters the lampshade through a hole passing through the end of the curve. The arm's seat was made at the cutter bench equipped with an adjustable groover. It was possible to get the width of the channel exact so the cable would keep it in place. The cable remains visible on the upper part of the lamp. The method I used to calibrate the depth of the slot is quite interesting: not being able to use the copying ring supplied with the router, I used an offset guide on the stop of the router table. By adjusting the protrusion of the cutter with respect to this guide, it was possible to cut with variable depth by following curved shapes. At the upper end of the machining there is a hole that allows the passage of the cable. It was made with the drill and adapted and flared on the part facing the lampshade with a mouse tail rasp.

ACCESS HOLE

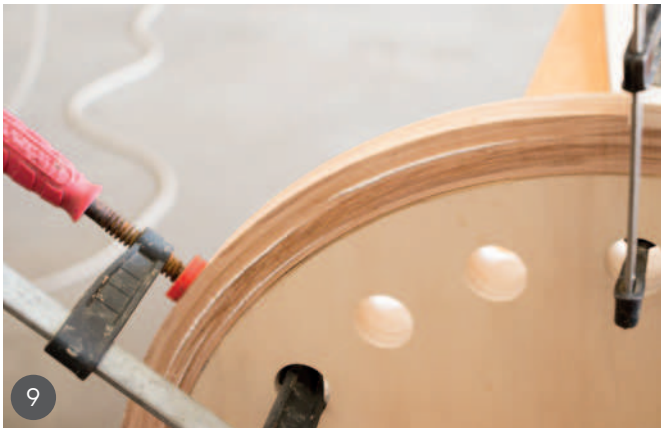
The last process consisted of machining a hole placed approximately at the join between the curved and the straight part. Its job is to give the lamp more reach so that it can project the light further away from the base, which, on a desk, could be an obstacle. The location of the hole was found experimentally, first by making a hole in a functional position and then lengthening as required. The work in this case was mainly done by hand, after a roughing out with a column drill and electric tunnel. All the pieces were finally smoothed and the edges rounded with a gentle curve from the inside to the outside of the arches.

THE BASE

Once the supports and the central arm were completed, it was time to prepare the base. I decided to use a circular shape to echo the general geometry of the project, which was already strongly marked by curved lines.

I prepared a beech disc about 35mm thick with the perimeter slightly flared outwards; this is the classic way to soften a squat shape without sacrificing volume or reducing the base size.

The assembly between the base and the pair of semi-circular supports required four screws, two for support. Placing them



9 Showing the glue squeeze-out when clamped **10** Trimming the arm curve to width **11** The end of the arm being sawn off before sanding **12** A rasp being used to finish the shaping

correctly required some care; in fact, given the small width of the two vertical pieces, the possibility of inserting them incorrectly was high. An error, even by a few millimetres, could have created damage that was difficult to repair, so I proceeded in several stages.

OFFSET SUPPORT

Compared to the base, the supports are placed in a rather decentralised position, a choice deliberately made to break the excessive symmetry that the project was acquiring up to this point. In this way, a large empty space was created which I decided to characterise with a shallow shell suitable for containing one or two pencils – drawing is another passion of mine! It is a rectangular shape with semi-circular ends and was entirely worked with a gouge before smoothing the inside very carefully. Leaving it blank does not break the linearity of the piece and it is useful to always keep the main tools of the designer at hand.

SUPER SMOOTH SURFACES

Because the wood does not change colour even in the presence of special processes, it must be perfectly smooth. There is an old trick of wetting the surface before the last passages with the abrasive. The water raises the fibres and highlights the defects, allowing the last corrections before finishing.

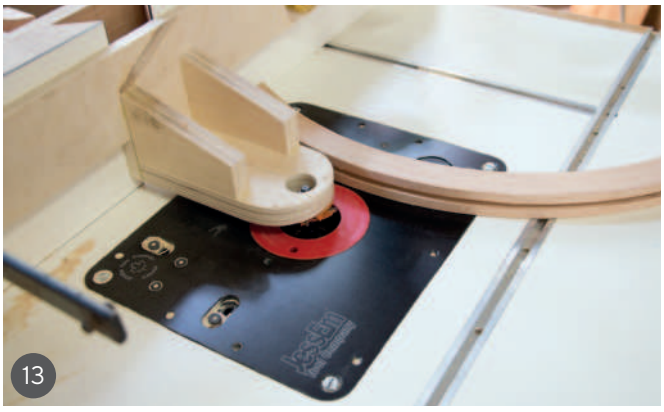
THE LAMPSHADE

With the lamp assembled I moved on to the processing of the lampshade. Again I opted for a simple form, which was created on the lathe. The scarcity of material available led me to use a piece made up of three overlapping maple layers. To be compatible with the size of the LED ceiling light used, I tried to limit the thickness to the maximum; both the overall one of the entire piece and that of the walls. The experiment was probably not 100% successful, but finding a less bulky light source would allow you to make the necessary changes.

For the light source, I used a 6,000K super-flat LED ceiling light with cold light. The machining of the lampshade was carried out on the lathe, leaving a relief in the centre of the piece, high enough and wide enough to contain the electronics part.

THE ACCESSORIES

The movements of the lamp work by interacting between the pin located at the top, between the lateral supports, and the slot on the central arm. This pin is not a simple circular strip but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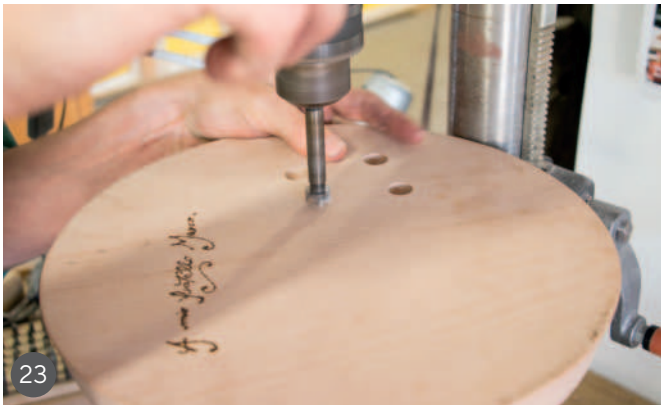
13 A shop-made guide mounted over the groover used for making the cable slot **14** Drilling one of the pivot holes **15** The swivel joint being test assembled **16** Shaping the twin arm supports **17** Using a gouge to shape the pen recess **18** A first application of finishing oil **19** Using a scrollsaw to cut out the pre-drilled slots **20** The curved slot smoothed evenly from end to end **21** A mouse tail rasp cleaning out the hole for the lighting flex **22** The components of the clamp including rubber washers **23** Drilling the recesses for the screw heads that hold the arm supports **24** Drilling the clearance holes from the other face **25** Pushing a screw plus washers into the hole ready for screwing in **26** The arm supports mounted on the base **27** A low-energy light ready for fitting into the wooden shade **28** Light neatly fitted in place ready for final assembly **29** The rubber sleeve that helps lock the lamp arm in position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incorporates a clamping mechanism. It became necessary to tie the position of the central support for the chosen excursion. I just loosened it a couple of turns, slid the support and tightened everything. To regulate the tilting movement, I decided to use gravity instead. This part of the lampshade was left slightly heavier than the 'tail', so I was ready to add hidden weights but it was not necessary, and to lock it at the desired height I just inserted a second pin, this time covered with rubber, at the crossing point between supports and arm. The friction generated by the rubber is sufficient to stop the descent of the lampshade. The visible parts of both pins are in American walnut, and the same material was used for the aligner-spacer pin located on the base of the fixed supports.

THE PINS

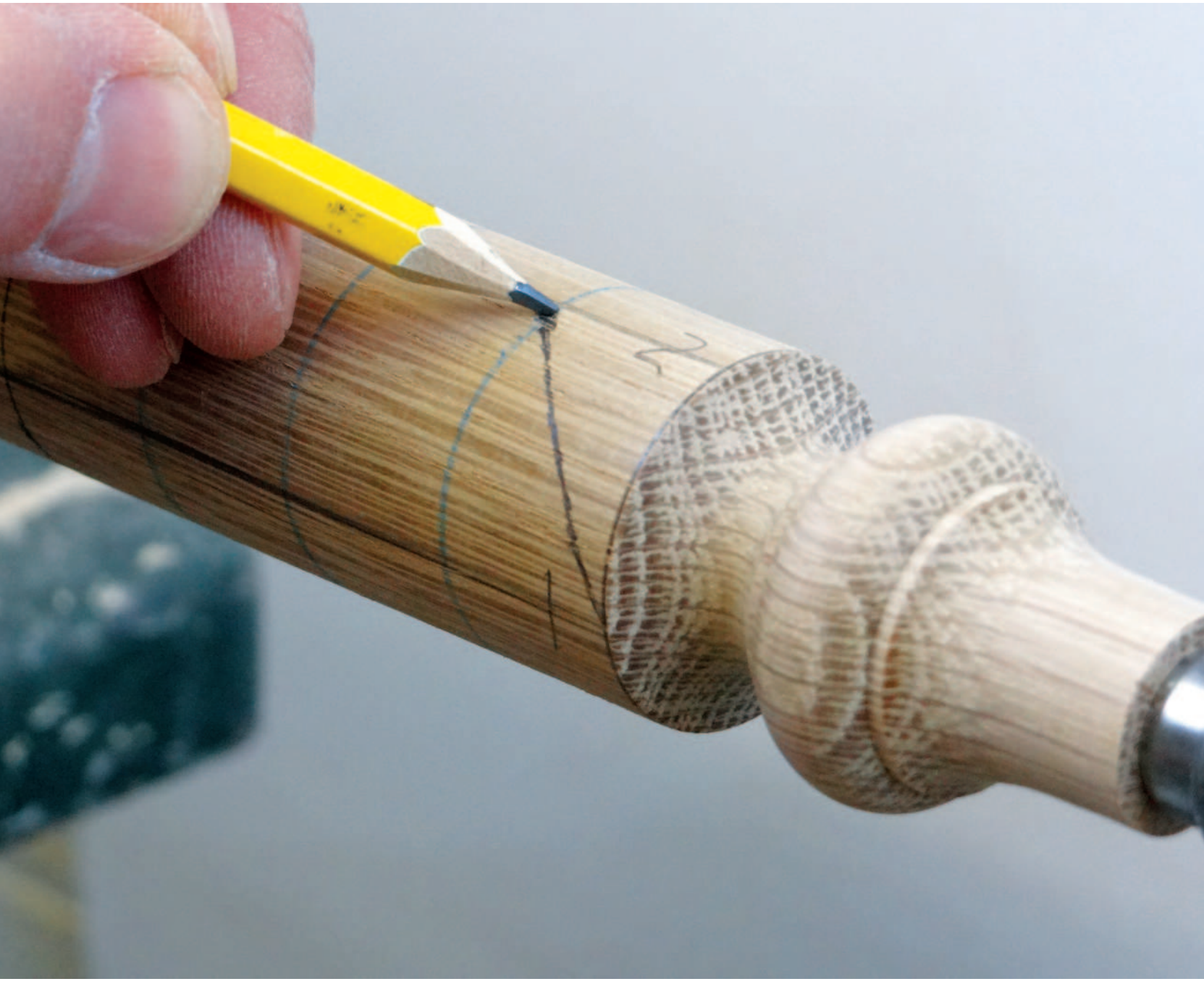
In the foreground, the aligning pin was placed between the vertical supports. It is a 12mm-diameter cylinder made from American walnut. The two upper knobs are connected by means of a threaded bar fixed by inserting two concrete anchors with epoxy glue. The rubber gaskets are placed between the swing arm and the fixed supports in order to increase friction and avoid scratches on the paintwork.

HOW DOES IT WORK?

The central arm can be stopped in a more or less advanced position by means of the buttonhole and the pin located above. The inclination is adjusted simply by varying the position of the rubber-coated pin. It remains trapped between the three curved elements preventing the lamp holder from going down.

THE FINISH

The lamp was carefully polished starting from a 220 to 320 grit, taking great care to smooth the edges but without rounding them excessively. The finish consisted of a coat of water-based sealer carefully sanded and followed by the application, with a soft-bristled brush, of water-based transparent varnish.



TURNING TWISTS

RICHARD FINDLEY DEMONSTRATES HOW TO REPRODUCE TWISTS ON SPINDLE WORK

In this article I'll take a detailed look at reproducing a twist on spindle work. Although industrial copy lathes can produce a range of twists very quickly, accurately and relatively cheaply, hand turning and cutting twists means you can reproduce any type of twist in any type of timber. Handmade twists also have the advantage of natural flaws. A machine-cut twist will be perfect, every time. Even the most perfect hand-cut twist will have a certain number of flaws, but these flaws give character and life to the item and tell a story that only a hand-crafted item can. This is a particular advantage when furniture is needed in old buildings and has to fit in with other hand-crafted detailing.

PHOTOGRAPHS BY RICHARD FINDLEY

1 The original leg, with the turned leg, ready to twist
2 Drawing the start lines along the spindle, level with the corners of the pommel
3 The dividers are positioned to show the length of the pitch, between the crests of one full twist

TURN OR TWIST FIRST?

I am often asked which to do first, the twisting or the turning. It doesn't really matter, but I normally recommend doing the thing you are best at last. It would be a shame to spend all that time and effort cutting the twist, only to ruin it with a heavy catch. Likewise it would be a shame to have spent time doing the turning only to mess up the twist. The other thing to keep in mind is that sometimes, when working the twist, you can catch details such as beads with the tools, which means they will need reshaping anyway. The best thing is to look at the design of the job in hand, and make a judgement call, knowing your own skill level, to help you decide which part you will do first.

WHERE TO START

When I am commissioned to make a twist, there are usually two ways it happens. The first is when the client has an original and needs a certain number of reproductions. The other is when I am asked to cut a twist on a spindle, they don't mind what, in which case I make a double twist, which is my personal preference. For this article, I will show how to reproduce a double twist from an original sample – discussing the other styles along the way.

In my opinion, the key to producing a successful twist – especially if more than one is required – is the setting out. I've been told by a few people that they 'don't bother with all that setting out nonsense', preferring instead to simply wrap a piece of masking tape around the spindle. This is fine if you only want to make one twist, and are not trying to copy an original, but in my experience, you rarely make one twist. Candlesticks and lamps come in pairs, as do pilasters, and stair spindles can require large numbers of duplicates. This means that good setting out is vital, because once you have the setting out sorted, you have control of the twist, you can easily make identical multiples and you can also start making left- or right-handed twists – as a matching pair has one of each.

START LINES

With the area for twisting turned and smoothed, the first part of the setting out is to draw the start lines. These give a fixed point for the twist to start and finish. For this double twist you need four start lines, running the length of the spindle and equally spaced around it. If you have indexing then you can use that, but there are a number of easier and quicker ways of equally spacing the four start lines:

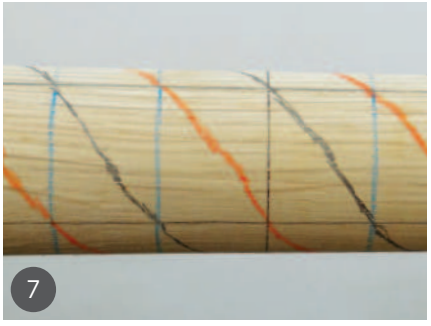
- A spindle with a square pommel like the one in the photo has four corners.
- If you are using a chuck, they have four jaws.
- If you use a four-prong centre, they have four prongs.

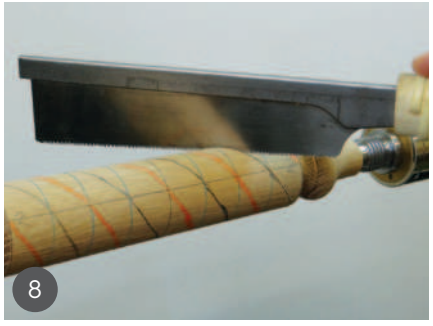
Simply set your toolrest at centre height, position the corner of the pommel or gap between the chuck jaws – or whatever method you choose – level with the toolrest, and draw a pencil line along the area of the twist. Number these lines 1-4.

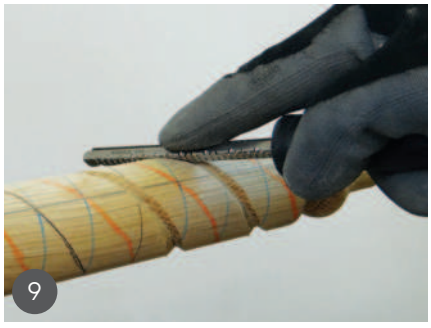
The only thing to be aware of, if you are copying a master part, is that the start point may not be at the corner, the original maker may have used the centre of the face on the pommel, or even some random point, so study the sample closely.

PITCH LINES

The pitch is the key element in twisting, so you need to take note of the pitch of the twist. So what is the pitch? Basically, the pitch is the length of one full twist, the distance between the high point and the next high point on the same twist. Usually the twist is positioned evenly along the spindle, so try to identify where the high points are on the spindle, and mark the positions of the pitch lines from there. If you are setting out your own twist from scratch, simply space them evenly along the spindle, starting and finishing on the same start line.







4 The pitch lines drawn on the spindle **5** The spindle showing the pitch lines in pencil and pitch dividing lines in blue **6** Drawing the lines across the grid **7** The setting out is complete with the valleys drawn in pencil and the bines marked in orange **8** First cuts with the saw **9** Making a groove with the small Microplane rasp, following the saw cut

PITCH GUIDELINES FOR SETTING A TWIST FROM SCRATCH

If you are setting out a twist from scratch, it helps to have some sort of guidance as to how far apart your pitch lines need to be, to look their best. This is a combination of the overall length of the twist and the thickness of the material.

A properly formed twist should start and finish on the same start line, so you need to divide the length of your twist into equal pitch sections. How many pitches you fit into that space can be guided by the thickness of the material, ensuring the twist looks balanced and complete, rather than being cut randomly on the spindle.

Keeping this in mind, the pitch lengths will look best using the following guidelines:

- Single twist – pitch is roughly the same as the thickness of the material.
- Double twist – pitch is two times the thickness of the material.
- Triple twist – pitch is two-and-a-half to three times the thickness of the material.
- Multi-start twist – which have four or more twists. Pitch is four times the thickness of the material.

DRAWING OUT THE TWIST

So far, we have the area turned and ready for twisting. There are four start lines, running the length of the spindle, and pitch lines running around the spindle. In the case of the example in photos 5–7, there are two full twists or pitches, running the length of the spindle. The next stage is to draw out the lines of the twist, but we need more guidance first. There are four start lines running the length of the spindle, so if I divide the pitch into four with pitch dividing lines, this will give a grid, allowing the twist to be drawn with ease. A left-hand twist runs from left to right, a right-hand twist runs right to left. The example I'm making is a right-hand twist, but having the grid drawn out gives full control of the twist. Simply by joining the corners of the grid in one direction or the other, you can form either twist, and remember a matching pair of twists has one of each. Using this setting-out grid removes any guesswork from making the twist.

Here I use a pencil line for the valley, and a coloured pencil line for the twist – or bine as it's known. Starting on start line 1, at the right-hand end (for a right-hand twist) draw a line diagonally across the first grid, joining the corners, then the next, and the next. Keep going until you get to the other end, finishing on start line 1. You should have crossed the pitch line on start line 1 as well.

Go to start line 3 and repeat. Then, on start lines 2 and 4, using a coloured pencil, repeat the process. You should now have the twist drawn on the spindle, the high points marked out in coloured pencil and the low points – or valleys – marked in pencil. Lay the original spindle next to your spindle to check it looks right.

FIRST CUTS

With the twist marked out, the next step is to make a cut. I use a small Japanese saw here, but any sharp small saw works just fine. Follow the pencil line that marks the valley with the saw. People often think that the saw cut marks the depth of the valley, and I have seen examples where blocks of wood have been clamped to the saw blade as a depth

10 The initial grooves complete, and comparing it to the original **11** Working with the larger Microplane **12** Comparing with the original again after the groove is cut **13** Microplane rasps **14** The rigid Microplane blade in use **15** Comparing with the original once again

stop. The saw cut is not a depth marker, it merely guides the next tool along the cut line. It is possible to work without the saw cut, but I find it does make it easier.

With the saw cut made along both valley lines – it's a double twist remember, so everything has to be done twice – I next use a small square Microplane rasp to enlarge the saw cut and form the beginnings of the valley. Because the small Microplane follows the saw cut, it is easy to cut it in the right place. The valley groove now just needs enlarging by swapping to the larger square Microplane. Once again, this simply follows the groove already cut.

You can miss out the first two steps and go straight for the large Microplane, but great care needs to be taken to ensure you follow the lines and don't wander off and potentially compromise the design. Because the twist on my original sample is quite a tight twist, the valleys are more V-shaped, so the square Microplane is the best tool to use. If the valleys are more U-shaped, then the round Microplane will suit the job better.

MICROPLANE RASPS

Microplane rasps are a revolution in cutting twists by hand. Their laser-cut teeth remove the timber at a very fast rate, while still giving the control of a hand tool. Before Microplanes came along, there was only the Stanley Surform. When choosing tools for twisting you will often find a Surform on the same page in your tool catalogue as the Microplanes, and usually considerably cheaper. Feel free to try it, but I can assure you that it cuts at roughly half the speed of the modern tool. There are times when copying an old twist that a Surform is the best tool to use, because the twist was originally cut with it and so the shape matches perfectly, in which case I will do the roughing work with the Microplane before switching to the Surform to finish off the twist. I also have a collection of other tools that come in handy from time to time for various other types of twisting and detailing work. The only down sides to the Microplanes are the handles, which are plastic and made in a shape that isn't conducive to working for long periods with the tool. The spine of the blade can also be very sharp, so a plaster worn on your forefinger, or even a glove, is a good idea to prevent cuts.

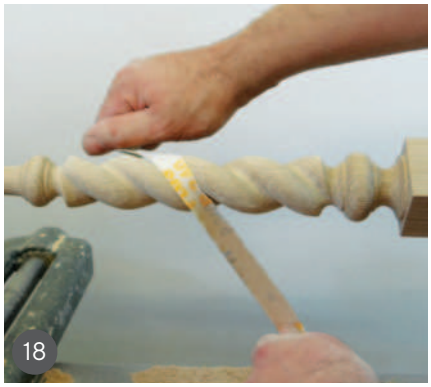
HOW DEEP TO CUT?

With the valleys forming, the next question is how deep do you cut? When copying a twist, you will have that information in front of you with the original sample. If you are making your own twist then the guidance is linked, once again, to the thickness of the material:

- Single twist – one third to one half the thickness of the material.
- Double twist – one quarter the thickness of the material.
- Triple twist – one sixth the thickness of the material.

ROUNDING THE TOPS OF THE BINES

There are a number of ways of rounding the bines over, and over the years I have tried many options. The best I have



16 The sanding stick in action **17** The twist is looking much improved in this comparison **18** Working with the strip of abrasive **19** Wetting the twist **20** Final sanding with the lathe running at 200rpm **21** The final tidying cut in the cove, to crisp the end of the twist

found is the Microplane rigid rasp for hacksaws. Designed for use in a hacksaw frame, I found this to be uncomfortable and cumbersome, so I made a handle for it. This was easily made from a piece of scrap timber, with a comfortable turned handle and a gap to allow the shavings to escape. The rigid blade has rounded edges without teeth, which allows me to work around the bine without damaging or cutting further into the valley. Because it cuts, it leaves a smooth – if faceted – surface, ready for sanding. As with all the cutting using the Microplanes, I find getting into a rhythm is very important as this enables even amounts of timber to be removed, keeping the shape of the twist balanced all the way along its length.

You should now see the twist emerging from the timber. Throughout the cutting process, compare the twist to the original and make changes where they seem necessary, whether it be to open out the width of the valley more, or deepen it slightly, or whatever, until the twist looks as close to the original as possible.

SANDING

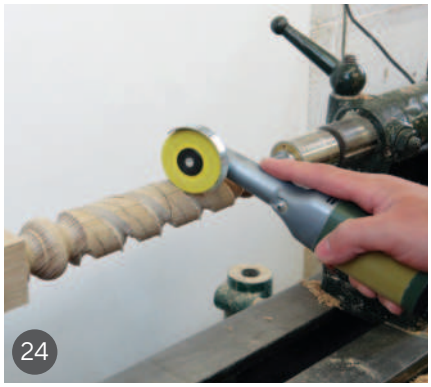
The twist should now look pretty much the same as the sample, only rougher and more faceted. The smoothing process can now start. I begin by using a sanding stick: a piece of timber, around 10mm thick, with the bottom edge rounded over. Because the abrasive I use is hook-and-loop backed, I fix this on the sides of the stick to hold it in place. I can then work along the twist, cleaning the bottom of the valleys and around the sides of the bines. Generally I start with 120-grit abrasive, but don't be afraid to use 80 grit if you need to.

As with all sanding processes, the aim is to remove all scratch marks from the previous tools, and all facets, leaving a smooth surface, ready to sand through progressively finer grits. I use 120 and 180 grits with my sanding stick, before moving to the next stage of sanding.

I cut or tear a strip of 180-grit abrasive, around 12mm wide and 300–400mm long, and work it around the twist. A good flexible abrasive will flex around the shape of the twist and into the valleys. This process helps to further blend the bines and valleys, smoothing any facets and removing the previous sanding marks. This is repeated with 240 grit as well.

Study the twist now critically. Check for any tool marks or heavy sanding scratches you may have missed and spot-sand with 240 grit until smooth. I find it can help to reverse the timber in the lathe and repeat,as the altered angle gives a new perspective. If you are copying a twist, check your twist against the original to make sure it still looks right. I then wet the twist, which raises the grain and will often reveal more spots that need further improvement before moving on.

The final sanding stage can be done with the lathe running, and is the only stage where this is appropriate. As long as your lathe goes below about 350rpm, then this will be possible. I find around 200rpm to be ideal, any faster and you have no chance of sanding it properly,



22 Final comparison on the lathe **23** The completed leg, ready for staining and finishing **24** The Proxxon grinder in action **25** The tools used to make the twist on this leg **26** Assorted tools that can be useful for working twists

so don't bother – simply hand sand the twist instead. I use a piece of 320-grit abrasive and work along the rotating twist, working around the bines and into the valleys with my fingers. Once again, reverse the spindle in the lathe and repeat. I finish off by repeating this process with a red Nyweb pad.

FINISHING TOUCHES

Most twists finish in some sort of hollow detail, such as a cove. This can be cut before the twist is started, but I find that by recutting it right at the end of the job, it tidies up the ends of the twist, leaving it crisp and sharp. The whole of the rest of the spindle will need sanding now, or resanding, as during the twisting process the work normally picks up mucky fingerprints, which need removing.

TOOLS FOR TWISTS

Today there are a number of power tools that can help to speed up and reduce the physical exertion of cutting twists. The question is, should you?

In my training as a joiner, I was taught to cut joints first by hand, before moving to machines to cut them – this gives the necessary skills without a reliance on machinery. That's why I always demonstrate and write about cutting twists by hand, to pass the skills needed to build a base knowledge. The concern is that the use of power tools has a de-skilling effect. This may be the case for cutting twists on a copy lathe, where the skill is in the machine setting rather than the actual cutting, but in my experience using a power tool to cut a twist, such as an angle grinder fitted with a wood-cutting wheel, requires just as much skill to form the correct shapes as doing it by hand does. So in my opinion, there is no problem with using a power tool to cut a twist, as long as you can do it safely.

I have tried several different power tools and my preference is for the Proxxon long neck angle grinder, fitted with a Saburr Tooth slitting wheel. This is lightweight and smaller than a standard angle grinder, designed for use single- or double-handed, as necessary. It's comfortable to use for longer periods, and speeds up the process considerably. It is also incredibly safe, being easily controllable. Using power tools requires the use of the correct PPE, as they quickly – and noisily – make a lot of dust!

NICK JAMES

COMBINING TRADITIONAL HAND SKILLS WITH MODERN MACHINERY, **NICK JAMES** HAS DEVELOPED A STUNNING RANGE OF MID-CENTURY INSPIRED FURNITURE. HE CHATS TO *F&C* ABOUT IT

Every piece tells a story. Nick James is an advocate of traditional woodworking techniques that aren't commonly seen in modern furniture production, and uses highest quality sustainable materials to create pieces designed to last forever in his Newcastle workshop.

Nick started out studying Applied Arts at Derby University, where he learned to develop the concepts, reasoning and narrative behind his work – all key components. But when he left he felt frustrated at the lack of making skills he had learned.

'I wanted to make things well that would stand the test of time, so I went back to college – Rycotewood Furniture Centre in Oxford – where I learned the vocational side of things: things like how to sharpen a chisel properly, how to change a saw blade, how a tree grows and how to cut a dovetail joint.

'My time at Rycotewood taught me the nuts and bolts of how to make my work. It's important to me that my work has a story and reason for being – but it must be well made so it can stand the test of time.'

Nick returned to the north east fresh out of college in 2003 to start his own business designing and making furniture.

'Initially it was just me, working mostly to commission – everything was made to order. I was quite clear that I wanted to make freestanding pieces from the outset and managed to avoid the temptations of doing too much fitted work or kitchens.'

A HOME FOR MAKERS

An early challenge was finding the right place to base his workshop. 'I knew I needed things like three-phase electricity, wide doors for getting furniture and machines in and out and a ground floor location, somewhere I could make a lot of noise and dust, but I couldn't find anywhere I could afford. In my search for the perfect workshop I came across some huge old warehouses in Newcastle that were almost derelict. I thought these would be ideal, but they were out of my price range.

'I also knew I wanted to be surrounded by other daft creative types, so I came up with the idea of merging these two ideas together. I somehow managed to convince a bank to lend me some money to buy an old warehouse and won some grant funding from the Arts Council England and Newcastle City Council to refurbish the building. The Mushroom Works was born.

'We now have a small gallery, my workshop and 10 other studios and workshops housing jewellers, painters, illustrators, textile artists, photographers and designers. It's a great place to be and work, and there is always someone looking to put a kettle on. The support that happens in a creative community like this is invaluable, whether it's someone to collaborate with, someone to help resolve a creative problem – or just another opinion.'

BUILDING A BUSINESS

Nick worked on his own for the first five years, taking on his first staff member in 2008 – 'a big step at the time' – and the team has now grown to four. At the same time his work has evolved, in part thanks to growing online availability and consumers' confidence in online shopping.

Nick explains: 'Sixty per cent of my work is commissioned: I make pieces of furniture to order for individual private clients and commercial contracts, which can be anything from a coffee table to a boardroom table and everything in between. Thirty-five per cent of my work is batch-produced small products, such as lighting, clocks and kitchenware, which I mostly sell online on my own website and others such as Not on The High Street and Etsy. I also wholesale some of these products to independent shops and galleries.

'Five per cent of my work is speculative: work I make for exhibition in shows such as the Celebration of Craftsmanship & Design (CCD) in Cheltenham, the Great Northern Contemporary Craft Fair in Manchester and the London Design Festival. This is my favourite part of my job! This is work which is not necessarily for anyone – but work I make to satisfy my creative enquiries, often trying out a new idea or technique, challenging myself to do something I have not done before or a little outside my comfort zone.'

Nick says: 'These speculative works usually start with a challenge I set myself, such as how to use a particular machine in a new way, work with a new material, develop a new style or respond to an exhibition brief.'

Examples include the scalloped drinks cabinet and sideboard he made for CCD, using CNC technology to achieve textured panels for the doors, and the Formica marquetry cabinet with geometric-patterned drawers he made in response to a brief from northern art gallery the Bowes Museum, to create a piece that responded to their collection in some way. Nick says: 'They have an incredible collection of classic French furniture and some exquisite marquetry, so I chose to create a contemporary response in which I used a laser cutter to cut Formica, a contemporary material, and used marquetry techniques to swap and inlay different materials into the same pattern, to create a piece with decorative panelling but that was much more contemporary in style.'

He adds: 'These pieces often then lead to new commissions. Clients can see these new techniques and styles and get something made to suit their needs. Often it is hard to communicate new ideas to new clients, and this is the best way I can share with others what I have in my head.'

'You have to break a few eggs when making an omelette and we can put these mistakes down to experience. Learning what not to do is as important and what to do.'

MAN VERSUS MACHINE?

Nick uses CNC to speed up his processes, using Vcarve from Vectric to do most of his CNC programming and linking it up to SketchUp, when needed, to model pieces before they are made. He says: 'Using CNC to make furniture is a current trend, and I expect some think this is the answer to all of our needs. CNC deals well with repetition and accuracy – but man alone can achieve this too, given a little patience and a good ruler! The increasing pace of our lives and need for the immediate – and the greatly reduced costs of some modern CNC kit – have made CNC more attractive.

'Using CNC means the work I produce can be more attractively priced because running a machine to do something that I would have done by hand essentially means I can do two things at once. Once the CNC machine is programmed and running I can get on with another part of the job, or another job altogether. That makes me twice as productive – it is like having another pair of hands.'

Learning to use the CNC machine was a steep learning curve – much like learning the piano, according to Nick: 'You can start out with a few notes to achieve simple results, but the more complex the design the more notes you use, and there are so many variables to consider. The results can be very impressive when played right, but one wrong note and the whole piece can be ruined.

LEARNING FROM EXPERIENCE

'You have to break a few eggs when making an omelette and we can put these mistakes down to experience. Learning what not to do is as important as what to do.'

He adds: 'It does take time to learn a new skill, whether that is how to cut a straight line with a dovetail saw or how to programme a surface pattern in three dimensions. The skill of the designer comes in making something that is attractive and that people will want to buy, whether that is with CNC or not. At the end of the day it is just a tool in our tool box.

'When working with any machinery and material, experience is invaluable – and often the difference between success and failure. Thankfully we have not reached the point where artificial intelligence has taken over, and we still need to command the equipment we use to achieve the desired results, whether this is a hand plane or a CNC router: the maker is in control and is responsible for the outcome.

'In furniture making there is always more than one way to achieve the same result – some easier than others. In a good piece of design or furniture, it should not be obviously CNC made or not. CNC does make our lives easier, but is not an answer to all making problems and challenges.'

And for some things, traditional methods are simply the best. Nick says: 'I do believe there are things the machines cannot do, like hand-cut dovetails. It would be hard to achieve such fine pins as only a hand-cut dovetail can achieve. That being said, given enough time I'm sure there would be a way to emulate this, but I would question why.'

EXPLORATIONS

CNC has opened up some new paths for Nick's designs: 'I am currently looking into developing patterns and textures in wood, something that CNC deals with very well, because it involves repetition and accuracy. This can be seen in my oak drinks cabinet – the scalloped texture was made with a CNC router, as it is important to me that it is geometrically perfect and accurate. I could have made the doors with a hand router and jig, but it would have taken a lot longer than the four hours it took to machine them, meaning it would have to be even more expensive.'

He has also been looking into working with other materials using his CNC machine. 'The results I have achieved in solid surface and brass are particularly exciting,' he says.

Nick's furniture-making style is influenced by mid-century design, where softened edges and rounded forms can expose the grain and texture of solid wood, and he takes a great deal of inspiration from mathematics, geometry and patterns that can be found in nature. 'I have an obsession with the Gold Section and use it a lot when I am designing my work,' he says.

One of Nick's favourite recent projects has been making a range of bar stools for a client in London – something that used to be done exclusively by hand, but has now been streamlined with part of the process taken over by CNC. 'You can't tell the difference,' he says. 'I quite enjoy refining the process of making a product to make it better, easier and quicker to make.' He is also working on a range of kitchenware using his offcuts – including using his CNC router to make trays, plates and spoons from offcuts from his sideboards and spoons and spatulas from offcuts of his standard lamps. 'I'm continually amazed about the size and quality of the wood I put in the workshop stove,' he says. 'I have been matching this with the CNC process to create products which can be continually made with the waste materials from my projects. I have an ever growing rack of offcuts that are too good to burn, and now I have a robot to put to work to convert them into beautiful products while I am making furniture!'

CARVING THROUGH TOUGH TIMES

Social distancing measures in the Coronavirus pandemic have meant big changes for Nick. He says: 'This has been an unprecedented event that has completely changed the way we work and will have huge ramifications worldwide for all. That being said, the world does keep turning and it is important to try and keep on working where possible. It is difficult to work at distance in my relatively small workshop, so I have had to make the hard decision to furlough my staff and send them home. The support from central government has been a real help to keep them on the books, and means I don't have to make them redundant at this time. It means they can come back to work when the threat of the virus has abated.

'Meanwhile I am working alone in the workshop to keep my business going, as this cannot be done from home. I have quite a few orders to keep working on for now, and online sales are still coming in, as are a few commissions.' He is also batch-producing small products and preparing new stock for Christmas.

Nick adds: 'It's taking a lot longer to make things as I am running my business on 25% capacity – but it does bring me back to the old days of when I first started when it was just me. It is getting a bit lonely in the workshop though…'

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Hello


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CONTRA BOX

THOMAS EDDOLLS MAKES A GALLERY-WORTHY JEWELLERY BOX

After making pieces of furniture for the Celebration of Craftsmanship and Design (CCD) exhibition, I wanted to put some new work into The Gallery at the Guild in Chipping Campden, Gloucestershire, of which I am very fortunate to be a member. Housed in Sheep Street's historic old silk mill, it is a co-operative of talented artists and craftspeople who exhibit and help run the gallery, which is on the site of CR Ashbee's relocated Guild of Handicraft.

So, a jewellery box, I thought to myself. I have always found the stark contrast of light and dark appealing and so after considering material options I went for a particular favourite rippled sycamore for the box carcass and, having a small quantity of pressure-fumed quartersawn oak left over from another job, I decided to use this as a contrasting material for the lid and internal trays.

THROUGH DOVETAILS

After making a few preliminary sketches to decide on the box's size and proportions, I converted the sycamore and dimensioned the components on the panel saw.

The next step was to set out the tail boards. I was aiming at a clean-lined, finely crafted piece on this occasion, and so after trying out a few different variations I finally settled for a composition that I found attractive and suitable, allowing for the thickness of the lid to be incorporated.

I then cut the tails on the bandsaw guided off the rip fence with a 1-in-8 angled sled jig, simply constructed out of MDF. A nice, sharp fine blade and a considered feed speed yielded good results.

This might seem a bit of a cheat to purists, but after laboriously hand-cutting many dovetails, it's become apparent

PHOTOGRAPHS BY THOMAS EDDOLLS

1 Paring down the pins **2** & **3** Checking for fit **4** The dry assembly

that sometimes you can make a rod for your own back with regard to the application of hand work. Conversely, the same applies to being a slave to machine procedures, in my opinion, when a hand tool can be skilfully used to achieve the desired outcome quicker than it can take to make up jigs.

The tails were rip cut on the bandsaw and the pin waste was sawn out with a coping saw. Then the end grain of the pin sockets was carefully pared down by hand with chisels.

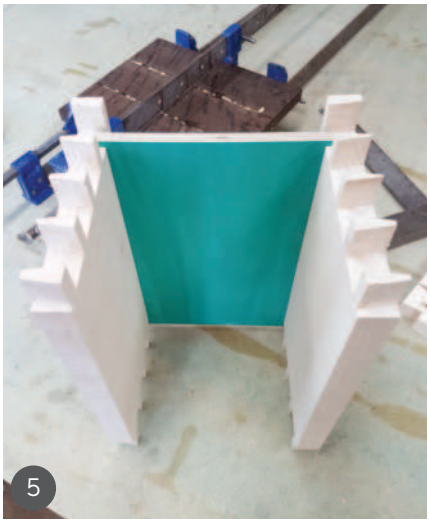
Now the tails could be transcribed on to the pin boards, first locating them accurately to the marking gauge line and registering the components from the bottom of the components with an engineer's square.

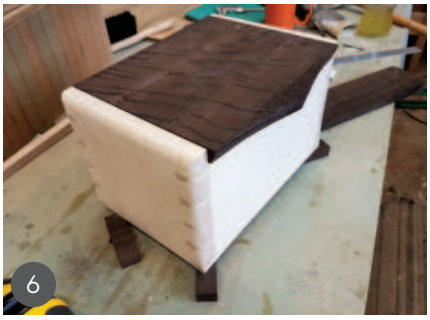
First I lightly scored the position on to the pins with a scalpel – a Swann Moreton No 10 – before removing the tailboard and firming up the marks with a Japanese V-point marking knife, carefully making sure the bevelled edge was scored into the waste section.

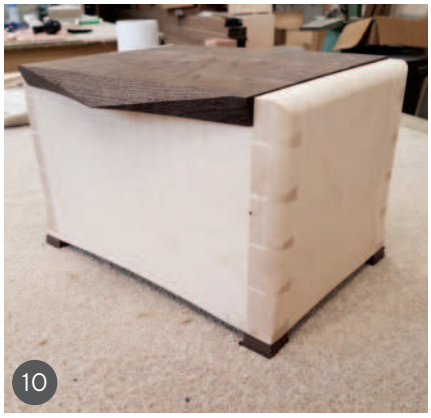
Once this was achieved, I could begin to cut the pins. Lighter timbers like maple and sycamore will show up any discrepancies in the joint lines and, being a small hand-held piece that will be under close observational scrutiny, this box's craftsmanship would have to be executed to unerring standards.

I then had to saw down the pins. I normally mark the knife-scribed indentations down the pin boards to the cutting gauge mark with a 0.3 mechanical pencil with a trusty light duty engineer's square as a guide.

On thin stock, such as for drawer work, sometimes I will hit joints straight off the saw, but for this piece I decided to cut







5 Fitting the veneered base **6** Looking at the details **7** Observing things from different angles
8 Hand working the lid **9** Checking the overall proportion **10** The box in the raw

just shy of my marks with a view to carefully paring back to the scribe lines with chisels.

After all the pins were cut, the tail waste needed to be removed. In cases like this I often rough saw out the waste on the bandsaw, or sometimes a jigsaw for larger components, using machinery to take on the donkey work.

Finishing things off by hand with a coping saw, I then carefully pared across the grain gently and delicately down to my knife lines. Once this stage was achieved I could, using a sharp top-bearing hinge recessing router cutter, rout out the rest of the waste down to my cutting gauge scribe lines, following the pins with the bearing and holding the router square to the workpiece with a batten cramped on to the workpiece flush with the pin tops on which the router base can rest and register, giving me a stable platform to work from.

It's worth mentioning here that it is very important to take care not to tear out the end grain of the tail sockets. To achieve this I work with the pin boards face out and gently back cut a proportion of the waste before routing the rest out in a more conventional manner.

Once this stage was accomplished, a tidy-up was needed by hand and after a careful inspection the joints were knocked partway home to check the fit.

All of my careful work had been worth it and things were looking good.

BOX LID AND TRAYS

It was now time to think about the lid and internals. After carefully jointing up some quartersawn sections of fumed oak for the lid, I veneered a section of ply for the base using a dyed green veneer obtainable from the Wood Veneer Hub. I would be reusing this element later on in the project.

With these elements completed it was time to glue the box together using a personal favourite of mine, Titebond 2. I had to work fast with the glue application and cramps in the summer heat. It can be easy to split the components when bringing home tightly jointed dovetails, so I often use a thick wooden caul to strike my mallet on to, dispersing the blow, working around each joint to bring everything home together before cramping everything tightly up with sash cramps.

The box carcass readied, it was now time to start thinking about the visual design elements. At this stage I had left quite a bit of scope for different ideas to be incorporated so I could now start experimenting with the spokeshave and getting a feel for how the piece would evolve, working shapes and details into each other, watching how they interacted and refining things as

11 Gluing up the tray work **12** The sycamore dowel pins **13** The veneer key and reinforcment pin work
14 Ready for the clean down **15** Fitting the trays **16** Veneer key reinforcements

I went along. Simple curves and chamfers combined to create a stylish and subtle effect and, after progressing through this enjoyable creative journey, I found I had arrived at a place where I was happy to move on to the next stage, tray making.

After the laborious and painstaking work of through dovetailing the box carcass, I wanted to achieve a balance of craft, function and economy with the tray making and so, after some consideration, I milled out the tray components with rebated ends and sides to accept a veneered base.

After a careful measure up of the box internals, these were mitred together on the panel saw. Divisions were set out in two different arrangements for individuality and diversity and dimensioned to exact size for a direct butt joint fit.

I then glued the internal divisions together where necessary in order to make the pinned reinforcement process as easy and stress free as possible. The pins were made out of contrasting sycamore dowels.

The process was to drill through the joint in my preconfigured arrangement with a 3mm lip and spur and then bolster up the joint by gluing in shop-made dowel pins.

The pins were made by carefully bandsawing 3.2mm sections of sycamore which were then held in a hand drill with which I could 'turn' the sections down to round section dimensions by running them through two hard-backed sanding blocks of 120 grit. I cut them to length, added a dab of glue and there was the finished joint.

Once the internals were complete, I could glue the outer ends and sides together to complete the tray. The mitres were butt-jointed again, awaiting reinforcement once the glue had cured. These would have a row of decorative veneer key works to strengthen the mitres cut on tangential angles to emulate a dovetailed shape, incorporating dyed veneers as used for the bases.

It's worth mentioning how important the veneer grain direction is here, long grain through the mitre is best for strength.

FINISHING TOUCHES

I hinged the lid on with American precision-made Brusso stop hinges and glued the tray bases in and fitted the trays by hand to a soft close piston fit. Looking at the piece overall, I decided that chamfered oak feet would set the whole thing off nicely. Then all that was left was the clean-up, sanding by hand to 240 grit in preparation for oil. I opted for an established favourite of mine, Osmo Satin Polyx oil.

PHOTOGRAPH: SHUTTERSTOCK.COM

WORKSHOP SAFETY – WOOD DUST

GEOFFREY LAYCOCK GIVES ADVICE ON ONE OF THE MOST COMMON WORKSHOP HAZARDS

We all know that wood dust is hazardous – but when it comes to discussing it, size matters. Dust is an aerosol of solid particles, mechanically produced, with individual particle diameters measurable from 0.1µm upwards. An aerosol is a suspension of fine solid particles in a gas, in this case wood dust in air. For exposure assessment purposes, two size classifications – inhalable and respirable – are defined.

Inhalable dust is small enough to enter the nose and mouth during breathing and respirable dust is that part of the inhalable dust that will penetrate down into the lungs, usually less than 10µm in size.

PHOTOGRAPHS BY GEOFFREY LAYCOCK, UNLESS OTHERWISE STATED

This photo shows 5mg of dust from beech veneer. For comparison, on the left is a standard LR44 cell; the dust is about one-fifth or less its volume. On the right is a piece that represents 5mg of solid beech. The pile of dust is bigger as it contains air. Now imagine that pile of dust equally distributed in a metre cube of air – not much, is it?

LIMITS ON WOOD DUST

How we consider dust hazards depends on whether we are in a work situation or a hobby one. In the UK, Workplace Exposure Limits (WELs) are legally enforceable. In the US, standards and regulations are set by the Occupational Safety and Health Administration (OSHA). Wood dust has assigned limits for both hardwood and softwood, at 5mg per cubic metre, meaning exposure in the workshop should not be more than this level and as close to zero as possible. Softwood dust is also noted as a 'sensitiser', meaning it can cause occupational asthma, while hardwood dust is noted as both 'sensitiser' and 'carcinogenic'. For the hobby woodworker, it is strongly advised this maximum level of exposure is adopted and worked down to as close as possible to zero. If you're wondering what 5mg of wood dust looks like, see above.

CHECKING FOR 'INVISIBLE' DUST

It is the smaller wood dust particles, often invisible to the eye, which cause the most health hazards. However, having said that it is invisible, this is the stuff you see floating around in that glorious sunlight streaming through the window. Using a powerful parallel light beam is a common method of investigating airborne dust sources and control – it's called the Tyndall effect. Try it yourself.

HEALTH HAZARDS

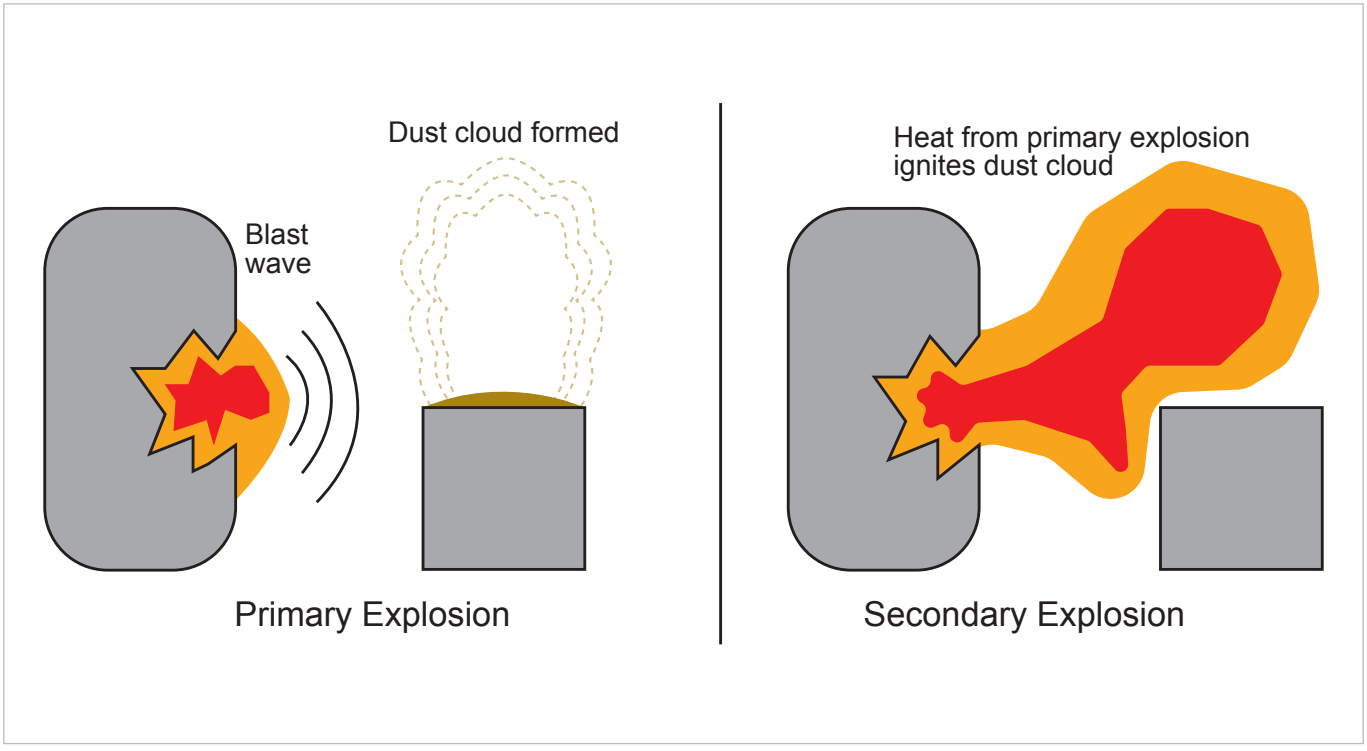
Inhaling dust initially causes a problem in the nose, where some particles are trapped by the wet surfaces – exactly what they are designed to do. Unfortunately, dust particles that have been stopped from moving further into the lungs can cause irritation to those wet surfaces. One result can be rhinitis and some woods are specifically known for this problem – African mahogany, obeche and European walnut are examples.

Dust, particularly from hardwood, trapped in the nasal passages, can result in cancer. Penetrating the respiratory system further, we can have adverse effects such as bronchial disorders, decrease in lung function and development of asthma. Some examples include cedar (Central and South American and western red), iroko, maple and most species of pine.

As well as health problems caused by inhaling dust, wood dust can contaminate the skin and cause dermatitis, and particles getting inside the eyelids and on the outer coating of the eyeball may cause painful scratches and possible infections. Certain species are known to cause irritation: the mucous membrane inside the eyelids, or the conjunctiva and/or sclera of the eyeball, can become irritated, causing extreme pain. Inhalation can cause similar irritation to the lining of the nose. Padauk, poplar and oak are examples known to do this, but every individual reacts differently and some woods not generally known as irritants can affect some people.

Certain timbers are known to cause health problems. **From left to right:** Westen red cedar can exacerbate bronchial disorders; padauk dust can irritate the lining of the nose; obeche is a known cause of rhinitis

PHOTOGRAPHS: SHUTTERSTOCK.COM



FIRE HAZARDS

It is always wise to remind ourselves that fine wood dust is potentially explosive if it becomes airborne in the correct ratio of dust to air. In a small workshop this could be from using compressed air to blow dust off machines or just sweeping floors.

To become explosive, the mixture of dust in the air must be just right – too little or too much and the ratio of fuel (the powder) to oxygen does not work. For wood dust the minimum amount is 60g per cubic metre and particle size usually must be less than 200 microns. Sanding, sawing and machining hardwoods or MDF, chipboard or similar will produce this.

Wood dust explosions are interesting as they usually happen twice. Imagine a small explosion taking place in a dust collector – an uncleaned motor finally overheats and eventually becomes a source of ignition to the dust cloud it is next to. This causes a small bang and little damage, but it will send a shockwave through the workshop and all the dust that has settled on top of cupboards, shelves, pipework, etc is disturbed and mixes with the air around. We now have the secondary explosion ignited by the first small one, and that is when the workshop can be destroyed. Often this involves one or more walls being blown out and the roof structure collapsing. Brick walls take a surprisingly small force to push them out, but timber frame structures may survive.

You don't need an explosion for serious destruction. Fire in systems can be devastating and sometimes for unexpected reasons. I once went to a bakery to investigate a fire and found little evidence of fire damage, yet the MD told me it would be out of action for several financially disastrous weeks. It turned out it had an overheating electric motor that caught fire. The Fire Brigade arrived promptly and, understanding the potential for a substantial dust explosion, proceeded to spray water into all the flour-conveying ductwork, hoppers and everywhere else. We will never know if that prevented a likely explosion happening but what it did manage was to turn the cost of one motor plus downtime into two-plus weeks of closed bakery.

Did the Fire Brigade over-react? Maybe, but explosions in flour mills have been frequent and planned precautions assume they will happen. Imagine the potential for water damage in your workshop if you had a fire.

Are you likely to have an explosion? A fire is more likely and I can see a workshop at risk from a mile away. Offcuts and shavings everywhere, dodgy electrical repairs, dust on every surface, open containers of flammable liquids, contaminated cloths sitting around, open electric or gas fires and please – never, ever use a propane-fired torpedo heater. All of these are hazards, but taking simple precautions will reduce the risk of a fire in your workshop.

FURTHER INFORMATION

Further information is available from:

UK: hse.gov.uk/woodworking/hazard.htm
US: osha.gov/SLTC/wooddust/standards.html
EU: eur-lex.europa.eu
Australia: www.safeworkaustralia.gov.au

Be sure to check the standards in your country if they are not included above.

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PHOTOGRAPHS BY LOUISE BIGGS

BIRCH TABLE RESTORATION

LOUISE BIGGS RELAYS HER CRAFTY METHOD FOR COVERING UP DAMAGED VENEER

My client had inherited this birch occasional table from her parents but unfortunately it had met with an accident. A candle momentarily left unattended had overflowed and spread its wax across part of the top. Her attempts to deal with the wax had unfortunately gone through the surface veneer.

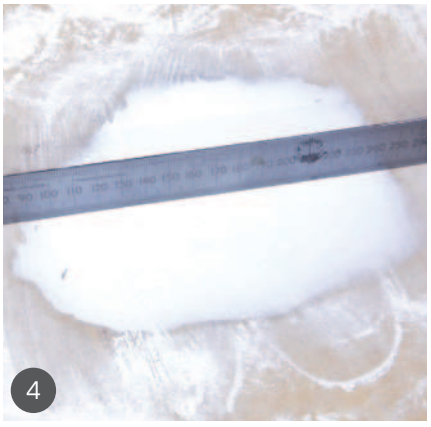
STAGES OF RESTORATION

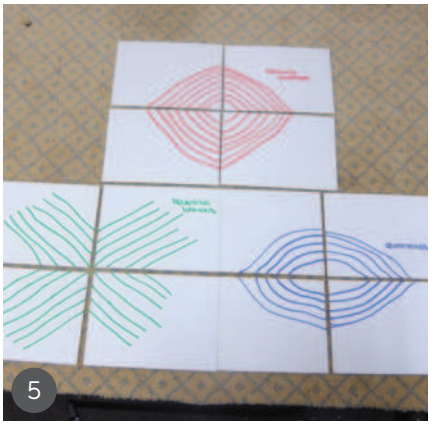
1 Having removed the top from the base and before anything else could be done, the wax had to be removed while avoiding spreading it further. Using thick brown paper spread over the top, an iron was used to heat the surface. The paper, changed frequently for clean pieces, absorbed the heated wax and, repeated enough times, the wax was slowly removed, leaving a clean top to be repaired.

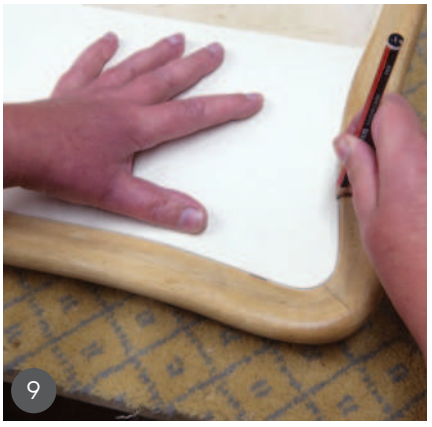
2 The damage had formed a dip in the surface, cutting through the veneer and the first layers of the plywood. Whichever repair option I took, the dip needed to be filled to prevent the new surface following the dip. A traditional decorator's filler (Polyfilla) was spread over the area, extending past the edges of the dip to ensure complete coverage.

3 Left for 24 hours to dry thoroughly, the surface was cut back to the level of the top using a cork block and abrasive, working in a circular motion and moving around the edge and towards the middle. As the filler can be abraded quite easily, using a cork block was more controlled than using a power sander.

4 A long straight edge was used frequently during the sanding process to check the filled area was level in all directions, lest we landed up back at the beginning with a dip.







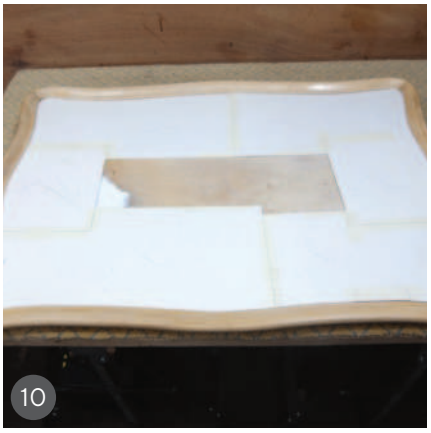
5 The shaped and moulded edge of the table was raised slightly from the table surface. I ran through the re-veneering options with the customer. One of the most accurate ways to cut the new veneer into the shaped edge would mean applying four sections of veneer and, once glued in place, cutting two joints though the middle of the top as illustrated with the card. This would have required four consecutive leaves of veneer, the grain of which could have been oriented to create one of three patterns – a diamond quarter (red, top), a reversed diamond (green, left) or quartered (blue, right).

6 As the original top was one piece of highly figured veneer the customer said she would like it to remain the same way. With the movement that would have been created in the veneer once the glue was applied, laying one piece of veneer to the shaped edge would have been difficult to create a tight fit.

7 We came to a compromise to lay the new veneer on a 2mm piece of MDF, at the expense of losing half the depth of the step on the moulded edge, but with the bonus of having a stunning piece of ice birch veneer.

8 A card template was formed, building it up in sections. This would allow the thin MDF to then be cut to a tight fit. Having rough-cut the card to shape and using my fingers as a gauge, the edge shape was transferred to the card.

9 The shape was checked against the edge moulding to assess the fit. By running a pencil against the inner moulded edge, the template could be fine-tuned to the shape and trimmed out.



10 Following steps 8 and 9 again the templates for the other three corners were formed. Each one was taped in place before cutting and shaping four pieces to fit the sides and link the corners. The whole template was then glued and taped together.

11 Having cut a piece of thin MDF slightly over size, the template was taped to the board and, using a jigsaw, the shape of the template was carefully cut out. Once cut the board was test-fitted to the table top and any slight adjustments to the shape were made using abrasive wrapped around a cork block, one side of which had been shaped to a curve.

12 The section of veneer to be used was cut from the veneer leaf slightly larger than the MDF board. Before gluing the veneer the board was rubbed over with abrasive to cut the sealed surface of the board to aid the adhesion of the glue. Using a cold press veneer glue, the veneer was applied and placed in the bag press until dry. The top was joined in the bag press by two veneered test panels for obtaining the tinted finish prepared in the same way.

13 The veneer was then trimmed back to the board before being scraped and abraded. By cleaning up the veneer first a cleaner finish was achieved, especially around the edges where they met the raised moulded edge. The veneered board insert was glued to the table top. Having satisfied myself that there were no voids within the board, the top and insert were placed back into the bag press until dry.

14 At some point my customer had stripped the dark finish from the table, cleaned it up and finished it a natural colour with Danish oil. Knowing that the Danish oil would slightly darken the veneer I applied one coat of oil to the top and test panels to obtain a true sense of the colour. Having de-nibbed the surface with 400-grit abrasive, the test panels had another coat of Danish oil tinted with yellow and red solvent stains in order to tone the new veneer to the existing colour of the moulded edge and frame.

15 With the colour of the test panels correct the top was coated with a second coat. When dry, I was still happy with the colour match, so the top had a final coat of pure Danish oil. Once the top was dry it was refitted to the table frame and ready to go home – much to the relief of the customer who had her treasured table back to enjoy.

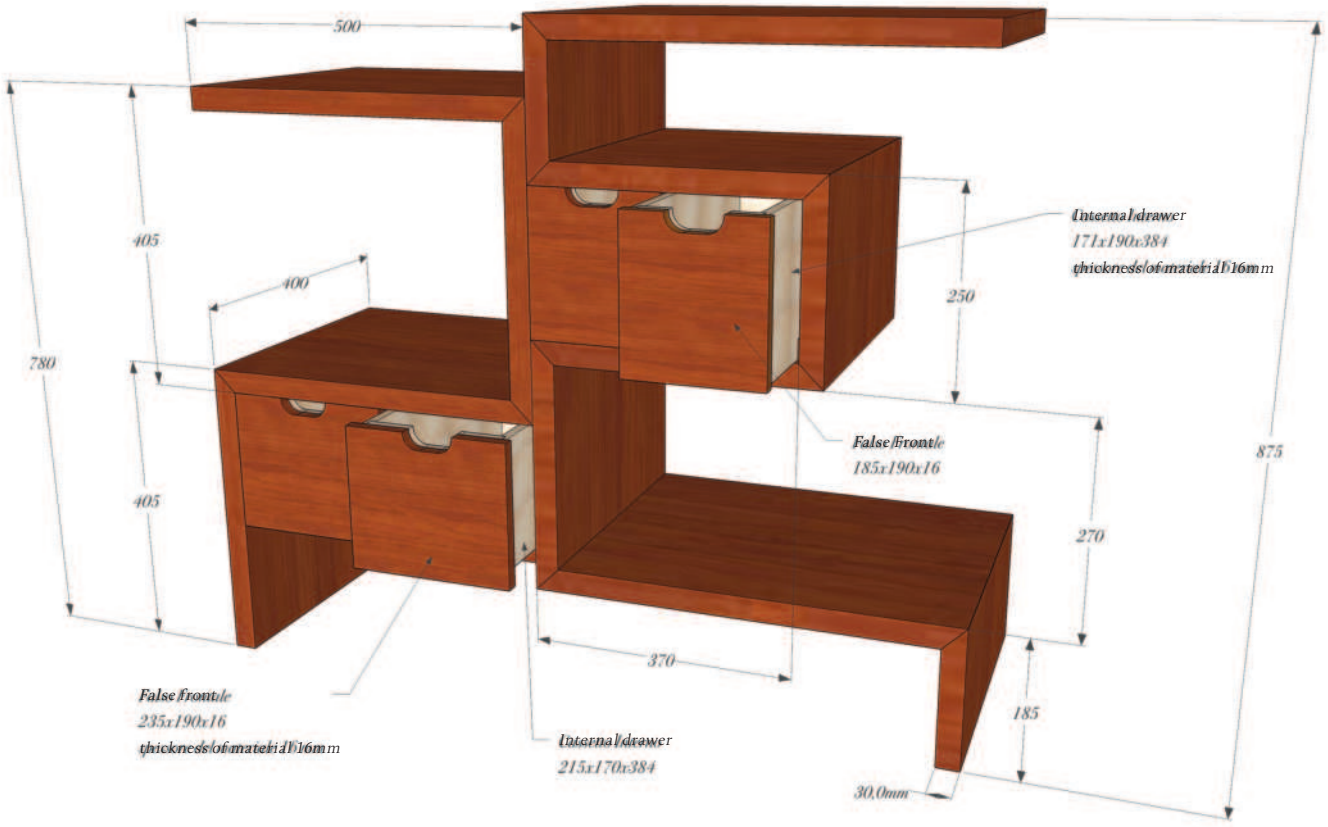
WATER AND SOLVENT-BASED STAIN CONCENTRATES

Available in a range of colours, the highly concentrated solvent stains can be thinned using various solvents and also water. They can be used to tint spray finishes and oils and they can also be used to make up stains, either water or solvent-based. They are very strong and only the smallest amount is needed to tint a finish or oil.

ZIGZAG STORAGE CABINET

FRANCESCO CREMONINI MAKES KITCHEN STORAGE WITH A DIFFERENCE

PHOTOGRAPHS BY FRANCESCO CREMONINI



MEASUREMENTS ARE SHOWN IN MM

Although common in contemporary design, zigzag furniture has deeper historical roots, dating back to early prototypes made at the beginning of the 20th century. The famous zigzag chair designed by Dutch artist Gerrit Rietveld in 1934 was a forerunner of productions of this type, and is still manufactured today by Cassina.

It may seem strange to want to make a piece of furniture using a shape that looks like it will collapse in on itself as soon as it is subjected to a certain load. However, this idea continues to fascinate furniture makers who want to use their ingenuity to make the construction easy and robust.

In fact, anyone who tries this type of work will discover that even those two aspects are contradictory to each other, because to achieve the necessary solidity, you have to complicate the construction of what appear to be simple objects.

Whether the furniture is suspended on a wall or standing on the ground like this one, the design requires all the elements to be in the right proportions. Length, width and thickness play main roles given the simplicity of the design. If the cabinet has closed compartments, then the balance and distribution of empty and full spaces become equally important factors in the success of the design itself. If the unit is to be self-supporting, then you must also take care to find a compromise between the design idea and the structural capabilities that may require a minimum thickness of the material and of the visible reinforcements.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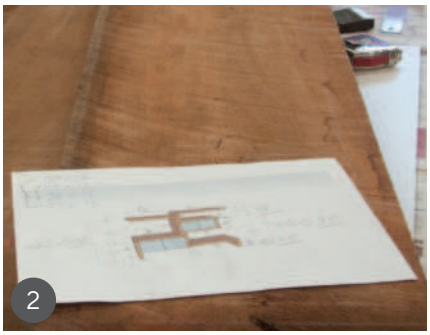
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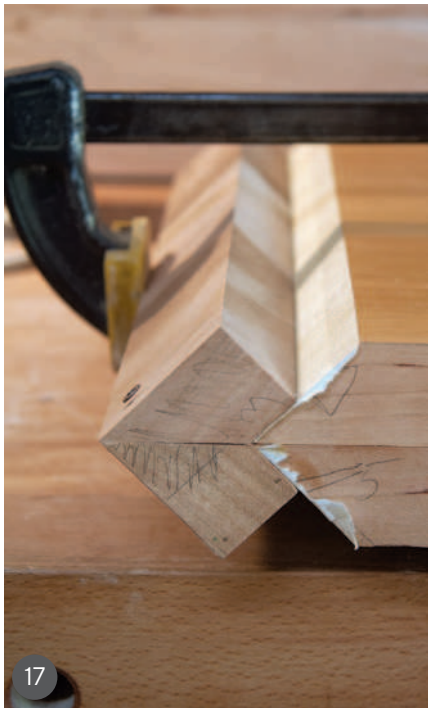


1 The raw boards are long enough to achieve grain 'run around' **2** The CAD drawing printed out so decisions about board cutting could be made **3** Rough cutting the boards but the saw must be precise for the mitre joints **4** Cherry boards glued together showing assembly pencil marks **5** A defect in one board cut out and being patched with matching wood **6** Planing a board with a low angle jack plane to remove tear-out **7** A very smooth, even surface that will need minimal finishing **8** Marking one of the inner frame components with a wheel marking gauge **9** A board with pencil edge marks showing where to make mitre cuts **10** Using a mitre shooting board to clean up the saw cuts **11** Note the saw lines and burn mark in the corner, which will be removed later **12** Two of the mitred components with markings for correct assembly **13** Using a marking stick to space out the biscuit joints **14** The jointer slots are high enough to avoid 'grinning' through the outside **15** Experimenting with coats of spray shellac to achieve the right finish **16** Marking the drawer positions ready for joint cutting **17** A rebated block used as a clamp, the tape is to keep the shellac off the ends

TIMBER

For the best effect, choose a type of wood with evident but regular grain, flamed or striped such as chestnut, ash, American walnut or elm, to name a few. Cherry was chosen here, because of the setting. The grain continuation is important, as it needs to look good at each mitre joint. Cutting sections from the same board helps retain a good grain and colour match.

Although the boards were planed and thicknessed by machine, a fore plane was used followed by a smoothing plane in order to get a better level of finish without any grain plucking.

JOINT CUTTING

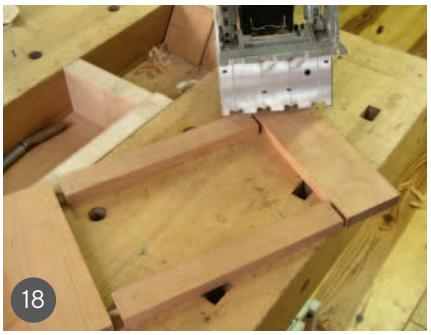
Each panel was cut to length on an accurately set up mitre saw and the cuts were cleaned up using a mitre shooting board. Then the finish was applied for a good even result before assembly and to avoid any handling marks.

Once that was done all the biscuit jointing was carried out, having first marked all the jointing locations.

DRAWERS

The design includes two closed compartments, each of which houses two drawers. Since the structure is divided visually and structurally into two, I made sure that the component parts of the two compartments also helped hold the structure together. It is difficult to find a functional and invisible system from the outside that does not steal space from the drawers. In the end I decided to rely on a frame with which to firmly secure the side to the vertical panels that originate from the compartment. So the upper fixing of the cabinet is done by screwing the internal side to the adjacent vertical panel of the left structure.

The internal space of the two drawers is divided into two halves by a frame assembled with glue and pins. The frames, which also provide the closing stop for the drawers, were preferred to panels because they have a less extended contact area and allow a better sliding surface for the drawers; for the same reason, thin wooden guides have been applied internally to the other sides of the two compartments. The drawers were made with 12mm-thick maple and have a 6mm birch plywood base. The components are held together by tongue and groove and wooden pins. The false fronts are made from cherry sapwood to give a slightly lighter appearance, with routed hand grip cutouts.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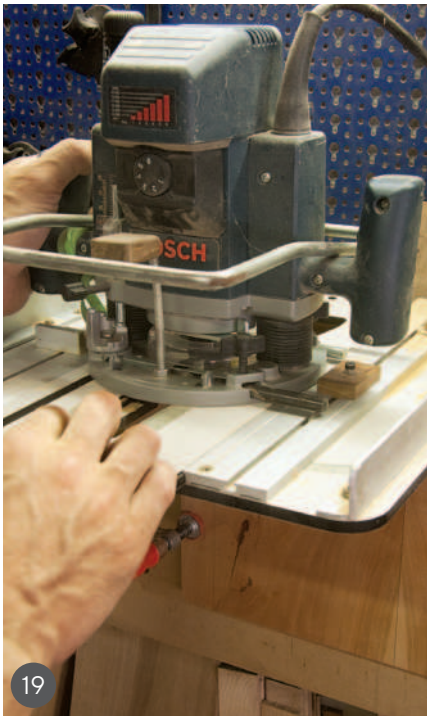
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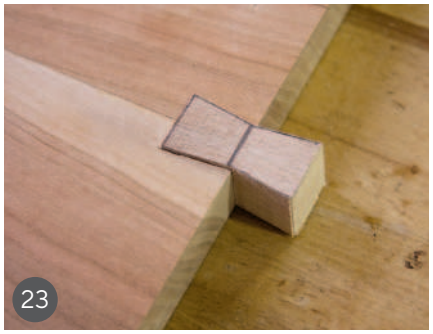
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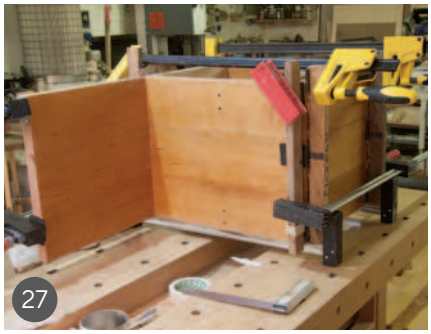
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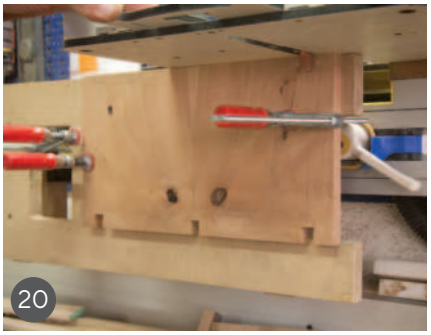
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18 A dowelling machine used to create an inner frame **19** Routing the slots for the dovetail butterfly keys holding the panels together
20 Two frames are held with clamps and fixed between the horizontal panels **21** The WoodRat router is an easy way to make very precise joints
22 All the components jointed and sanded ready for the shellac to be applied **23** A test fit for a butterfly key, so far so good
24 The tongue and groove drawers are held together with cherry wood pins **25** Detail of the front corner drawer rebate and the false front added on
26 Gluing up the first subassembly, two more to go before it is complete **27** Clamps and blocks hold the second subassembly, note the dowel holes
28 Carefully peeling away the surplus glue from the shellac finish **29** Accurate alignment with a spacer is important for a good result
30 It's all beginning to make sense, both major halves clamped together **31** Fitting a dowel into place to help hold it all together
32 The small intermediate panel can now be keyed into place **33** Finished nice and flush, now the assembly spacer can be removed
34 The last drawer compartment can now fit in to place **35** Time for a final rubber-applied shellac coating before delivery

GLUE-UP

Dry assembly is indispensable to check all the joints and biscuit slots but also to establish how to arrange the pieces and the clamps on the bench and whether to split the operation up. I managed to glue the entire left half in a single session but divided the right half into two subassemblies. All the elements had to be clearly marked so as not to confuse their order during glue-up. The first assembly had the purpose of checking the relative position of the two halves, checking the square at the contact points, and working out the position of the fixing points of the add-on top for the left chest of drawers. The rest of the assembly then followed.

COMPLETION

This piece of furniture would be subject to the impact damage of a normal working kitchen so I used a 3mm radius cutter to round off all the edges, done freehand with a router. After waxing the internal sides of the drawer compartments, the cabinet was installed and ready for use.

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UNDER THE HAMMER

TUDOR-ERA FURNITURE ACHIEVED HIGH PRICES AT BONHAMS' OAK INTERIOR SALE IN OXFORD. WE LOOK AT THE TOP-SELLING PIECES

LOT 136
£62,562
An exceptional, rare Henry VIII joined standing 'Great Hall' cupboard, made circa 1540. The oak boards are profusely carved with two designs, a large flower-filled lozenge and a saltire, and are further embellished with punched decoration and carved leaf-and-berry spandrels. Each eight-panelled side is topped by two similar lozenge-carved panels above two lancet-pierced panels. Unusually, the lancet piercing is repeated on the muntin rail below. The cupboard's interior shows signs of the original carpenter's marks.

LOT 97
£40,062
A splendid Elizabeth I joined oak canted standing livery cupboard, made in the West Country, circa 1580. The cupboard is accessed by a central boarded door, which is carved with a lion passant with its right forepaw raised. This is flanked by a panel decorated with a pointed-leaf and acorn carving, and palmette-carved side panels. The impressive cup-and-cover front supports are decorated with reeding and palmette carving.

LOT 131
£25,062
A rare joined oak folding-table with box top, made in England, circa 1540–80. The 20-sided top is formed of two parts, one part hung at the back and supported by a hinged gate, the other enclosing a well with three dividing boards forming six divisions. The frieze is carved with a pattern of large concentric ring roundels, and has a rope-twist lower edge. The table is raised on a shaped-bulb and baluster-turned central front leg and rear rectangular-section legs, joined by a plain T-shaped stretcher.

▲ LOT 77
£20,062

An impressive Elizabeth I joined walnut, oak and parquetry-inlaid canted court cupboard, made in Dorset, circa 1590. It has rare pierced 'lantern' style feet. The front frieze includes two fully parquetry-inlaid reserves, leafy-carved corbels and lunette-carved sides, placed on open cup-and-cover end-supports, each with a variety of reeding and palmette carving and Ionic capital. The central door and sides of the canted cupboard are framed by navette-carved rails and centred with parquetry inlay. The long drawer below is lunette-carved with fleur-de-lys terminals, on similar turned and carved front supports, joined by an open undertier. The cupboard was once part of the collection of American publishing tycoon William Randolph Hearst.

▼ LOT 308
£43,812

The 'Hornby Castle' open armchair, made in south-west Scotland, circa 1580–1600. This oak chair has an unusual design, having an open back formed of two twin-arcades with fluted-baluster pillars, below a tall cresting. The relatively flat arms are carved with a cabled nail-head design, on bulbous basketwork-carved supports. The seat rails, front legs and stretchers are similarly carved. The carving is thought to include the coat of arms of the Conyers family of Hornby Castle, Yorkshire.

◀ LOT 116
£37,562

An extremely rare Elizabeth I oak 'Glastonbury' chair, made in the West Country, circa 1570. Despite its appearance, the chair cannot actually fold, instead it was constructed using removable pegs and was designed to be taken apart and reassembled, in the manner of campaign furniture. The raked back is made of three boards, which are carved with guilloche-filled arches, a typical feature of these chairs. Unusually, however, the centre features a defaced shield framed by well-carved floral scrolls. The shield probably featured a coat of arms at one time. Each back upright has multiple fine run-mouldings and integral pyramidal-finial. The arms feature accentuated raised elbow-rests. The seat is formed of two boards grooved into run-moulded side rails, and with hand-shaped 'rod-form' front and rear rails.

PHOTOGRAPHS COURTESY OF BONHAMS

PHOTOGRAPHS BY ANTHONY BAILEY/GMC PUBLICATIONS

STAND-UP VICE

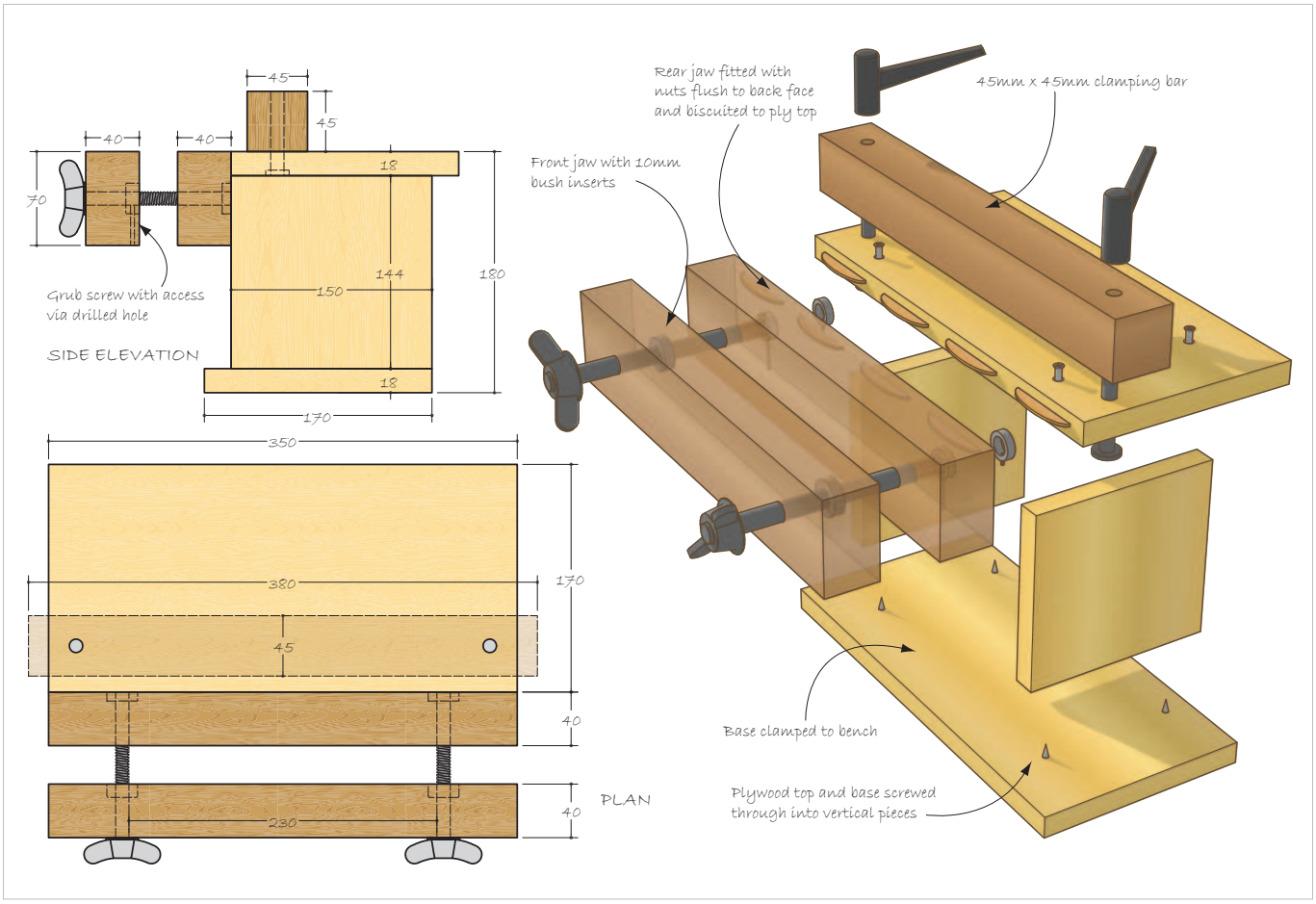
HOW MANY TIMES DO YOU HAVE TO BEND DOWN TO CUT ACCURATE JOINTS? YOU DON'T HAVE TO, IF YOU BUILD A 'STAND-UP' VICE LIKE **COLIN SULLIVAN**'S DESIGN

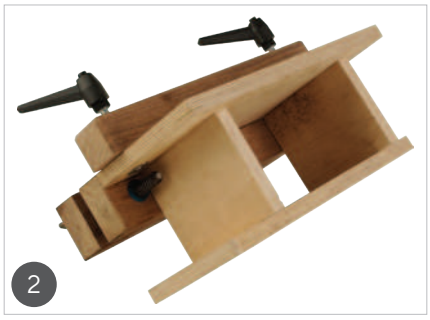
This simple bench top vice allows you to do fine work, like dovetail cutting, at a more sensible height than a conventional bench vice. With the work raised it is much easier to saw accurately and follow the marked lines of joints. I believe this jig will help you achieve a better result with your joints.

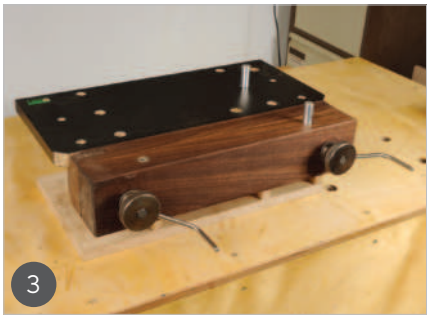
CONSTRUCTION DETAILS

The jig can be made from any hardwood offcuts lying around the workshop. I used walnut leftovers for the vice jaws and 18mm birch ply for the top and the underframe. The two screws are salvaged from two old 150mm G-clamps that were no longer being used, which turned out to be ideal. I began by cutting off the pressure pads at the end of the screws to release them from the clamps and then sawing off the threaded part of the cast-iron G-clamp to act as receiving nuts. I had to decide how wide I want the vice to be: 230mm between the threads was ample for the work I do, but you may want to make it wider. The renowned Moxon vice is very good, but enormous and very heavy, for a jig that is only used occasionally. I marked where I wanted the screws and then clamped the jaws together, drilling a hole through both pieces big enough for the G-clamp screws to pass through. I then counterbored and fitted the two nuts flush with the back of the jaws.

Two plain bushes as shown on the drawing hold the front jaw in position for opening the vice. Even the Moxon vice does not have this and you have to withdraw the front jaw each time you open the vice, I believe. Now the jaws were made and working, I fixed the top piece of ply flush with the top of the rear jaw using biscuit joints between the two, then glued up and checked that the face of the jaw was square and flush to the top panel. After







the glue had set properly, I put the front jaw on using the two G-clamp screws and planed the vice off flush to the top panel. One piece of 18mm ply was needed for the baseboard, which is used for clamping the whole vice to the bench top. The two upright pieces of 18mm ply were cut to approximately 130mm high, although it isn't critical. All the components were then glued and screwed together as shown on the drawing. The clamping bar on the top panel is 45 x 45mm in section and held with two 10mm-diameter threaded Bristol lever screws into two 10mm star sockets driven in from under the top.

VICE USES

Clamp the vice to the top of your bench to begin with, put a piece of wood about the size of a drawer side in vertically and make a few cuts on the end to get a feel of this new raised position for sawing. The clamping bar can be used for holding the work when marking the pins against the tails when dovetailing, and the square face of the bar can be used to pare up against when making the pins and tails. It is also useful for holding quite thin pieces of wood to plane edges.

1 The stand-up vice clamped to the workbench with the optional top clamping bar in position
2 A rear view showing the simple construction of the vice
3 The Mark II with lever handles and dogs for flat clamping, or it accepts a top clamping bar

WANEY EDGE DESK

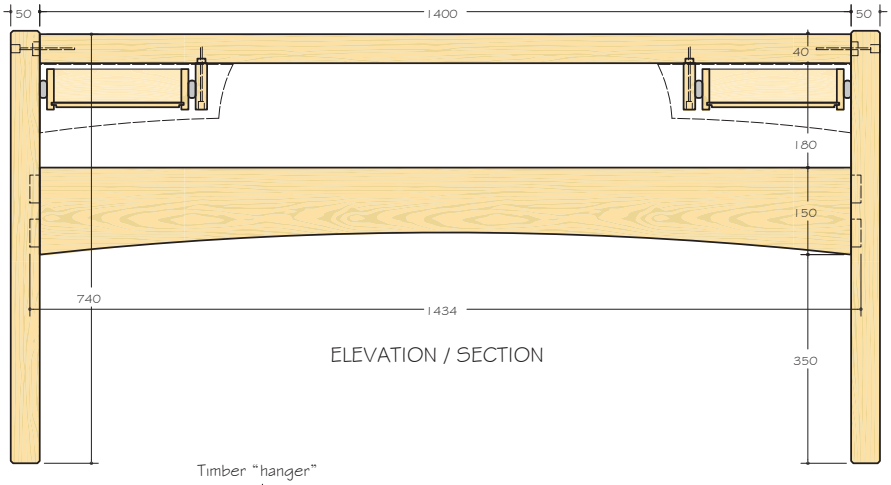
BRENDAN DEVITT-SPOONER HAS A LOVE OF HOMEGROWN TIMBER, AS EXPRESSED IN THIS BEAUTIFUL DESK

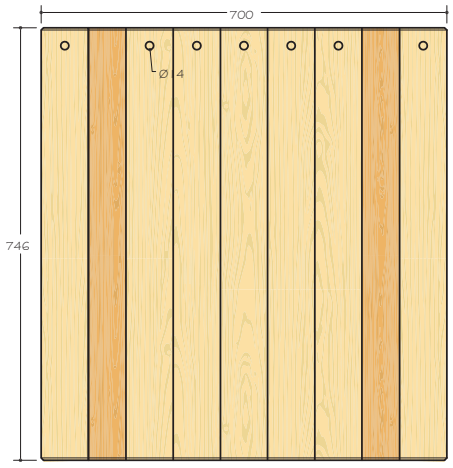
This desk came about when a client visited my workshop: they wanted a desk but didn't have any preconceived ideas on what it should look like. Looking at some of the pieces in my showroom they expressed a preference for a natural edge to the top. As luck would have it I had some ash from a tree we took down about 18 years ago. One of the planks turned out to be ideal – wider at one end, no splits or shakes and to clinch it, it was a single slab that had stayed flat.

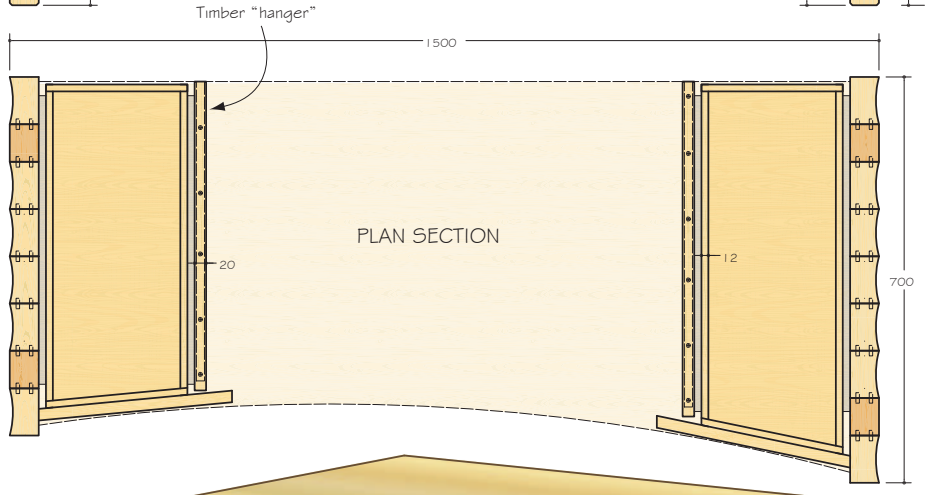
ENGINEERING NATURE

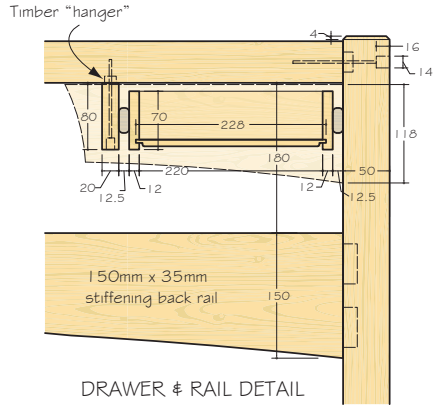
Other than a request for the desk to have two drawers, the design brief was open-ended, which allowed me freedom to consider different ways to make the desk. Rather than continue the theme of natural edges, I decided to contrast the edge with engineered ends, which highlighted the wavy-edged top. The two drawers were placed one at either end and to mirror the top they would have to have angled fronts. With any desk, or table for that matter, it is a given that it should be rigid and not move when in use. With the top only joined to the sides it was necessary to have a large stiffening rail to restrain any movement.

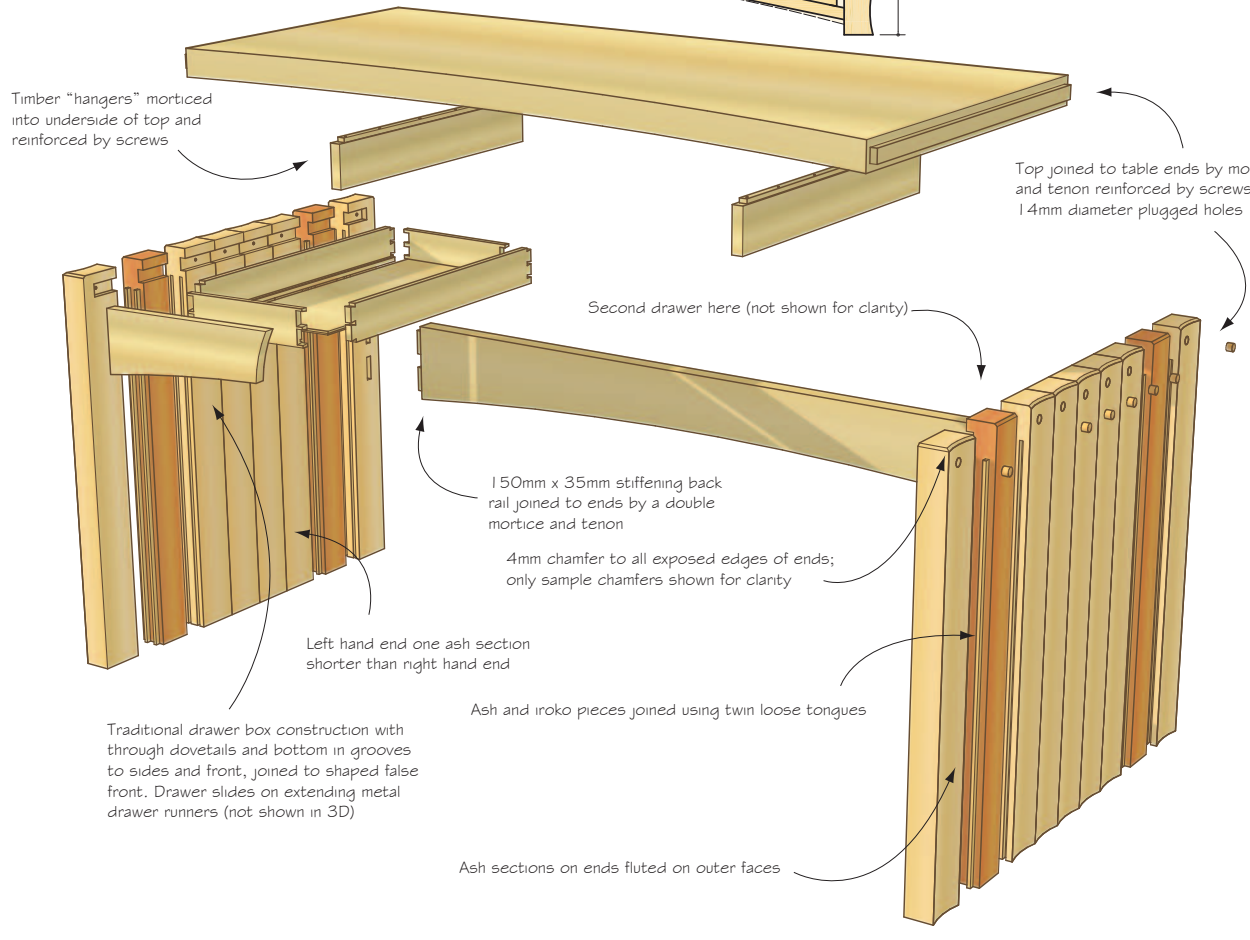
With the drawing of the desk accepted by the client, the timber was prepared. The top had been in the workshop for many years so it was acclimatised to a warm setting. The remaining ash and the contrast timber, which was iroko, had also been in the workshop so could be worked immediately.


50
1400
50
40
180
150
740
1434
350
746
ELEVATION / SECTION


700
Ø 4
SIDE ELEVATION


Timber "hanger"
1500
PLAN SECTION
20
12
700


Timber "hanger"
4
16
14
80
70
228
118
180
220
50
20
12.5
12
12
12.5
150mm x 35mm
stiffening back rail
150
DRAWER & RAIL DETAIL


Timber "hangers" morticed into underside of top and reinforced by screws
Top joined to table ends by mortice and tenon reinforced by screws in 14mm diameter plugged holes
Second drawer here (not shown for clarity)
150mm x 35mm stiffening back rail joined to ends by a double mortice and tenon
4mm chamfer to all exposed edges of ends; only sample chamfers shown for clarity
Left hand end one ash section shorter than right hand end
Ash and iroko pieces joined using twin loose tongues
Traditional drawer box construction with through dovetails and bottom in grooves to sides and front, joined to shaped false front. Drawer slides on extending metal drawer runners (not shown in 3D)
Ash sections on ends fluted on outer faces

PHOTOGRAPHS 4-7 BY BRENDAN DEVITT-SPOONER

1 The curved back rail is low enough to be a highly visible feature **2** View of the rear of the drawer showing the outboard drawer hanger
3 The loose tenon construction and fluting detail on a desk end **4** Forming the trench to locate the desk top into the ends
5 All joint machining on the desk ends now complete

SHAPING THE TOP

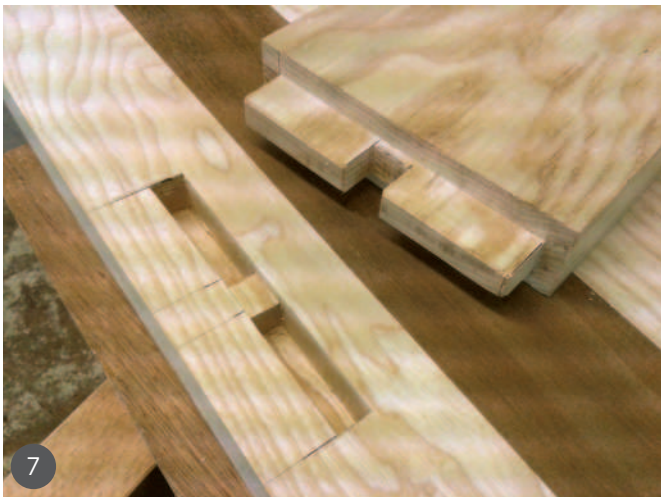
As the top of the desk would be the main part of the design I worked on this first, mainly because all the other dimensions would be based upon the end lengths. As the top was rough sawn, the first job was to flatten it. Using a wide-belt sander made the job much easier and resulted in a beautifully flat slab. I established a straight rear edge and the two ends were then crosscut to give the maximum length possible.

LOOSE TONGUES

Now that the top dimensions were finalised, I could work out the sizes for the ends. Allowing for a small protrusion at front and back, the widths of the pieces that made up the ends were determined. Each end was made up from ash pieces measuring approximately 75 x 50mm. The two pieces of iroko at each end were 65 x 50mm. These were joined together with twin loose tongues. The ash pieces were fluted to give the ends an engineered sculptural look.

Before any jointing was attempted each end was laid out to establish the most attractive composition of grain patterns. Because these faces would be reshaped I marked the back with a large pencil triangle to ensure they would go back together in the correct order.

As with many woodworking processes, there are invariably more ways than one to achieve a result. Using a spindle moulder, I cut all the grooves with a 6mm groover. Considering that a



PHOTOGRAPHS BY GMC/ANTHONY BAILEY UNLESS OTHERWISE STATED

6 Mortises squared out with chisels to accept square tenons **7** The rail tenons checked for fit in the mortises
8 All screw holes drilled and the joint ready to fit together **9** A stool was just the right height to act as a work support

groove through a top would not look too good, I made sure that each piece had a top mark to remind me to stop the groove.

FLUTING

The next major operation was to form the flutes on the pieces of ash. Again this was done on the spindle, using a dedicated cutter. The iroko pieces were not fluted. With all the preparation work done on the ends, all that remained to do was cut the plywood tongues to length and shape one end to complement the curve produced by the grooving cutter. By using a 6mm grooving cutter, inserting the birch plywood tongues necessitated planing them slightly thinner to allow them to fit with a little room for expansion due to the water in the glue.

GLUING AND SANDING

As with all gluing up operations, preparation was vital. Getting halfway through a glue-up and finding that one of the ply tongues was too wide or thick is not good. Laying out the sash cramps with scrap wood pieces to protect the edges, each end was dry cramped. Checking that all was well, I glued up each end and also made sure that each end was flat to the cramp bed.

After the ends had dried, each was passed through the wide-belt sander to flatten off the inside flat surfaces and lightly run through on the fluted side. Before any jointing could take place the ends were sawn to length, in this case 746mm. After jointing this would allow for a small up-step from the top height of 740mm.

10 Very long single flute screws will hold the desk tightly together **11** A ratchet driver with a Torx bit makes assembly quick and easy **12** The rail needs to go in place before the end is tightened up **13** Now for the side-mounted drawer runners to complete the desk

TONGUE AND TRENCH

To join the ends to the top I simply used a tongue and trench. The trench was formed by a 16mm straight cutter in a portable router to a depth of 12mm. The corresponding tongue was formed on the ends of the top, making sure it was not too tight in case it weakened the short grain above the trench. It was also only 11mm, long to allow for any excess glue.

SCREW ASSEMBLY

To reinforce the joint I decided I would screw the ends to the top. The ones used were 100mm long with a hexagonal head. The important consideration was to ensure that the head diameter or the integrated washer diameter was smaller than the hole into which a tapered plug was going.

The screws would go through the centre of the joint and each hole would be centred on each piece of ash. A 14mm hole was bored to a depth of 16mm, after which a clearance hole then went all the way through. With the whole thing dry cramped, a pilot hole was drilled into the top for each screw.

Before inserting the screws, a small bit of wax was smeared on to the threads to make insertion easier. Rather than put in all the screws, I only put two at each end. This would allow me to put the remaining screws into virgin wood when it was finally assembled. What I found useful at this stage was to have a support under the top which would help me to assemble it quite easily without having to wish I had three pairs of hands. A high stool with a few magazines did the trick.

14 The traditional slide-in base and a single screw to locate it **15** An angled desk front and the interest of the 'rubbed through' waney edge above it **16** The fluted ash ends with contrast iroko strips and detail buttons

STIFFENING RAIL

With the top and ends together, attention was focused on the stiffening rail. This, simply, was a 150 x 35mm piece of ash that was double tenoned into each end. The position was not critical, although I felt it looked better nearer the top. The mortises were formed with a 12mm cutter in the router. The tenons were produced on a tenoner, although I could have quite as easily cut them using a bandsaw.

One essential consideration to note was that the length of the shoulders on the rail were identical to the length of the top. Rather than leaving the rail straight, I decided to curve the underside to mirror the natural curve on the top and the flutes on the ends.

DRAWER RUNNER SLOTTING

Before the final assembly, the only other necessary operation to do was form the trenches for the two hangers on which the extending drawer runners would hang. These again were formed using a 16mm straight cutter, making sure they were parallel to the ends. The two hangers were fitted and secured by screws into a series of holes and slots which would allow for any subsequent movement of the top. I am pleased to say the desk was very well received by the client!

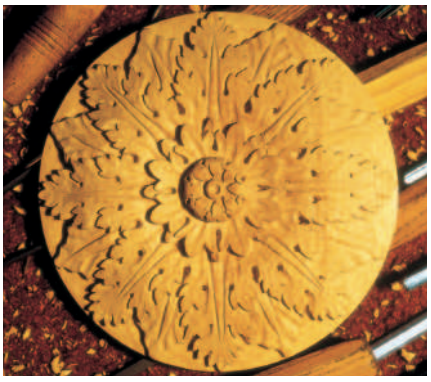
PHOTOGRAPH: SHUTTERSTOCK.COM

INCISED AND APPLIED ROSETTES

FREDERICK WILBUR CARVES DECORATIVE FLOWERS

Rosette is a general term for a round or ovoid depiction of a flower. A few geometrically abstract chip-carved incisions may be called rosettes, but usually rosettes are recognisably flowers, with a central disc and petals, with or without leaves radiating outwards. Some rosettes are highly modelled and undercut, and may have other natural objects, such as shells and birds, among the foliage. Paterae (patera, singular) are circular, relatively small, evenly spaced decorations on frieze or architrave, often in the form of a plain disc or a simple flower.

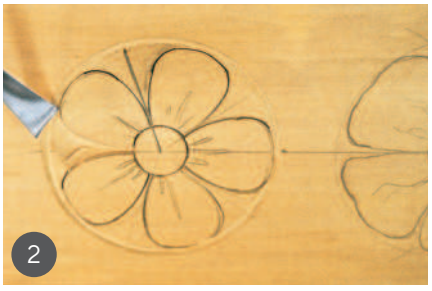
Rosettes are found in many situations where a square or rectangular space is defined by surrounding elements. They are found in the metopes of the Doric frieze, in coffers of a vault or ceiling, and in door panels. They often occur in the square space created by the intersection of flat mouldings, as on crossetted picture frames, overmantels and door architraves. They sometimes form an element within another design, such as the guilloche or the volute. They are sometimes also found on the necking of the Roman Doric order. On furniture, rosettes can be found on plinths, pilaster blocks and the square parts of turned table legs; they are also used to terminate scrolled sofa arms and scrolled pediments.

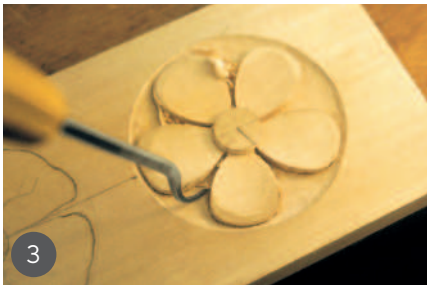


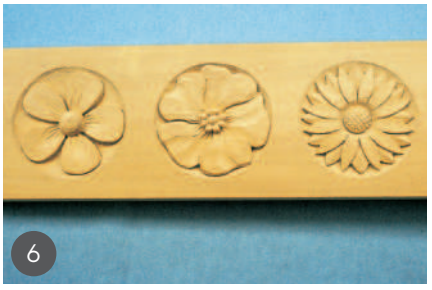
Circular rosette of low-relief foliage

A set of plaques with incised oval rosettes

An elaborate high-relief rosette with shells between the leaves







PHOTOGRAPHS BY GMC PUBLICATIONS

1 Setting in the incised rosette **2** Grounding between the petals with a fishtailed flat gouge
3 Cleaning the ground between the petals with a narrow grounding tool; a ground-down nail is an acceptable substitute
4 Rounding the central disc with an inverted gouge **5** The incised rosette completed
6 Three variations on the simple incised flower; the right-hand example boasts a second layer of petals

CARVING AN INCISED ROSETTE

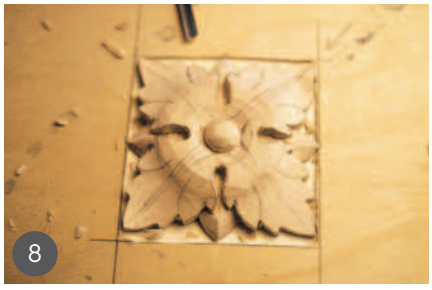
The first stage in laying out the incised rosette is to divide the circle into the required number of sectors; extend the division lines beyond the circle so that they can easily be redrawn if necessary after carving has begun.

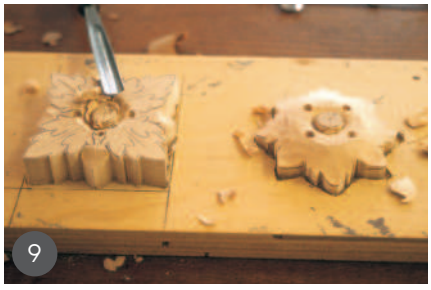
Define the outer circle with a parting tool and use a gouge of the appropriate radius to set in the centre circle, the disc of the blossom. The example here has a dished ground; alternatively, the outer circle could be set in perpendicularly to the surface (or routed) to gain more depth. The parting tool can be used to define the petal divisions, but setting in with vertical cuts gives clearer definition. At the outside edge, care should be taken not to stab too deeply. Stab in the ends of the petals.

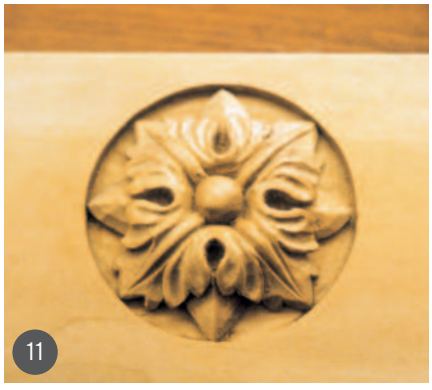
Fishtail gouges are useful to take the ground (such as it is) down around the petals. Care should be taken to leave no ridge between the original parting tool circle and the finished ground. If you do not have a sufficiently narrow grounding tool, a small cut nail, ground to the appropriate width, can be used to clear the narrow space between the petals. It may be necessary to set in again at this point: the ground should be sufficiently deeper than the petals to make the flower appear to float on the dark shadows behind it.

Slope the petals towards the centre disc and round over the disc. The edges of the petals should be slightly bevelled and the petals veined at the centre.

Undercutting is not necessary. Though the petals can have more swagger or character if desired, naturalism is not the primary goal here. Photo 6 shows some possible variations.







7 The carving sequence for applied rosettes: designs traced on the board

8 The shapes have been cut out on the bandsaw or scrollsaw and are held in routed recesses on waste board. The cross-sectional shape is defined first, beginning with the central dome

9 The leaves are set in and the tips of the under leaves lowered

10 The square rosette completed and set into its recess; undercutting of the leaf tips is clearly visible

11 The round rosette set in its recess

12 A strongly undercut rosette within an oval recess

CARVING APPLIED ROSETTES

In many uses the rosette is carved independently from the structural members of the piece and subsequently applied to the surface.

The two rosettes described in the following sequence illustrate how the round design can be stretched to fill a square space (the width of the latter being the same as the diameter of the former). Photo 7 shows the two designs marked out on the wood before being bandsawn to shape. To hold the sawn blank, a recess is routed into waste stock and several small brads are driven into it; the heads are snipped off and the blank is pressed on to them.

Carving begins with establishing the sectional profile. The hemispherical or domed central disc is shaped first. From this, the leaves spring up and then flow to the background in a cyma or reversing curve. Sometimes, as in a Tudor rose, petals or leaves, especially when confined by a bordering circle, may curl back towards the centre of the rosette.

The eyes are drilled next, to establish the divisions between the leaves. The leaves are set in – that is, shaped in silhouette – and the secondary leaf tips are relieved in order to define the main leaf. The smaller, overlapping leaflets are set in, then the veins and the surface modelling complete the design.

Finally, a slight undercutting of the bottom leaves brings the whole rosette off the surface background. This can be quickly done with a knife after extricating the rosette from its holding board. To further enhance the appearance of depth, the rosette is sometimes let into a recess. Photo 12 shows a more elaborate variation in which the recess, edged with a cavetto moulding, creates strong shadows to show off the delicate undercutting.

To produce small discs for 50mm or smaller rosettes, a hole saw mounted in a drill press and without its centring drill can be used. Use stock that is a little thicker than the depth of the saw blade, so that the discs don't jam in the saw. The stock must be firmly secured to the drill press table. The discs can be popped out or quickly sawn out on a bandsaw.

A SUSTAINABLE FUTURE

SEAN SUTCLIFFE OF BENCHMARK TELLS *F&C* ABOUT HIS FIRM'S COMMITMENT TO SUSTAINABLE FURNITURE MAKING

Benchmark was founded by Sean Sutcliffe, a graduate of Parnham College, and Sir Terence Conran. From an initial team of just three people, the workforce has expanded to 70 skilled craftspeople, with workshops in Berkshire and Dorset. We work with many of the world's leading architects and designers on high profile bespoke commercial projects as well as producing our own furniture collection. Our focus on craft, materials and quality ensures we can offer customers furniture that will stand the test of time. In striving to help customers create healthier and happier homes and workplaces, we look to simultaneously reduce its environmental impact as a company.

PHOTOGRAPHS COURTESY OF BENCHMARK FURNITURE

A HISTORY OF SUSTAINABILITY

For the past 35 years we have collaborated with a variety of partners to drive our mission of sustainability forward. And today, especially in this critical time, we have taken it upon ourselves to ensure we work towards an increased knowledge and awareness of global impact. With a transparent approach, we aim to be open with our sustainable journey, encouraging this mindset among others.

Through our continued efforts to be at the forefront of the industry, we are looking to set an example in creating a sustainable option for consumers without any compromise on design and quality. We believe that through collaboration and a sharing of knowledge we can participate in a positive future for the furniture industry.

ACCREDITATIONS

Being one of the first UK furniture makers to receive both FSC and PEFC accreditation and twice winners of the Queen's Award for Enterprise in Sustainable Development, we are continuously working to adhere to expectations and try to always be accountable for our actions. Alongside our ISO 14001 certification, we are also providers to WELL certified projects. The WELL Building Standard was launched in 2014 and focuses on the health and wellness of people in interior environments. Factors such as air quality, light sources, materials and thermal comfort are considered to make way for calmer spaces and positive impacts on the mental and physical health of inhabitants. We are proud to be a furniture provider for WELL certified buildings and align ourselves with the qualities they require.

MATERIALS

In developing new collections, we are opting for natural materials over synthetic alternatives. We select natural, non-toxic and biodegradable material options including organic wool, coir, natural latex and recycled denim. Not only do these have improved environmental qualities, they also encourage a healthier atmosphere in the home, as well as being naturally fire-retardant.

The forests from which we source timber are all sustainably managed, encouraging a positive impact on climate change with the replanting of trees and maintenance of biodiversity. The finishes we use are low VOC oils developed from natural materials, again contributing to our drive away from the use of toxic materials within the home and workplace. We encourage the use of local suppliers of materials where possible to reduce the carbon footprint in a product and do not work with endangered species of timber.

It is our aim that all our core collections will carry Declare labels – an international specification providing consumers with honest details of the materials we use. By doing this we request the same level of transparency from our suppliers.

CIRCULAR MINDSET

Our goal is to become an innovative enterprise with a circular mindset in every aspect of the business. No waste from our production goes to landfill and any surplus timber is repurposed into smaller components and accessories, or as fuel for energy used within the premises. All kitchen waste is composted on-site, and we work with local waste specialists to recycle uncommon plastics and materials. Our packaging is created from recycled materials and we have substituted plastic foam with a biodegradable corn starch alternative.

Q&A
WITH SEAN SUTCLIFFE AND ANTHONY BAILEY

We featured Benchmark and the 11.4m long oak table you created for the 2011 London Design Festival in issue 186 of* F&C*. What kind of spin-off or effect did that project have on the company?
It is still taking up a 47-foot bay in our warehouse. It was a way of demonstrating not only our craftsmanship but also our ability to deal with difficult and complex design problems. It is always difficult to directly attribute enquiries to specific activities. We are continually approached for challenging projects that other woodworkers are not willing to take on. Therefore, we might say that it has played a part in positioning Benchmark as a company which relishes taking on projects that will challenge our creativity and build our knowledge base and expertise.

Have you created any other interesting or unusual speculative pieces since?
We have worked on a number of projects over the years with the American Hardwood Export Council which are always extremely rewarding. The latest was Legacy, which was showcased at the V&A during last year's London Design Festival.

This project brought a diverse array of challenges into the workshop and we were given two weeks to create 10 entirely different pieces, challenging both the creative ability and technical skills of our team. Since the brief was to work with red oak, Legacy has also enabled us to learn more about this material through a week-long series of experiments on its qualities and characteristics. It has been a pleasure for us to show the beauty and potential value of red oak, a timber species that is in abundance yet not often specified.

How would you say the company has evolved in the past 10 years?
We have gone back to nature. For the past 35 years, we have been focusing on our mission of sustainability and we are now turning our attention to the impact that our furniture has on human health and wellbeing, as well as on the planet. We are focusing our attention on natural products and turning our backs on high-impact manufactured materials. There has been a huge amount of effort to ensure that all the materials we use are sustainable and healthy, from the fillings of our upholstered pieces to the finishes of our timber. We have also invested in the Declare Labelling and Environmental Product Declarations, with the aim of encouraging similar actions by the rest of the industry and making it easier for architects and designers to specify the right materials. Last year we launched the Sage Collection with American designer and architect David Rockwell, which not only meets the WELL Building Standard but goes beyond it.

We keep hearing about skills loss in education. Has Benchmark been able to recruit people with the right skills?
Yes, but it's getting harder. The apprentice levy seems to have had the opposite of the desired effect, with apprentice applications in all areas being declined. Luckily for us, our apprentice programme is recognised as being successful and we do still attract a good level of applicants.

What are the minimum requirements you expect from apprentices who join the company?
The heart of a craftsman.

How do you see the future of the furniture industry in the UK?
I think the best of what we do in the UK will survive despite Brexit uncertainty. London seems to be buoyant, so the contract market should provide opportunity for the best of our makers. I believe the future will look good for those who lift their eyes to the international market and to those who make quality of design and manufacturing a priority.

Do you think that exiting the EU will have a positive or negative impact for Benchmark?
That is still uncertain but we are not planning to sit back and wait. We are actively pursuing international business and have completed some very large projects in the US where we are able to offer superior craftsmanship and represent very good value for money.

Are there definite design trends that you have to react to meet?
There has been a stronger focus on natural and sustainable materials and an increasing knowledge of the role that design and materiality has on how we feel, on our productivity and our interaction with others. This has translated in our brand making furniture that goes beyond only removing negative values to us seeking ways to add positive benefits to the health and wellbeing of the users.

How are recent advances in materials and finishing affecting the way you design and build furniture?
We've stopped using MDF because we feel that is a material with toxic connotations, leaving us with the interesting dilemma of how to replace it. We are currently using interesting and innovative board materials produced from straw. The continued advance of polyx oils has enabled us to move away from use of plastic lacquers.

The biggest change of all has been in the development of natural upholstery to replace plastic foams and toxic fire retardants. With leather coming under question because of the environmental impact of the beef industry, we're looking at some interesting alternatives, particularly a pineapple-based product.

There are various steps in the whole process of designing, sourcing, manufacturing, delivering and end-of-life that your company are obviously having to address to sustain and protect the environment. Do you feel you can meet all those objectives within a realistic timeframe?
We have always looked to sustain and protect the environment, so we stand on a strong base. However, there is still more that we can do and we are constantly reviewing our processes and researching alternative materials to ensure that we are using the most environmentally friendly ones. As mentioned this includes the development of natural upholstery, which uses natural latex, coir and sheep wool instead of polyurethane foam, which is pumped full of toxic chemicals; we have just switched our ply supply for a reduced VOC level; we are researching alternative natural materials for leather and developing our own naturally fire retardant fabric collection; we have introduced corn starch packaging; we have introduced a take back scheme whereby clients can return unwanted furniture and we will repurpose it – and these are just a few!

The state of the environment now seems to be one of the biggest issues facing our planet. Why do you believe Benchmark needs to focus on this subject so much and do you think it will inspire other companies to follow suit?
We all want a sustainable, healthy and beautiful world for future generations. Every day we hear about the Climate Emergency. The challenge seems so big and the urgency ever greater but we can't allow the enormity of the task to deter us from taking our first seemingly inconsequential steps. Construction and operation of buildings and interiors are the biggest contributors to our carbon emission and global warming. Therefore, those of us who design, build and fit out these buildings can really make a big difference. Our stance is that we must challenge the way that WE do things and try to educate and inspire others to follow.

benchmarkfurniture.com

UNDERSTANDING JAPANESE WATERSTONES

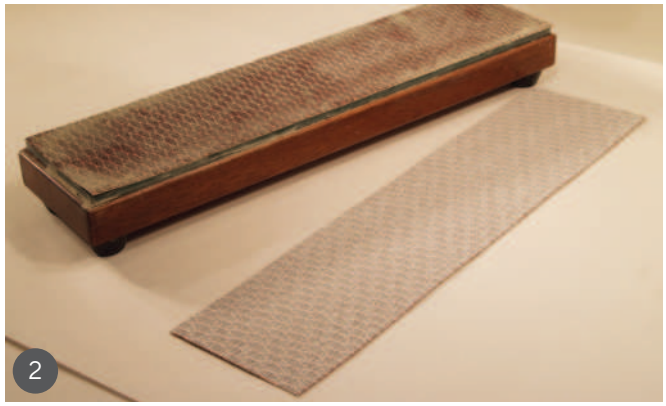
MICHAEL HUNTLEY SHARES HIS SHARPENING TECHNIQUE

PHOTOGRAPH COURTESY OF CLASSIC HAND TOOLS

In this article I am going to tell you how I use Japanese waterstones and why I do certain things. I cannot say that this is the correct way, but it is the technique I have developed over the past 25 years and it works for me.

The process is messy, so why do it? Because it works, it's relatively cheap and because it is slow so there is no danger of losing the temper of the steel. Finally, I find it the easiest and cheapest way of honing at 1.5 microns. Even if you use diamond plates so you have no issues with flattening the stones, you will find it hard to beat the final polish that an 8,000 or 10,000-grit waterstone gives.

LEFT: Master carpenter Sadatsugu Watanabe demonstrates his traditional skills



PHOTOGRAPHS BY MICHAEL HUNTLEY UNLESS OTHERWISE STATED

1 The first and basic 250-grit coarse stone **2** The *men-noashi-ki* flattening table and replacement abrasive sheet **3** The cheaper abrasive paper and plate glass stone flattening option. The *men-noashi-ki* is a lot easier to use and maintain than this homemade version **4** This is my homemade stone-holder, which I can fit two stones in. As the stones are different lengths I have made it to take the longer and use wedges to secure the shorter stone **5** Dry the surface of the stone and check it for flatness lengthwise, diagonally and across its width in various places

There are two types of Japanese waterstone – the ones you can afford and the ones you can't. The ones you can't are the natural stones called *tennen-toishi*. My contact in Japan, Masahiko Hosokawa, who studied at West Dean College, Chichester, when I was teaching there, says: 'In Japan we have *Miyadaiku* [carpenters] who work for *jinja bukkaku* [shrines and temples]. They have to use special professional tools to make it accurate and without mistakes. Some people pay over 1,000,000 yen (around £7,500) to buy natural toishi for their special blades. They take a few hours to sharpen a blade after work. I think still they love natural *toishi* for their job. But a normal woodworker uses manmade *toishi*.'

Apart from the price of the natural stones, how about the idea of spending a few hours after work sharpening tools? Any teacher, whether in the UK, Japan or elsewhere, would love to have students who care that much about their sharpening. In Japan they call it a spiritual discipline. Over here we just call it discipline, but I believe that acknowledging the need for a spiritual element to your activities adds a mysterious extra something to your work.

USING WATERSTONES

I shall assume that you have manmade waterstones in the Japanese style. I phrase it like that because some stones are made in America, some in Japan.

One of the great advantages of coarse Japanese stones is that they cut very quickly without producing much heat, so when thinking about a sharpening system it is essential to have a coarse stone which is safe and will not draw the temper of a blade. I advise my students to buy a 250-grit stone. The disadvantage of a 250-grit stone is that, although it cuts the steel of the blade very quickly, it also goes out of shape very quickly.

It is vital to have a method of flattening waterstones and checking for the stones' flatness. A dished stone will ruin your tools. Perhaps I am exaggerating a bit here, but it is better to drum it in – don't ever use a dished stone.

You can buy a little stone-flattening table, called a *men-noashi-ki*, which comes with water-resistant abrasive sheets. Alternatively, you can make your own table and use it with 80-grit wet and dry paper.

In use, the stones can be held in a purpose-made holder, or you can do as I do and sit them on a small board. I like to ensure that there is nothing flexible under the stone, so I am slightly sceptical about rubber holders; equally I am tight with money and just haven't bought one when an offcut will do.

COARSE GRINDING

Check that the stone is flat in all axes. If it is not flat then dip it in a trough of water and rub on the abrasive paper, turning it through 180° every 10 strokes or so. When ready, dry it off and check again. Using a pencil to hatch the surface is a good idea.

Once the stone is flat you can use it for fast cutting of the back or the bevel. As usual do not rock the tool because you do not want the front edge to become rounded.

FINE GRINDING

Once the coarse grinding is complete (which is easier to write about than actually do!), move on to a finer stone. Keep moving to a finer stone until a polish is achieved.

At each stage check that the stone you are using has removed all the scratch marks of the previous stone. One way of doing that when lapping the back is to end each session by moving the tool in a circular fashion. Use a magnifying glass to check for the circular grind marks then move on to the next stone.

Go through the normal procedure with that stone and then use the magnifier again. If you can still see any of the circular grind marks from the previous stone you must keep going with the present stone. Only when all the previous stone marks have gone can you change up to a new (finer) stone.

Remember to keep checking the stone for hollowing. Turning the stone around and using other places on the surface helps prolong the time between each flattening. After a while this turning, checking and flattening becomes second nature.

It is much easier when working on the bevel to see the effect of each grade of stone, but do still use a magnifier to examine the edge for condition. You can use your fingers to detect a wire edge which will tell you that the grind has reached the front of the bevel and it is time to turn the tool over and remove the wire edge.

This is when I start counting. If 20 strokes produce a wire edge on one side, only do 18 strokes on the other side to remove it, then do 15 strokes one side and 12 the other, then eight then five then three and you can probably stop. Sounds fussy, I know, but it works. If you keep doing the same number of strokes each side you will just be moving the wire edge from one side to the other. There are other techniques for removing the wire edge, but that is the one I use.

TWO SHARPENING SYSTEMS TO CONSIDER

Ideal budget system	**Ideal top-of-the-range system**
250-grit stone	250-grit stone
Sheet of dead flat glass	*Men-noashi-ki*
80-grit wet and dry paper	Additive for water
1,000-grit stone	1,000-grit stone
6,000-grit stone	4,000-grit stone
	8,000-grit stone
	10,000-grit stone
	Nagura stone

6a & **6b** When flattening the stone turn it through 180° every 10 strokes or so. That way you should even out any errors in the action or the surfaces **7** Hatching the stone with pencil strokes shows up hollows when the face of the stone is ground on the abrasive paper. The pencil marks are ground off the high spots but remain visible in the hollows **8** Lapping the back of a blade **9** Working on the bevel of a chisel. Because the chisel is thick, the bevel is wide and it is easier, but not essential, to work the bevel freehand

VISUAL INSPIRATION

EVERYONE HAS THEIR OWN WAY OF WORKING, BUT SETTING INTENTIONS AND MAKING INSPIRATION BOARDS CAN HELP YOU ACHIEVE YOUR GOALS

PHOTOGRAPH: LAINEN/SHUTTERSTOCK.COM

When I first started working on my own, I didn't really know how to organise my time. Some people thrive with a rigid structure and detailed plans, but I resent being told what to do and having a strict schedule felt too constrictive. I also tend to work in bursts and after a period of intense productivity I usually need some down time to recharge my batteries in readiness for a new project.

But these bursts of energy are not set in stone. They tend to change with my energy levels and mood, so it's quite hard to predict how much I'll be able to achieve on a set day, week or month. Every time I've tried making detailed plans, I've never managed to meet my schedule.

When I had too much flexibility, though, I tended to feel unfocused and wasted time on tasks that were not really a priority. After a lot of trial and error, I figured out that I work best when I make loose plans, set intentions and create inspiration boards.

By loose plans I mean a flexible schedule that features the most important deadlines and projects – my priorities. These signposts give me a structure within which to work but enough freedom to follow my energy levels and creative inspiration.

Deciding what constitutes a priority is not always straightforward, however, especially when unexpected opportunities and requests land in my inbox. When that happens, there's a risk of getting sidetracked and losing sight of my priorities. I realised that I needed to have more clarity on what I wanted to achieve, so I started setting intentions and making inspiration boards and collages to have a visual reminder of my goals.

SETTING INTENTIONS

Intentions are now the foundation, the driving force and motivator of my life. I set them on a regular basis for work and also for creative and personal projects.

When I'm clear about my intentions, I sum them up with a few keywords and then start cutting out images and words from magazines to create an inspiration board.

INSPIRATION BOARDS

I set intentions and make a board each time I start a big project. The inspiration board helps me stay on track and gives me the push to overcome challenges and doubts.

I choose the images that most inspire me and evoke the strongest emotional response. When I feel I have enough pictures, I start moving them around on the board to find the right placement. The process is engrossing and it can lead to further discoveries and insights on my intentions and goals.

Once the inspiration board is finished, I keep it somewhere where I can see it as often as possible – like pinned on the wall by my computer or on the first page of the notebook where I jot down my ideas.

The first inspiration board I created was all about my core values and desires and it's the one I keep by my desk. It means that every time I raise my eyes from the keyboard I can see why I do what I do.

IMAGES AND VISUALISATION

Inspiration boards are effective because the images trigger the emotional response necessary to feel inspired and motivated to take action and take you closer to your vision. Pictures bypass the mind and its negative thoughts of self-doubt and fear. They bring to life the emotions behind the goal.

Every time you look at your board, you are practising a short visualisation, a mental training technique that has been effectively used for decades in sports to improve performance.

Besides reminding you of your intentions, on a practical level, inspiration boards can also help you make decisions. For instance, when requests pop into my inbox, I ask myself: is this aligned with my intentions? Will it take me closer to my goal? When I'm not sure, a quick look at my inspiration board is usually enough to help me decide whether the project I'm asked to work on is in line with my goals or not.

This whole process of setting intentions gives me clarity and motivation, helps me avoid distractions and makes it easier to follow my own path.

HOW TO SET YOUR INTENTIONS AND MAKE A PERSONAL INSPIRATION BOARD

1 The first step is to find clarity on what you want to achieve. Ask yourself why, and explore the reasons behind your goals.

2 Choose a few keywords that sum up your intentions.

3 Set aside a couple of hours of uninterrupted time – brew some tea or coffee, turn your phone off, play some music.

4 Gather your source material – magazines, papers, photos, tickets, brochures – scissors, glue or double-sided tape, and some card or cork board to use as a base.

5 Start tearing out images and cutting out words from your collection of material. Choose photos that evoke your intentions and make you feel your goal – images that set the scene for your vision.

6 When you think you have enough material, start making your board. Move images and words around until the collage feels right and then glue or tape them into place.

7 Follow your intuition and be playful – you're making an inspiration board, not putting together a business plan.

8 I like to leave some blank spaces in my board, but if you prefer to fill all the space feel free to do it. The board is just for you, so don't be afraid of doing it wrong. The only important thing is that you found it inspiring.

9 Once you're happy with your inspiration board, keep it where you can see it often, as a reminder of your intentions.

WORDS: CRISTINA COLLI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A GRAND WORKBENCH JOURNEY – GREASE IS THE WORD!

KIERAN BINNIE MAKES A GREASE BOX FOR HIS 18TH-CENTURY STYLE WORKBENCH




PHOTOGRAPHS BY KIERAN BINNIE

OPPOSITE Testing the location of the grease box, using an auger bit as a temporary fixing **1** Boring the well with a Forstner bit in a hand brace **2** Paring the walls of the well **3** I start by paring the end grain, followed by the side walls **4** The completed well

For the hand tool woodworker, some form of lubrication is essential workshop equipment, as it is used to ease the path of saw plates, plane soles and screw threads. Mutton tallow is the traditional choice, and is what I have used for years, although paraffin wax also works very nicely. Regardless of which lubricant you choose, having somewhere to store it so that it is right at hand when working makes life at the bench a lot easier. I have recently finished building an 18th-century French style oak bench, following the description and Plate 11 engraving in André Roubo's *L'Art du Menuisier* (reprinted as *With all the Precision Possible* by Lost Art Press). Roubo explicitly refers to a grease box mounted on the underside of the bench, and includes an engraving of this detail in Plate 11, so I knew that I would end up making a grease box for the bench based on Roubo's description. Here is how I went about making this component of the bench.

LAYING OUT THE GREASE BOX

For the whole bench build I have abandoned modern units of measurement and used the 18th-century pouce as my base unit. This was the unit of measurement Roubo would have been familiar with, and the intention was to follow his description of the bench as closely as possible. In case you don't have access to any 18th-century French measuring devices (or the excellent modern Pied du Roi ruler made by American tool maker Brendan Gaffney), the pouce is equivalent to 1.066 imperial inches.

Beyond a brief reference in the text, and a small detail in Plate 11, Roubo does not say much about the grease box, and he does not give any dimensions. I let the material I had to hand dictate the overall size of my grease box. It was made from an offcut of the oak I had used for the workbench stretchers, and measured 5 pouce long by 3 pouce wide and 2 pouce deep. I laid out the recess which holds the grease so that the walls were ¼ pouce thick and the base was ½ pouce thick.

Roubo's engraving shows a rounded section approximately one third of the length of the grease box, which is bored to accept a fixing. He shows the solid end as having a rounded profile, and also being relieved underneath, presumably to reduce weight. I used a ½in diameter, 2in lag screw and washer from blacksmithbolt.com to mount the grease box, as this matched other hardware on the bench. The curved end was laid out with dividers to scribe a semi-circle, and I located the hole for the hardware at the centre of that arc, but equally you could use a different curve.

NEVER BORING WORK

Holding the grease box in place for boring holes is easier while it is a regular and solid shape, so now is the ideal time to hollow out the well and bore the mounting hole for the lag screw. Secure the workpiece with a holdfast or clamp so that it is upside down, and bore the hole for the lag screw, and a wider hole for the screw head and washer. I used a ½ auger bit in my 1920s era North Bros brace to bore the main hole, and a Forstner bit in the brace for the wider recess. Before boring out the well I held the grease box under my bench, with a ½ auger bit in the mounting hole, and pivoted it in both directions to test the layout of the well and decide on the final location of the box. Using the auger bit


5


6


7


8

as a temporary mounting pin allows you to test the pivot of the grease box without it wandering across the benchtop as you turn it. The location is a matter of choice, although it is important to avoid fouling holdfasts or bench dog holes when the grease box is rotated under the benchtop. It also makes sense to locate it near your usual planing position. Once I was happy with the placement of the box (just to the right of the front left-hand leg of my bench) I clamped it in place and drilled the pilot hole for the lag screw in the underside of my benchtop, using the grease box mounting hole as a guide.

Flip the workpiece over and bore out the waste using a wide Forstner bit. I used my brace, and counted the turns to ensure that the floor of the well was cleared to a consistent depth. Overlapping holes with the Forstner bit will reduce the amount of chisel work that's needed, so it is worth taking your time to bore out as much as possible.

Once you have hogged out most of the waste with the Forstner, use a wide chisel to pare the walls of the well clean, particularly the corners where the Forstner cannot reach. Once you are happy with the finish of the well, unclamp the workpiece and place it in the vice – it is time to shape the exterior!

SHAPING THE GREASE BOX

There are two stages to shaping the grease box – shaping the perimeter and then shaping the cutaway underneath the solid portion of the box (which the fixing runs through). I started by shaping the perimeter, but you could shape the cutaway first if you wished. To be honest, most of the work in making the grease box was shaping, and after many months of work building a rectilinear workbench, introducing some curves was a welcome change.

After gently rounding over the front corners (where the well is situated) with a 13-grain rasp, I shaped the arc at the rear of the grease box with a coarser 9-grain rasp. Work from each side of the grease box towards the apex of the curve, as this reduces the potential for the end grain to spelch. While there are several ways to approach shaping a piece with rasps, where the workpiece is wide (such as this) I prefer to work one side until the curve is fair and close to line, and then bring the rest of that face plumb to the established curve. This strategy divides the two key elements of shaping, and allows you to concentrate on achieving the desired shape without worrying whether the entire surface is coplanar, and then focus on achieving a plumb surface without worrying about the sweetness of the curve.

Work one side of the curve until it is close to the line, then swap to the other side of the workpiece and shape that. Once both sides of the curve are roughed in, bring them down to the final line before moving to a finer rasp (I used the 13-grain rasp to achieve my final shape, as this meant that only light sanding was needed).

5 Rounding over the front corners with a fine rasp
6 Shaping the rear section with a coarse rasp
7 Shaping just one edge allows you to shape a clean curve, then bring the rest of the surface down to plumb
8 Most of the waste for the cutaway can be pared with an in-cannel gouge
9 Rasping the cutaway smooth
10 The completed grease box after a coat of boiled linseed oil
11 The grease box mounted in place and rotated out for access

SHAPING THE CUTAWAY

Shaping the cutaway involves working across the full width of the grease box, and across end grain. First, sketch in the shape of the cutaway you want – this can be freehand as you will refine the final shape with rasps.

Given the amount of end grain to remove, instead of rasps I started by roughing in the shape with an in-cannel gouge. Unlike carving gouges which have the bevel on the outside of the blade, an in-cannel gouge has the bevel on the inside of the sweep. This means you can use the gouge with the bottom of the blade flat on the workpiece, as you would a chisel in the bevel-up position. I bevelled the far side of the workpiece with a coarse (9 grain) rasp to prevent spelching, and then pared the material away with the gouge until a rough curve was achieved. This was an efficient and swift way to remove the bulk of the material. I then removed the gouge marks and refined the curve with the 9-grain rasp before switching to the fine (13 grain) rasp to remove the tool marks, before lightly sanding the cutaway. Hand-stitched rasps such as those made by Auriou (which I use) are designed to be dedicated to right- or left-handed work, and take the cleanest cut when they are presented to the workpiece at a 45° skew. However, that is not to say that they do not cut well in other orientations, and for the cutaway I used the 9-grain rasp orientated straight across the workpiece so that the full width of the cutaway was worked consistently. This ensures a consistent curve after the gouge work, and I could then skew the smaller, and finer, 13-grain rasp to achieve a good surface finish. For more details on selecting rasps, and rasp techniques, see 'Ending the Tyranny of Straight and Square' in *F&C* 273, August 2018.

FINISHING UP

Once I was satisfied with the shape of the grease box I wiped it down with boiled linseed oil (the same finish as I had used on the rest of the bench). After the oil had dried it was then a case of mounting it to the benchtop with the lag screw and washer, and filling the well with lubricant. A kilo block of paraffin wax can be ordered from hobby stores (where it is normally sold for candle making) for very little cost, and will last a good few years. I broke off several chunks from the block and added them to the well of the grease box. Locating the grease box by the front left-hand leg of the bench is ideal for a right-hand dominant woodworker, as this places it close to the planing stop and right by where I spend the majority of my time when using planes or saws. Being able to pivot the grease box also means that it is readily to hand when needed, but also does not interfere with holdfasts or the operation of the bench when not in use. While this was a small detail of the workbench build, it has added a significant amount of functionality, and was a very simple (but satisfying) component to build. Regardless of whether your bench is a Roubo or a modern design, I would recommend adding a grease box.

KUMIKO, CURIOSITY AND CONTEMPORARY CRAFTSMANSHIP

OXFORDSHIRE-BASED **ANTHONY DAIN** HAS FOLLOWED HIS INTERESTS AND HIS LOVE OF LOCAL TIMBER TO CREATE A UNIQUE CONTEMPORARY DESIGN STYLE

Curiosity about furniture styles and how they were made drew Anthony Dain to set up his own business and create a unique style combining delicate Japanese kumiko techniques with smooth, clean lines in both traditional and unconventional pieces.

Anthony launched his own contemporary furniture workshop business in 2016 after spending more than a decade gaining experience in making, drawing and producing bespoke furniture and interiors for architects, interior designers and private clients.

He says: 'I was initially attracted to furniture making because you could have control and input at every stage of the process when making bespoke or small batch runs. I also just had a curiosity when looking at beautifully made furniture, about how exactly it was made. I wanted to learn how it was constructed and the skills used to cut the joints.

'I had considered studying product design when I was younger, but in the mass-produced you rarely get to work on every aspect of the product. I also liked the hands-on approach: many design jobs these days take you away from the workshop completely and, although I wasn't averse to sitting at a computer, I wanted to do some hands-on making. Now I can't really imagine not having time in the workshop.'

Anthony studied furniture making at Buckinghamshire Chilterns University College, now Bucks New University, in the early 2000s. 'I only had very basic knowledge of woodwork, but it taught all the traditional techniques and skills while allowing us to experiment and pursue different skills like steam bending and laminating in our own projects,' he says. 'Alongside the woodwork there were classes in related disciplines like upholstery, spray finishing, metalwork and contextual studies that allowed you to look beyond the cabinetmaker's workshop. Sadly the woodworking courses are no longer running in Bucks.'

Anthony's curiosity about how different furniture styles are created has led him to take inspiration from many different furniture traditions. 'In the grand scheme of things, many of the styles that have influenced me aren't a million miles apart,' he says. 'When I design something it usually starts as many little sketches in a pocket notebook, then if necessary I'll do some larger sketches, then I will use CAD briefly to work out a few things before building full size mock-ups. This applies to the furniture I make speculatively, obviously if it is a commission then there will be a brief and some form of specification to work to so the design process has to be slightly more structured.'

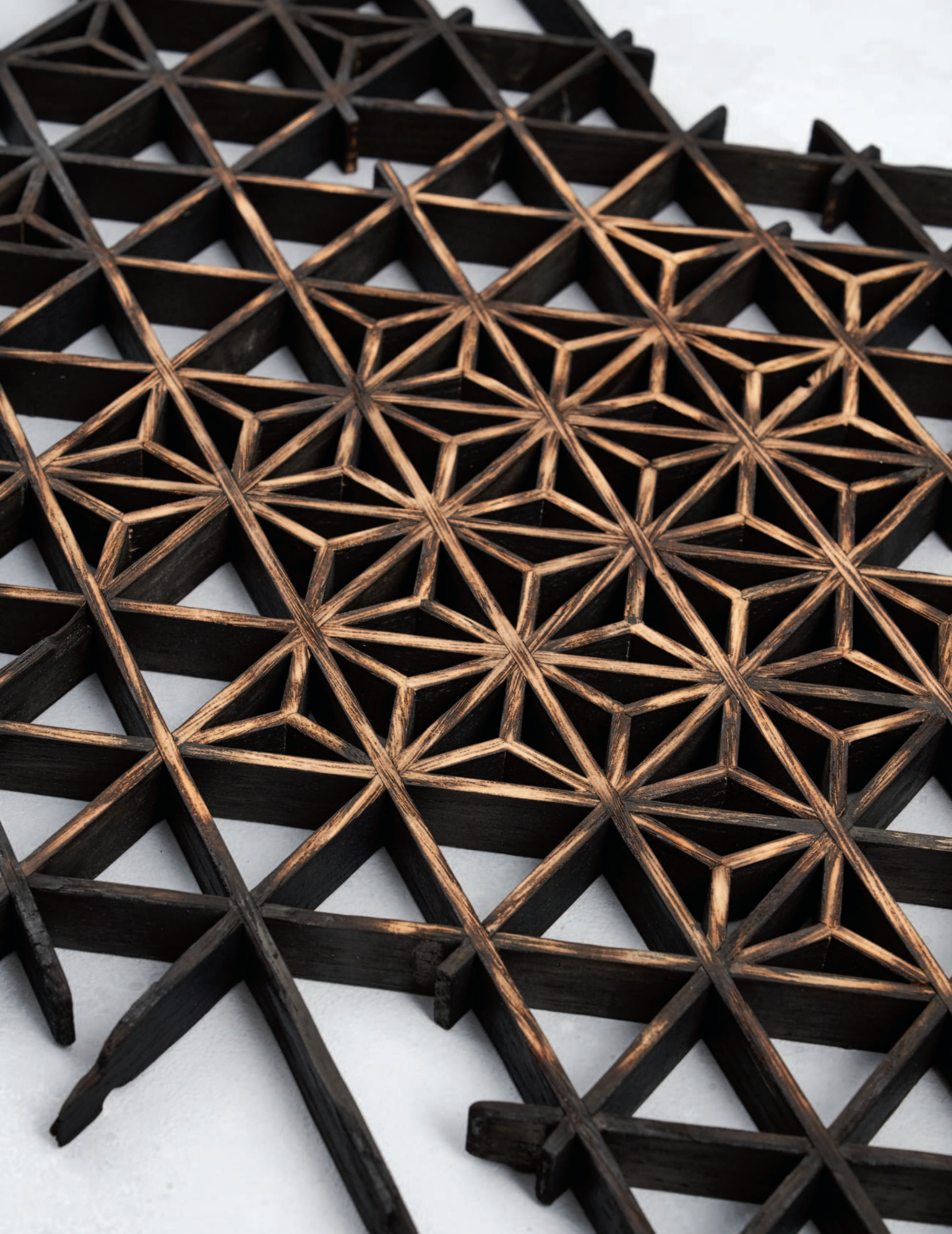
Anthony goes on: 'As with many of the paths I have followed in woodworking, I was initially attracted to kumiko out of a sense of inquisitiveness. I saw some photos of a large shoji screen with kumiko work in the middle and wondered how it was made. I realised the structure is inherently strong yet lightweight, and wanted to experiment with it.

'I learned by reading the excellent books by [shoji and kumiko woodworking expert] Desmond King and watching his videos. The work I do really only scratches the surface of what is possible in this craft.

'I knew I had to make the process fairly streamlined if I was going to keep the price of the finished pieces from spiralling out of control. I worked out ways to use jigs and machines for parts of the production, although there is still a huge amount of hand work involved. I've made life especially hard for myself by using hardwood – kumiko is traditionally made from softer timbers like Japanese cedar, so if something doesn't fit it can be "squashed" into position, but with oak you have to be pretty spot on, otherwise the pieces won't fit together or the whole panel can begin to twist as you add more pieces into it.'

Anthony prefers to use timber from local sources. 'I try where possible to use native timbers like oak and ash in my furniture,' he says. 'I'd rather the timber complimented the design, rather than being used as the main focus. That's why I often avoid using

PHOTOGRAPHY: YESHEN VENEMA



contrasting timbers or highly figured veneers. I think as makers today we have a responsibility to know where our materials come from and how they were sourced, and this is obviously easier if it comes from the UK. We also have to set an example to the next generation of makers. If we create a demand for local and British timber then hopefully the supply will increase in time.'

He himself has not had any problems with supply so far. 'We are lucky enough to have sawmills like Tyler Hardwoods, Vastern Timber and English Woodlands Timber here in the south,' he says. 'I am only a small maker buying relatively small amounts of timber at any one time, so it is not a problem for me. However, I have heard of medium-sized workshops struggling to find enough English oak at certain times, so I have no doubt there are supply issues for some.'

Social distancing measures have thrown up new challenges for Anthony, especially with shows and exhibitions being cancelled, as he finds sales work best when customers can physically interact with the pieces before they spend money – but social media has been helpful as a mini portfolio and 'business card' he can point potential buyers to. He adds: 'In terms of applying for exhibitions, awards or funding, social media will be the first place they look to get an idea of what you do and who you are.'

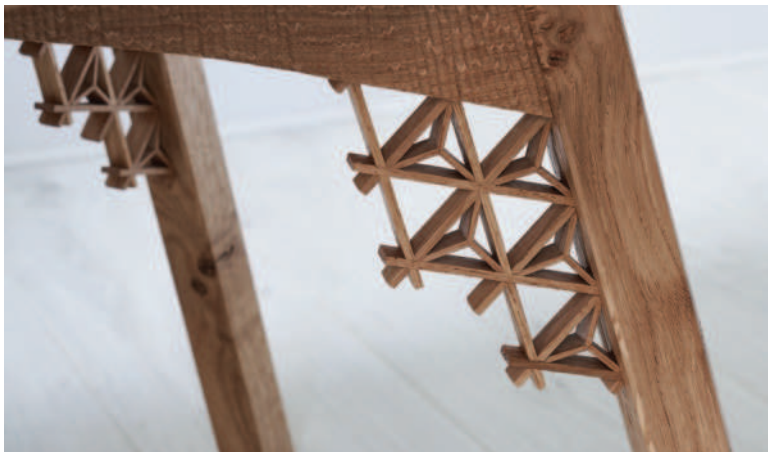
The launch of a series of stools he is working on – both chair and bar height – has been delayed because of the Coronavirus pandemic. 'They will see a release later in the year, so watch this space,' says Anthony. He adds: 'Towards the end of last year I worked with London-based ceramic artist Joseph Ludkin on a sideboard. He made three ceramic pieces which are integral to the design, while I made the rest of the sideboard from ebonised oak. Like the stools, that will be shown at London Craft Week when that comes around [originally scheduled for late April and early May, LCW is now due to take place in autumn].

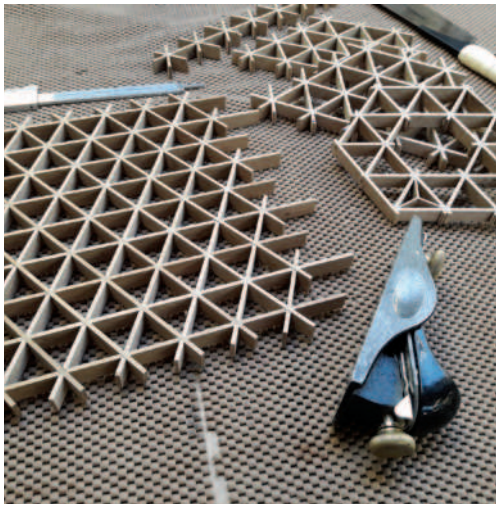
Anthony has also been busy moving from a communal workshop into his own space at the Sylva Wood Centre in Long Wittenham, south Oxfordshire. He says: 'For the past year I have been based in the communal workshops and it is a fantastic place to work. There are a diverse range of businesses on site from upholstery and furniture making to boat building and timber milling, and there is also the wood school which is rapidly expanding with a new large machine shop currently under construction. All in all it is a really interesting place to be based, and I'm excited to move into my own space.'

Looking at the impact the UK lockdown has had on the market, he says: 'I think it would be fair to say that before Covid-19 came along, handmade furniture and the broader craft sector in the UK was in really quite a good place. It is inevitable that almost every workshop across the country is going to be affected, at least in the short term.

'I hope that as we come out of this the smaller businesses are going to be able to adapt, be flexible and take opportunities as they arise. The world may be a different place once this is all over, but I'm sure there will still be a place for the makers. It may be that as the world has been forced to take a step back that reconnecting with craft and the handmade will be more important than ever.'

anthonydain.com





HENRY'S CHAIR

BRIAN HOLCOMBE DESCRIBES THE PRODUCTION PROCESS FOR THIS ALL-WOOD ARMCHAIR

PHOTOGRAPHS BY BRIAN HOLCOMBE

Simple enough in purpose, making a place to sit often presents a formidable task for woodworker and furniture designer alike. Three years ago, as I put together ideas for a sculpted armchair, I set up a few basic goals for what I wanted to accomplish: the chair would be composed entirely of wood including the seat, it would feature a light but sturdy structure and it would utilise traditional joinery. With each subsequent production of this chair I made improvements on how I accomplish those goals. I decided to go into business for myself when my son Henry was born, and this chair has become an important fixture in my progress, so I named it after him.

As each of these design goals are completed, they add complication to the process. Having a physically light structure as a goal requires one to make the most of each part of the chair, and that begins with understanding what devices make a structure strong.

A part connected at square corners to create a box is an inherently weak structure relying upon the corner joinery to keep it from loosening. To make it strong it must be built from heavy material. By contrast a splayed structure creates large triangles which make much stronger connections than square joints. Splayed angles turn racking loads into bending forces, so where previously we were trying to rock apart the joints, we're now trying to bend frame members which do not readily flex. This allows the use of lighter framing members.

Knowing the challenge this presented to me as a maker, I decided to splay the chair in one direction. The back legs would tilt at an angle and the chair would itself be tipped backwards. This created a sloping seat which is more comfortable to sit in and gave the chair strength in the direction it needed it most.

PROCESSING THE TIMBER

The work starts with breaking down rough sawn lumber into sections devoted to legs, arms, back, framing members and seat. Ideally these parts will all come from the same tree and will have been removed from the kiln at the same time. Over the course of a few days I bring the stock from rough form to square and true; this delayed processing helps to ensure the parts will remain true.

THE JOINERY

1 The main joinery consists of mortise and tenon joints at four locations and a mitred bridle joint at another. To aid in mortising I use a machine that I recently restored: the SM6 was manufactured years ago by MAKA and uses a swing chisel to cut a rectangular mortise. Unlike a hollow chisel which punches or a router bit which rotates, the swing chisel oscillates to cut. The oscillation creates a back and forth sweeping action in which chips are lifted from the mortise.

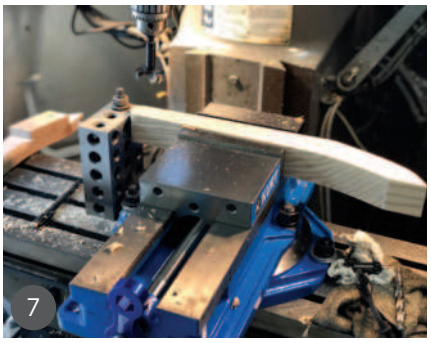
2 This mortising process is extremely fast and accurate, completing the mortise in approximately 10 seconds.

3 I produce the tenons on the router table. This completes the connection between the legs and the skirt assembly, the first of the major chair joints.

THE STRETCHERS

4 I can now move on to the stretchers that join the front to the back. In my design the back legs are tilted forwards at an angle, introducing splay. I designed an angle into the back legs to help resist the racking forces created when someone rocks a chair back (unintentionally) as they push away from a table. It's this force that loosens most chairs over the course of time. The skirt is mortised on the MAKA.

5 This now forms the basic chair structure with a set of legs connected to a chair skirt. The next step is to round the legs using a copy lathe and then the frame can be assembled. This particular set of chairs was made at counter height, so the additional length on these legs required a set of stretchers around the legs along with a footrest. The stretchers in addition to the skirt create another area where the joinery forms a long triangle, which adds integrity to the form.



THE SEATS

6 The seats are sculpted to form an impression for sitting and create a barrel-shaped underside. To mount a chair seat like this on to a skirt the seat must have housings cut into the bottom side which match to the skirt. The back of the skirt is tilted and so the back dado must also be tilted to match. I've taken to cutting this joint using a large 'mortising' bit on a milling machine. The seat blanks are then sent out to a shop which cuts them to match my handmade template using their CNC router. The original template was cut out using an adze and was finished with hand planes to provide the detail needed for them to produce copies using modern technology.

THE ARMS AND BACK

7 Next I move on to the arms and back. Using templates, I mark out the rough material, then move to the bandsaw to cut each piece. From there the parts are surfaced and then routed to match a template. I use a router table for this process and do so quite carefully.

8 Once this rough piece is formed I move to the milling machine to cut the joinery and shape the basics of the transition from leg to arm. Note: the guard has been removed for this photograph but should otherwise remain in place.

9 The milling does not create a finished part but rather a part featuring basic forms that I connect by hand. From that rough blank the arms are shaped using rasps, planes, spokeshaves and files to create a part much closer to that of the final shape.

10 The arms are then joined up to a rough-shaped backrest and glued into an assembly. The assembly is test fitted on the chair structure.

11 After the test fit, the backs are removed and shaped to something much closer to a final form. This is done at the bench where it is more comfortable to sculpt.

12 The finished back is then reinstalled permanently on to the chair. From there the completed assembly is carefully detailed using all of the aforementioned shaping tools along with a sander to make the complete and final version ready for the oil finish.

THE RIVER JOINT

When the team behind the Fenland Black Oak Project took on the monumental task of shaping a 5,000-year-old bog oak trunk into an enormous 'table for the nation', one of the biggest challenges was how to join the vast planks together while at the same time retaining their natural shapes.

Project director Hamish Low says: 'We placed the first two planks that came off the sawmill side by side and it was immediately clear not only how beautiful the planks themselves were when book-matched and sat side by side, but also how graceful and "river-like" the spaces were between them.

'Rivers feature heavily in the Fens and played a significant role in the preservation of these ancient oak forests, so we decided, there and then, that we must develop techniques for joining these planks together while at the same time retaining their natural shapes. This method of jointing we decided to call "the river joint" and this was to be the dominant factor when considering our plank selection.'

An in-depth description of how these unique joints were made can be found in the feature about this project on page 18.

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