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# The Woodworker

February 2015

www.getwoodworking.com

& Woodturner

## *Behind closed doors*

*Oak cutlery cabinet*



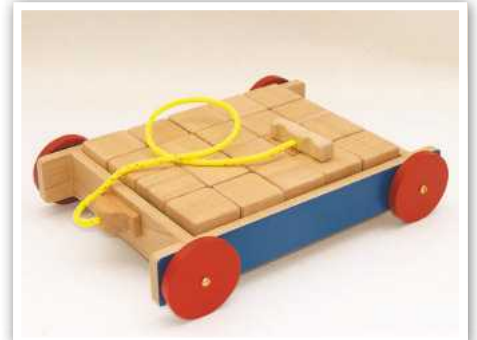
- Coat rack ■
- Barn door 2 ■
- Egg cup & bowl ■
- Child's cherry stool ■



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# welcome



New technology is great, isn't it? At least while it's all working as intended, that is. The minute it starts to play up it's a very different picture indeed... Now, the lucky ones amongst us will have a small child or a random surly teenager knocking about the place. If this is the case, then all is fine and your problems will soon be resolved. I love their fearlessness and seemingly natural intuition to fix almost anything.

## Helpless

For a lot of us though, and I count myself among this number, when things go wrong they really go wrong, and they rarely go right \*pause\* for me (as the song has it). If there's a way of avoiding the feeling of helplessness that comes with facing a blank screen or encountering the wrong type of connector plug, then we should all be taking it.

## Headache free

I think the almost complete lack of unsolvable problems posed by the average woodworker's kit and tools goes a long way to underlining its continuing popularity. A person in their own workshop is master or mistress of their own domain, and, as I'm sure you all know, that's a very good feeling indeed. There should be little in our woodworking environments which give us headaches. There's nearly always a straightforward solution, often as simple as tweaking an adjustment screw, fitting a new blade or just squirting some oil about the place.

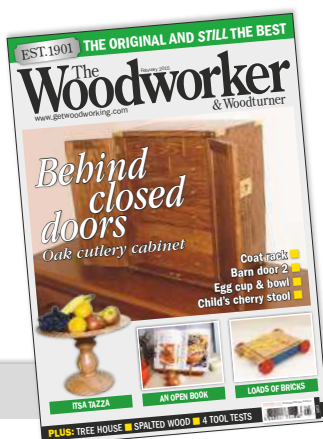
## New tricks, new dogs

Yesterday a couple of my college students were fixing up some old hand tools they'd acquired through various means. Despite their lack of basic practical knowledge – sadly the norm with many young people these days – they responded to suggestions with a heart-warming show of vigour and enthusiasm. It was an absolute pleasure to show them various tricks and techniques to repair and improve their kit, and a delight to see their responses when everything worked out as intended.

Repairing things is always a very satisfying achievement, whether out of necessity or just because you can. And if it's something that was heading for the skip – like most of my computer equipment – well, that's even better.

*Mark*

You can contact Mark on [mark.cass@mytimemedia.com](mailto:mark.cass@mytimemedia.com)



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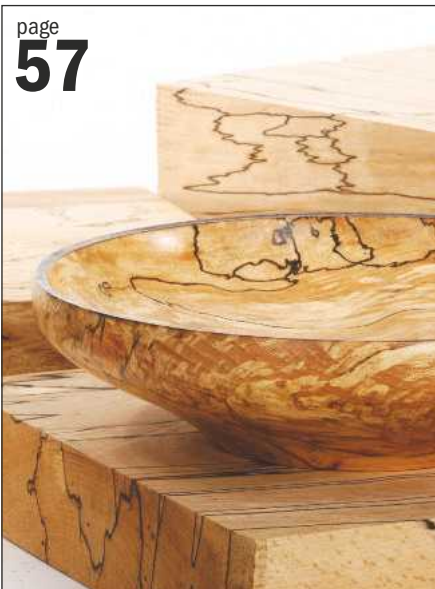
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& Woodturner

February 2015

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# In brief...

## Routing on video

Trend has just introduced three new cutter sets – the SS11 with six bits in two shank sizes, the SS24X with 24 cutters on 1/4in shanks, and the SS35X containing 35 cutters on 1/2in shanks. The company has also



produced a new video guide to bearing-guided cutters, explaining the different types and how to use them. To view it, or to watch Alan Holtham's new video review of the 2000W T10 and T11 heavy-duty routers, go to [www.trend-uk.com](http://www.trend-uk.com)

## Tool Show on the move

Building on the success of previous FFX shows at Bluewater, Tool Show 2015 is set to be twice the size with a move to the brand new Kent Event Centre in Maidstone. Set in approximately 50,000sq ft of first-rate indoor exhibition space, visitors will be able to enjoy live demonstrations from industry experts, see new product releases, and have a chance to enter exclusive competitions.

Over 100 companies will be exhibiting, including Festool, Bosch, DeWalt, Milwaukee and Stanley, and Makita will be celebrating their 100th anniversary. For full details, visit [www.ffx.co.uk](http://www.ffx.co.uk)



## High-class extraction

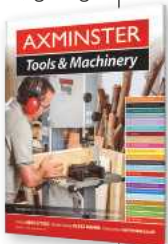
This 'L' Class XP380s extractor has been designed to remove the dust from hand-held power tools. The power head houses the highly efficient TwinFlo motor, and sound deadening keeps noise levels very low. The integral PCB provides power to the external socket and powers up the vacuum motor once you turn on your power tool. Auto shut-off after you turn it off then keeps the hoses clear. The kit includes a 3m hose, a stepped rubber adaptor, an alloy floor wand and a 300mm floor tool. It costs £419.95.

The Tritex filter system traps 99 per cent of dust down to 0.5 microns in size. HepaFlo bags are recommended for use to ensure safe waste disposal. A further upgrade to 'M' Class filtration can be made by fitting the optional HEPA filter module (£199.96). This simply clips into place between the power head and the container. The Tritex filters must be used as well. This will give the best possible filtration and satisfies the HSE's latest recommendations.

[www.axminster.co.uk](http://www.axminster.co.uk)

## New catalogue

Axminster Tools & Machinery's new 2015 catalogue – the 28th edition – offers the largest range of tools, machinery, accessories and consumables in the UK, and is the essential guide for all tool and machinery users. It contains 890 new lines, together with all the old favourites, giving a fantastic selection of over 10,000 products – indeed, everything you might need in the workshop, at home or on site.



New ranges include Rider planes, a complete reworking of cramps under the new brand name Axminster Trade Clamps, and the new trade-rated hex shank bits, to be known as Axminster Trade Bitz. Request your free copy by calling 0800 371822 or 03332 406406, or by visiting [www.axminster.co.uk](http://www.axminster.co.uk).

## Makita doubles up

Makita's Combo kits offer multiple tool packages sold as a single kit. The two latest kits also offer a variety of battery options from the Makita 18V lithium-ion range, including 3.0Ah, 4.0Ah and the latest long-running 5.0Ah batteries.

The DLX2040 two-tool kit (priced at around £420) features the new DHP481 combi drill and the DTD129 impact driver. The two-speed drill has a 20mm shorter body than its predecessor, making it even more compact for confined spaces.



The impact driver delivers up to 3,200 impacts per minute, so is ideal for heavy-duty site work.

The kit is delivered complete with DC18RC fast charger in a robust MacPac case. The RMJ version includes two 4.0Ah batteries, while the RTJ version comes with two 5.0Ah batteries for the longest possible run time.

The six-piece kit includes a jigsaw, rotary hammer drill, combi drill, circular saw, impact driver and torch, plus a fast charger and three 3.0Ah batteries. This complete workshop set is supplied in a rugged carry case and is priced at about £700, offering a substantial saving. [www.makita.co.uk](http://www.makita.co.uk)

## Show success

SK Promotions, the organisers of the recent 2014 North of England Woodworking & Power Tool Show at the Great Yorkshire Showground in Harrogate, report that smiles were much in evidence on everyone's faces as almost eight thousand visitors poured into the show. For many exhibitors it was their most successful show ever.

This year's show takes place on November 20 to 22 at the same venue. Further information is available from the show organisers. [www.skpromotions.co.uk](http://www.skpromotions.co.uk)

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# In brief...

## Getting a grip

Stanley's new Precision Screwdriver sets make light work of tricky applications, featuring a precision engineered clamp for maximum bit retention. Supplied in a handy reusable storage case, all the screwdrivers utilise new ergonomic soft grips, built for high levels of comfort and control. Ranging from 4 to 37 pieces, the Precision Screwdriver sets will be at home in a wide range of applications. Head types include Torx, Slot, Hex, Pozidriv, Phillips, Triwing and Resistorx, with sizes ranging from 1mm to 4mm, T5 to T20 and PH0 to PH000.

Stanley has also addressed the issue of rusty tools, with the introduction of the FatMax stainless steel screwdrivers. Boasting full stainless steel bars, these colour-coded screwdrivers with sand-blasted tips offer great corrosion resistance. [www.stanleytools.co.uk](http://www.stanleytools.co.uk)

## Liberon cleans up

Now is a good time to clean up your garden furniture ready for spring. Liberon Garden Furniture Cleaner prepares all types of wood and helps to prevent fungal re-growth. Just add two capfuls to a bucket of warm water and scrub it on; then allow it to dry for 24 hours.

The next step is to apply Liberon Garden Furniture Oil. It repels water and helps protect the timber from discoloration. [www.woodcareexpert.co.uk](http://www.woodcareexpert.co.uk)



## Hitachi packs a punch

Hitachi Power Tools has just launched the DV18DGL/JF, a new 18V combi drill that comes with a powerful 2.5Ah Li-ion battery. It weighs in at just 1.7kg with the battery attached, and delivers an impressive 55Nm of hard torque.

It also features a white LED work light, and there's a built-in drill bit holder for accessory storage. A single-sleeve chuck with a spindle lock function ensures that drill bits are held securely, and rotation speed can be controlled with a simple forward/reverse switch.

The battery has a clever slide design which makes it totally compatible with any of Hitachi's existing 18V cordless power tool range, and can be recharged in 75 minutes.

[www.hitachi-powertools.co.uk](http://www.hitachi-powertools.co.uk)

## North-east frontier

Axminster is expanding the retail side of its business once again. With representation already in the home counties, the midlands and the north-west, the tool retailer is now planning to open a store in the north-east at North Shields, about eight miles from the region's biggest city, Newcastle. The new store, the company's seventh, will be opening in the early part of 2015 and is situated at Coast Road Retail Park on Norham Road, NE29 7UJ.

With 10,000 square feet of retail space, the North Shields store will open seven days a week, including bank holidays,



in line with most other retail outlets in the area. It will stock 10,500 product lines including all of the most popular brands, and customers will be able to order in store anything that's in the Axminster catalogue.

## DIARY

### JANUARY

#### Axminster Skill Centre courses

**26-27** Beginners routing

**27** Penmaking \*

**29** Fine-tuning hand planes

**30** Sharpening tools

**31** Spindle moulding \*

\* Course held in Sittingbourne, Kent  
Unit 10 Weycroft Avenue, Axminster  
EX13 5PH

0800 975 1905

[www.axminsterskillcentre.co.uk](http://www.axminsterskillcentre.co.uk)

### FEBRUARY

#### Axminster Skill Centre courses

**2-6** Beginners woodturning

**5-6** Beginners routing \*

**9-13** Windsor chair making

**11-12** Beginners woodturning \*

**17** Turned boxes (intro)

**17-18** Bowls & platters \*

**19-20** Beehive making

**19-20** Beginners woodturning

**21** Sharpening with Tormek \*

**23** Pyrography

**23-24** Beginners routing

**24** Scrollsaw course \*

\* Course held in Sittingbourne, Kent  
Details as above

#### FFX Tool Show 2015

**27-1 March** Kent Event Centre,

Maidstone ME14 3HT

01303 852692

[www.ffx.co.uk](http://www.ffx.co.uk)

#### Record Power Road Show

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[www.yandles.co.uk](http://www.yandles.co.uk)

#### West Dean College courses

**13-15** Woodcarving for beginners

**13-15** Hinged case with Mark Cass

**20** Turning a wooden bowl

**20-22** Turning green wood

**27** Gilding furniture and frames

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BY ROGER BERWICK

# Behind closed doors

**I've always liked the look of military chests for their functionality and their simple but robust design. This project follows the theme to create a cutlery cabinet with a difference, but there's no reason why it couldn't be adapted to store anything else you wanted**

**T**his chest is a simply designed box carcass with a pair of fielded panelled doors which conceal nine drawers. The basic construction consists of a box 460mm wide, standing 610mm tall and 330mm deep, with 20mm thick sides and a 6mm thick plywood back. **Fig 1** gives all the relevant dimensions and joint details.

### A single width

The first job is to prepare your timber. My client wanted the chest constructed in European oak, and on rummaging through my wood store I found a wide board which I could use for the main carcass without having to join narrower boards together with biscuit joints. When I did the original design I'd hoped that I would be able to use a single width of board. Coincidentally, my thicknesser can machine timber to a maximum width of 330mm, so I felt I'd hit the road running!

### The right thickness

Having selected your board you need to thickness it. A 25mm sawn board will be ideal, allowing it to be thickened down to 20mm. I was very pleased with the board I planned to use, as some attractive figuring became apparent as it passed through the thicknesser, **photo 1**.

Next you need to surface the edges, either by hand or using your jointer, before crosscutting it to end up with two pieces 610mm long for the sides and two 460mm long, one for the top and the other for the bottom of the carcass.

### Joint selection

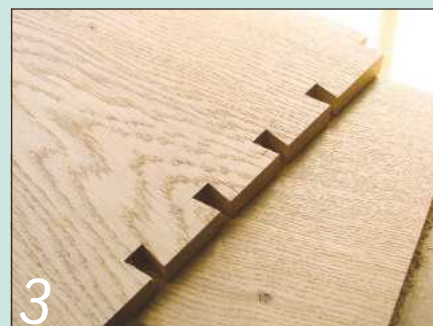
To maintain the simple but functional appearance of the chest, I would suggest that the corners of the carcass are dovetailed. You may prefer the look of half blind or lap dovetails, but I decided to save those for the drawers and went with



**1** Thickening the raw boards soon revealed some very attractive figuring in the oak



**2** I used a Leigh Jig to form the through dovetail joints I used on the carcass corners



**3** It took just a few minutes to square out all the dovetails with a sharp chisel

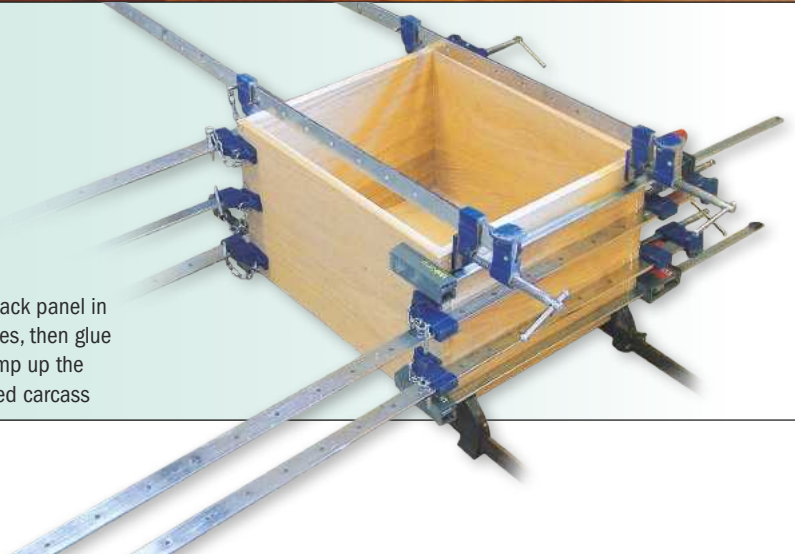


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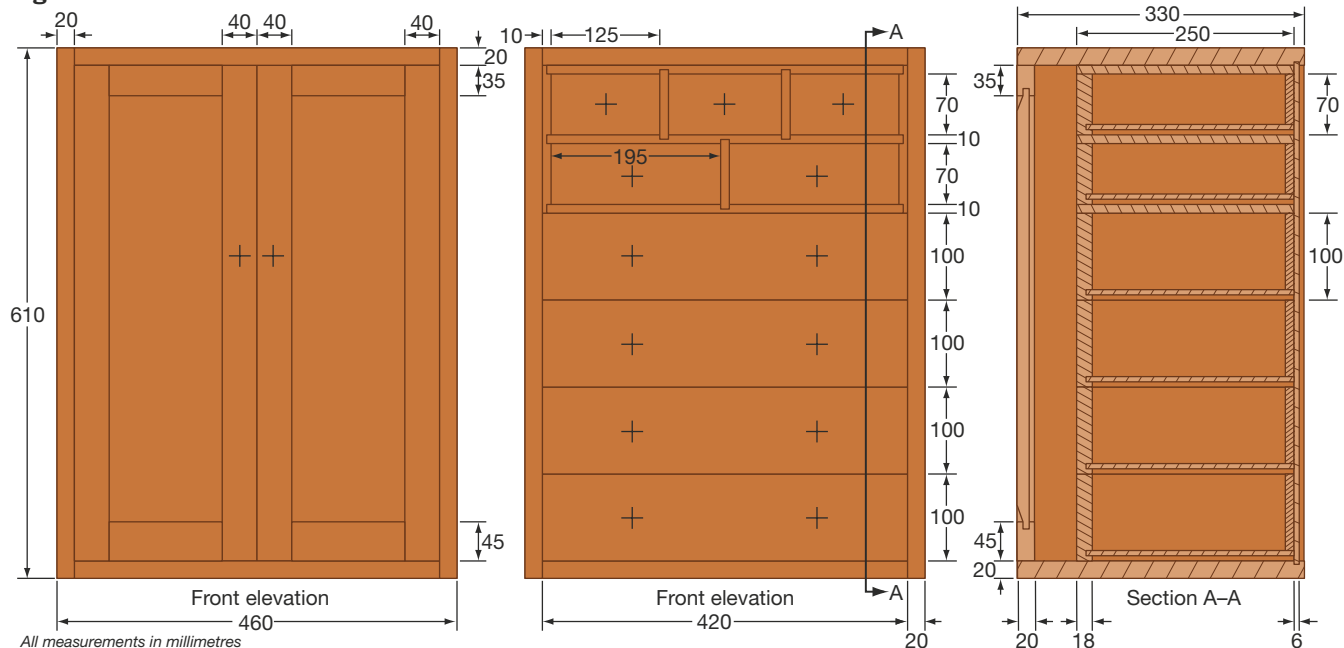
Rout a stopped groove in the four carcass panels to take the plywood back

5

Fit the back panel in its grooves, then glue and cramp up the dovetailed carcass



**Fig 1**



## CUTLERY CHEST CUTTING LIST

All dimensions are in millimetres

Part	Qty	L	W	T
Carcass				
<b>Top/bottom</b>	2	460	330	20
<b>Side</b>	2	610	330	20
<b>Back</b> (plywood)	1	582	432	6
LINING BOX				
<b>Top/bottom</b>	2	420	250	10
<b>Centre divider</b>	1	420	250	10
<b>Side</b>	2	170	250	10
<b>Vertical divider</b>	3	86	250	10
LARGE DRAWER				
<b>Front</b>	4	420	100	18
<b>Back</b>	4	420	88	9
<b>Side</b>	8	250	100	9
<b>Drawer slip</b>	8	230	19	5
MEDIUM DRAWER				
<b>Front</b>	2	195	70	18
<b>Back</b>	2	195	58	9
<b>Side</b>	4	250	70	9
SMALL DRAWER				
<b>Front</b>	3	125	70	18
<b>Back</b>	3	125	58	9
<b>Side</b>	6	250	70	9
DOORS				
<b>Top rail</b>	2	210	35	20
<b>Bottom rail</b>	2	210	45	20
<b>Stile</b>	4	570	40	20
<b>Panel</b>	2	502	142	16

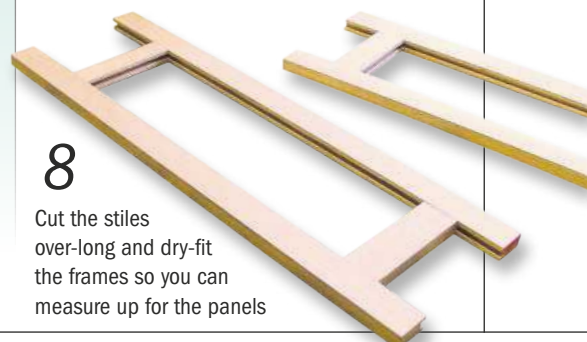
You will also need: 6mm plywood for the drawer bottoms, four 25mm solid drawn brass butt hinges, four 6mm insert ball bearing catches, fifteen 12mm diameter brass knobs, eight 50mm brass corner plates and two brass military chest handles.



6 The finished through dovetail joints on the carcass corners look neat and tidy



7 Recess the brass corners individually, and retain them temporarily with screws



8 Cut the stiles over-long and dry-fit the frames so you can measure up for the panels

straightforward through dovetails for the carcass corners.

Cutting the dovetails so the tails are on the carcass sides will give the best finished appearance. The layout of the dovetails is a matter of personal choice, but I decided to keep things simple and set up the fingers on my Leigh jig, **photo 2**, and to cut evenly spaced matching tails, **photo 3**.

I always feel that hand-cut dovetails are streets ahead of those cut using a router when they are executed properly, but there is a huge time difference between hand or machine-assisted cutting. What may take ten minutes on a Leigh jig could take you a couple of hours or more by hand, and when the customer is paying the bill I often find they pick the cheaper option.

### In the groove

With the dovetail joints cut on all four corners, the next step is to cut a groove along the inside of each rear edge to accept a plywood back panel. I chose to stop the grooves, **photo 4**, although the brass corners to be fitted later would have covered the holes had I run the grooves straight through.

The bottom of the carcass could be cut slightly narrower, allowing the back panel to be slid into the grooves after the dovetails were glued, but I chose to fit the panel at this stage when the carcass was glued up. This helps to keep the box square, effectively trapping the back panel within the carcass.

Cut the back panel to the correct size and give all the internal surfaces a good sanding before cramping up. You will need a number of sash cramps to get even pressure over the length of the joints, **photo 5**.

### Avoiding stains

Here's a point to remember when using sash cramps with oak. If the steel of the bar comes into contact with excess glue on the oak, you'll end up with unsightly black marks that will be difficult to remove. The simplest way to prevent this is to put a piece of paper between the cramp and the wood. I use Post-it notes, as the adhesive keeps them in place while you're cramping everything up.

Once the glue has fully cured, remove your cramps and clean up the outer faces of the carcass, I always like this stage of the job because you can see the fine line of dovetails you have cut, **photo 6**.

### Cutting corners

If you decide that you want to fit traditional brass corners as I did, it's a good idea to

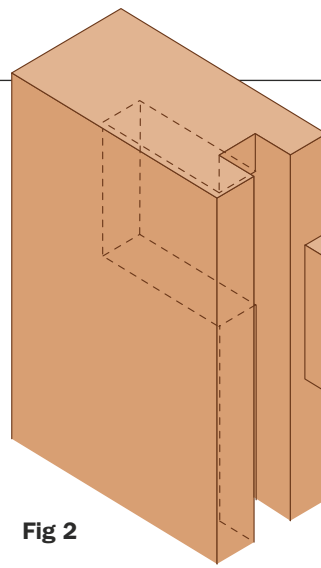


Fig 2

cut these into the corners next and effectively dry-fit them. Make sure that you treat each one as an individual entity, as they do vary slightly in size. With the corners temporarily fitted with a couple of screws, **photo 7**, you can proceed with the next phase of the construction.

### Door to door

With the carcass complete, it's time to make the doors. Start by machining the main components, cutting the side stiles over-length. Cut a 6 x 6mm groove along the inner edges of the stiles and the rails, ready to accept the door panel.

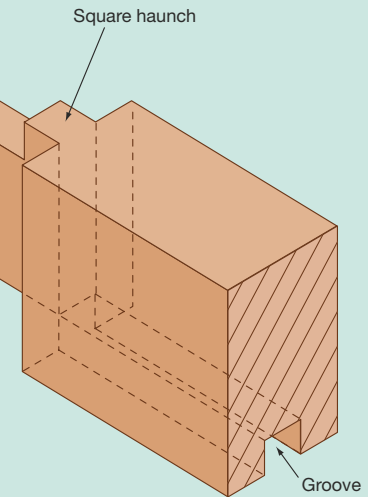
Join the corners of the door frames using mortise and tenon joints, remembering to leave a square haunch on the tenon to fill the remainder of the groove which extends past the rails – see **fig 2** above. Make the frames fractionally oversize to allow for accurate cutting-in once they're finished.

Dry-assemble the frames, **photo 8** and check the dimensions for the panels. Cut these from 25mm stock and thickness them. I took mine down to 16mm thick; I knew this would leave the back flush with the inner edge of the groove, while the raised panel would stand slightly proud of the frame.

### Panels and inlays

If you wish to field your panels, the easiest way is to use a suitable bearing-guided cutter on your router table, **photo 9**. You may need to clean up the angles with fine abrasive paper if there's any tear-out, **photo 10**. The panels could also be hand-planed if you don't have a suitable cutter. Panel-raising cutters tend to be expensive, and if you're unlikely to use them regularly they may not be a good investment.

I decided to apply an inlay line around the inner section of each door panel. With the panel tightly held on my bench top with my Zyliss clamp, **photo 11**, I routed a 4mm groove around each panel ready to accept the stringing. If you've never used a Zyliss clamp, I'd strongly recommend acquiring



Field the door panels using a bearing-guided panel-raising cutter in the router table



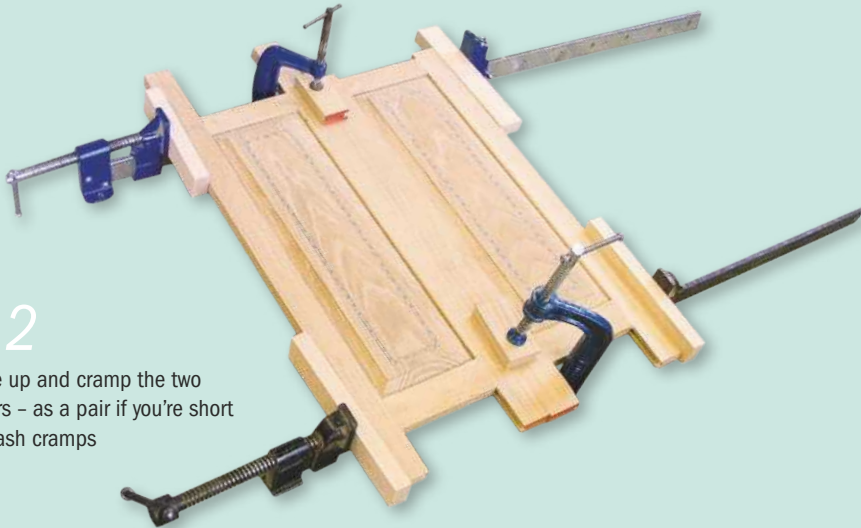
You may need to use abrasive paper to remove any tear-out occurring on the panel angles



I held each door panel in a Zyliss clamp while routing the grooves for the inlay banding

12

Glue up and cramp the two doors – as a pair if you're short of sash cramps



13

Trim and hang the doors, fit their catches and add the military-style handles



14

I used my Woodrat to cut all the dovetails on the 36 drawer components



15

Use a router to cut grooves 20mm wide and 6mm deep in the drawer sides



16

Make sure you reference the same edge of each drawer to ensure that the grooves are matched



one. I've had mine for years, and I always find that it comes to the rescue when no other cramp or holding device will work.

With your panels made, glue and cramp up the doors – as a pair if you're short of sash cramps, **photo 12**. Apply cramps to the meeting stiles to prevent the doors from springing up in the middle under pressure.

### Adding the brassware

Once the doors are dry you can cut back the stiles, trim them to fit within the carcass and hang them using 25mm solid drawn brass butt hinges. You could use the cheaper pressed brass-plated hinges, but these lose their electroplating over time.

The last stage of completing the carcass is to fit small ball catches, which can be drilled into the top and bottom edges of the doors. Then you can attach the two military-style recessed handles, one to either side of the carcass, **photo 13**.

### Different drawers

The internal drawers are fitted in two different ways. The four large lower drawers run on drawer slips, while the five smaller drawers at the top fit inside a lining box made from 10mm thick oak. The box into which the drawers slot is best made with half-lap and housing joints as shown in **fig 3**, and can be pinned after it's glued together for added strength. Make it a snug fit within the carcass, slide it into place and fix it to the carcass sides with a few short countersunk brass screws.

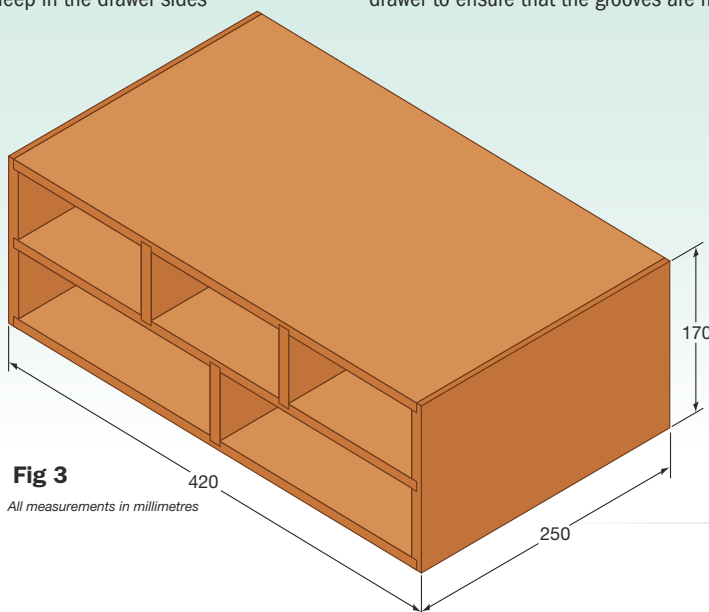
As I mentioned earlier, you can of course adapt the inside of the chest to suit your own personal requirements. I opted for the five smaller drawers in the top lining box with the four larger drawers below, but almost any permutation is possible.

### Little boxes

Now it's time to machine the timber for the drawer components, I thickened the stock for the drawer fronts to 18mm, while the sides and back were finished at 9mm.

Next, cut lapped dovetails between the drawer fronts and sides, and through dovetails where the back of the drawer meets the sides. Instead of revisiting the Leigh jig here, I used my Woodrat for the more repetitive dovetails on the drawers, **photo 14**. After all, I had 36 sets of joints to cut!

The smaller upper drawers sit within the pigeonholes in the lining box. The larger lower ones need to be a snug fit, but you should allow a couple of millimetres clearance at each side to cope with any slight discrepancy when fitting the drawer slips to the inside of the carcass.



**Fig 3**

All measurements in millimetres

### More grooves

Each larger drawer will require a groove cut along the length of each drawer side, stopped just short of the front, **photo 15**. I cut the grooves 20mm wide and 6mm deep; with the corresponding slip measuring 19 x 5mm there's then no chance of the drawer binding on the slip.

Cut the grooves using the appropriate cutter in your router. Make sure you always run the fence against the same edge of the drawer side to avoid any discrepancy in centring the groove. It doesn't matter if you reference the top or bottom of the drawer side, but make sure you do them all the same! **photo 16**

With all the grooves cut, you can now machine the corresponding drawer slips. Round their front ends on a disc sander so they fit neatly into the rounded ends left on the drawer grooves by the router cutter.

### Sliding home

The drawer slips are screwed to the inside of the carcass using countersunk brass screws. Take care to position them very precisely, and make sure you enlarge the screw holes slightly to allow for any movement which may occur in the carcass.

With the slips screwed in place you can now test-fit the four lower drawers on their slips, **photo 17**, and check that the five smaller drawers fit neatly into the pigeonholes in their lining box, **photo 18**.

Fitting the drawers in this way means that the drawer fronts will line up perfectly as their backs stop against the cabinet's back panel. Each drawer can be removed if you wish to take it away from the cabinet – to lay the table, for example, or to collect clean cutlery from the dishwasher.

### Finishing touches

You can now turn your attention to finishing the completed chest, **photo 19**. Separate all the components and remove all the handles and brass fittings before you start.

While I particularly like the natural appearance of freshly-finished oak, my client was looking for a slightly darker appearance. I therefore wiped over the oak with a couple of coats of Liberon Medium Oak spirit stain which brought out the grain, before finishing all the components with several coats of Danish Oil and a final waxing with Mylands Light Brown wax.

I finished the insides of the drawers with a lining of self-adhesive green baize and used some thin maple strips to form the dividers for the cutlery. Then I replaced all the brassware, wiped off my fingerprints and called my client to say the job was done!



17 Screw the drawer slips to the carcass sides and test the fit of the four large drawers



18 Check that the five smaller drawers fit neatly into their pigeonholes in the lining box



19

The chest is completed and ready for its spirit stain, Danish oil and wax finish





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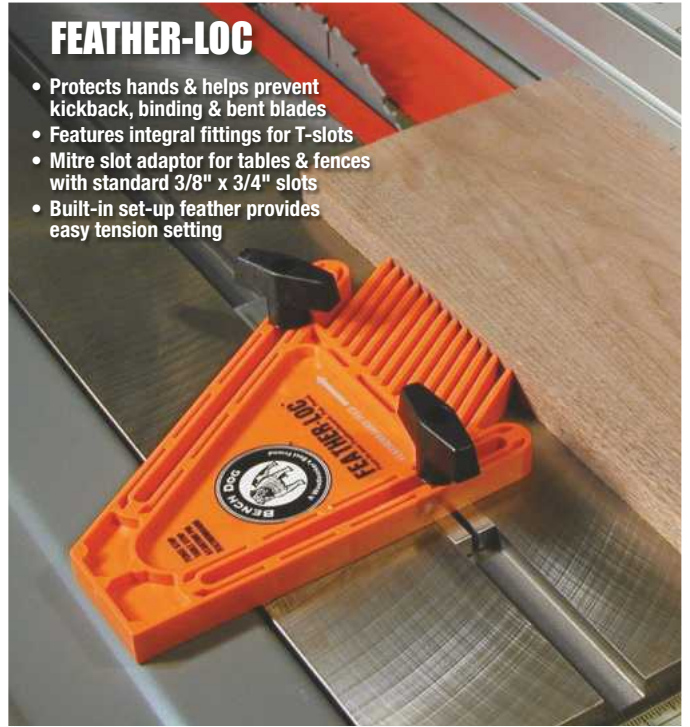
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BY KEITH SMITH

# Barn door 2

**Last month's article explained the battles we had to satisfy the local council's Conservation Officer, and described the beginning of the door's construction. Here's the concluding episode...**

**T**he first stage of this project gave me two identical frames for the door itself. From now on they would be treated completely differently, so I put one to one side and concentrated on the internal frame.

The first step was to cut a 6mm slot round the inside edge of the frame components to house the plywood panels. Once the ply had been cut to size the frame was glued together, **photo 1**. I then planed a small chamfer off the inside edge of the frame and cut out a hole in the central rail for the letterbox.

## Fitting the inner boards

Next I machined up the vertical boards and fitted them loosely in place, using spacers to ensure that there was a 2mm gap between them, **photo 2**. Once I was happy with the fit, I removed the boards and gave the edges a coat of Polyx oil, completely covering the tongues and grooves as this area would be difficult to finish properly once the door was assembled.

I then marked the centre point of each board on a slim batten to use as a guide rod. The boards were then clamped in



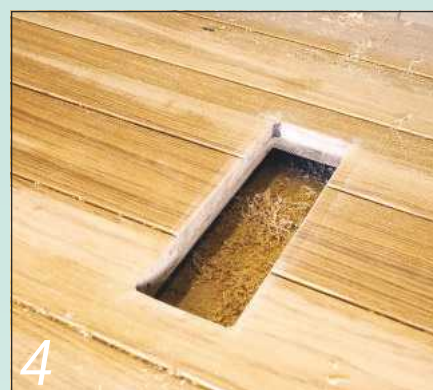
1 After cutting grooves for the plywood panels, I assembled the frame



2 The inner boards were cut and dry-fitted with 2mm spacers in between



3 I cramped the door on edge and screwed the boards in place from the back



4 The next step was to cut out the letterbox opening through the boards



5 It was now time to glue up the external frame using plenty of cramps



6 Cut the outer boards to length. The centre board is tongued on both edges

position and the door was tipped on its side so I could screw each board in place from the inside, **photo 3**, using the rod I had previously marked as a positional guide. I screwed down only one edge of each board to allow the wood to move in the future. All that remained was to cut the letterbox slot through the boards, **photo 4**.

### The external door frame

Now it was time to go back to the external frame. I started by gluing it all together, **photo 5**, and then cut the slot in the centre rail for the letterbox.

The next job was to loosely fit the vertical boards which I had previously machined to size when I made the inner frame. Note that the middle board has been tongued on both edges, **photo 6**, and so needs to be wider than the other boards by the depth of the tongue if they are all to be the same finished size.

The three middle boards now needed to be cut in two, and to have tongues and grooves cut in the ends, **photo 7**. Note that I've also cut some shallow stress-relieving grooves on their back faces. The two outer boards run the full length of the door; the

three middle boards are cut to overlap the centre rail, **photo 8**. This is then tongued and grooved on all four edges and slid into place, **photo 9**.

### Finishing the frame

After fitting the bottom three boards loosely in place, **photo 10**, I marked the letterbox position on the outer middle rail, took the door apart again, chamfered the inside edge and cut out the letterbox opening.

With the frame in pieces, I gave all the edges – which will be difficult to finish after the door is assembled – a coat of Sikens



7 Then cut the middle boards in two and tongue and groove their ends



8 The outer boards run full length; the middle three overlap the centre rail



9 The outer section of the centre rail is tongued and grooved all round



10 Complete the dry assembly of all the boards and check their fit



11 Dismantle the door, stain all the edges and begin the final assembly



12 Fit and cramp the lower boards and screw them in place from the back

HLS Plus and allowed this to dry before reassembling the frame.

I started with the top panel and the centre rail, **photo 11**. The two parts of the middle rail were glued together; the other boards are left free to move. Note that the exposed middle rail only runs the width of three boards. Its purpose is to allow a waterproof joint around the letterbox. Without this, water would track down the grooves and run into the letterbox opening. The door is to have a particularly large letterbox which will completely cover the rail when it's fitted.

Finally, I fitted and clamped the lower

boards in place before screwing them down to their rails using stainless steel screws, **photo 12**. Then I checked that the letterbox fitted within the opening without binding, **photo 13**, and neatened up the cut edges

#### Draught seals and locks

To draught-seal the bottom edge of the door, I chose to fit a Norseal automatic threshold seal. This is mortised into the bottom of the door, but while the door is in two halves it's an easy job to rebate the bottom of both frames to house the seal, **photo 14**. I also routed out a recess in the

two stiles to house the mortise lock before sanding the internal faces of the two frames smooth, **photo 15**.

#### Adding insulation

Next, I fitted 20mm thick Celotex insulation into the recesses created in the frames. Note that I've covered all the cut edges of the Celotex with aluminium tape, **photo 16**, to ensure that the wood glue didn't get onto the foam core of the Celotex. Some plastics react badly when they touch, and although in theory polyurethane wood glue shouldn't react adversely with the Celotex foam, this



13

Test-fit the letterbox to check that it doesn't bind within its opening



14

The threshold seal fits in rebates cut along the bottom edge of each frame



15

Cut the lock recesses and sand the inner faces of the two frames



16

Tape the edges of the Celotex panels and fit them into their recesses



17

Apply a thin coat of polyurethane adhesive to both faces of the frames



18

Assemble the two frames on a flat bench and cramp them tightly

precaution ensures that I won't have a problem in the future.

I then test-fitted the two frames together before giving both inner faces a thin coat of polyurethane adhesive, **photo 17**. At last I was able to bring the two frames together, **photo 18**, working on my bench which I know is flat. It was vital to glue it up on a perfectly flat surface, as any discrepancy would otherwise be locked in for life.

### Fitting and finishing

Once the glue had cured I carefully cleaned the dried excess off, trimmed the door to its

final size, rebated it for hinges and temporarily fitted the door into the frame. This allowed me to finish the door, inside with Polyx oil and outside with Sikksens ebony woodstain, as required by the Conservation Officer.

All that was left was to fit the door and frame, attach the door furniture and lock, and add the seals to the door frame for the job to be finally finished.

### A job well done

The door has been fitted for a while now, and it has performed remarkably well in a

wide range of weather conditions. When the sun shines on the black exterior, the outside of the door can get blisteringly hot. On the inside, however, the door doesn't even get warm, which bodes well for its long-term thermal performance.

My only disappointment is that the door doesn't look as spectacular as I would have liked, especially after all this work; in fact no one even seems to notice that we have changed the door. However, from a conservation point of view that is exactly what was wanted, so I suppose it's a job well done!

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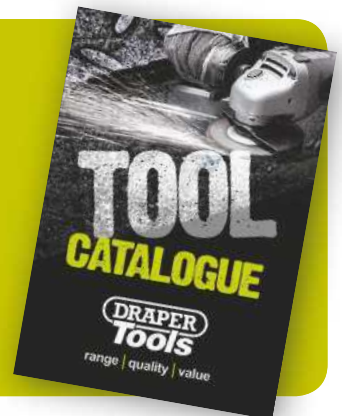


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\*Moulded base

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### Clarke 4" BELT/ 6" DISC SANDER

CS4-6D

• Dust extraction facility  
• 4" x 36" belt tilts & locks 0-90°  
• 225mm x 160mm table, tilts 0-90°  
• 370w, 230v motor

PRICE CUT NOW FROM  
£84.99 EX VAT  
**£101.99 INC VAT**

### Clarke 6" BELT/ 9" DISC SANDER

CS6-9C

• Includes stand  
• 1 Hp/ 230V/ 1ph motor

PRICE CUT NOW FROM  
£199.00 EX VAT  
**£238.80 INC VAT**

WAS £232.80 INC VAT

### Clarke 1" BELT & 5" DISC SANDER

CBS1-5

• Inc. 2 tilt/lock tables and mitre gauge  
• 300w motor

PRICE CUT NOW FROM  
£59.98 EX VAT  
**£71.98 INC VAT**

### Clarke JIGSAWS

CJS380

• DIY #Professional

PRICE CUT NOW FROM  
£12.99 EX VAT  
**£15.59 INC VAT**

WAS £17.59 INC VAT

MODEL	POWER (W)	DEPTH OF CUT (WOOD/STEEL)	EX VAT	INC VAT
Clarke CJS380	420w	55/6mm	£12.99	£15.59
Clarke CON750	750w	80/10mm	£24.99	£29.99
B & D KS600	450w	60/5mm	£29.98	£35.98
Bosch PST1700	500w	70/4mm	£49.98	£59.98

• Was £17.99 inc. VAT + was £35.98 inc. VAT  
• Was £40.79 inc. VAT

### Clarke ENGINEER'S DRILL PRESS

CBS2

• Tables tilt 0-45° left & right  
• Depth gauge  
• Chuck guards

PRICE CUT NOW FROM  
£59.98 EX VAT  
**£71.98 INC VAT**

WAS £77.98 INC VAT

MODEL	WATTS	EXC. VAT	INC. VAT
CDP5EB	350	£59.98	£71.98
CDP101B	245	£79.98	£95.98
CDP151B	300	£106.99	£128.99
CDP10B	370/12	£169.98	£203.98
CDP301B	510/12	£199.98	£239.98
CDP451F	510/12	£239.98	£287.98
CDP501F	980/12	£249.00	£314.80

• Was £77.99 inc. VAT  
B=Bench mounted  
F=Floor standing

### Clarke RANDOM ORBITAL SANDER

CROS1

• For sanding & polishing  
• 125mm diameter sanding discs  
• 4000-11000 opm

PRICE CUT NOW FROM  
£27.99 EX VAT  
**£33.99 INC VAT**

INC 5 DISCS

### Clarke BOLTLESS SHELVING BENCHES

Simple fast assembly in minutes using only a hammer

FROM ONLY £29.99 EX VAT  
**£35.99 INC VAT**

**SAVE 10%** WHEN YOU BUY ANY MIX OF 5 FROM THIS RANGE SAVE AT LEAST £17.99 INC. VAT

CHOICE OF 5 COLOURS  
RED, BLUE, BLACK, SILVER & GALVANISED STEEL

MODEL	SHELF DIMS WxDxH(mm)	EX VAT	INC VAT
150kg	800x300x1500	£29.98	£35.98
350kg	900x400x1800	£49.98	£59.98

ALSO EXTRA WIDE INDUSTRIAL UNITS AVAILABLE

**150kg** (evenly distributed) Strong 9mm fibreboard shelves  
**350kg** (evenly distributed) Strong 12mm fibreboard shelves

PER SHELF

### Clarke MULTI FUNCTION TOOL WITH ACCESSORY KIT

CMFT250

• Great for sawing, cutting, sanding, polishing, chiselling & much more  
• 250w motor  
• Variable speed

PRICE CUT NOW FROM  
£34.99 EX VAT  
**£41.99 INC VAT**

WAS £44.39 INC VAT

### Clarke ELECTRIC POWER FILE

CPF13

• Variable belt speed  
• Tilting head

PRICE CUT NOW FROM  
£44.99 EX VAT  
**£53.99 INC VAT**

WAS £59.98 INC VAT

\*Black & Decker

MODEL	MOTOR	EXC. VAT	INC. VAT
CPF13	400w/230v	£44.99	£53.99
KA900E	350w/230v	£52.99	£63.99

• Was £59.98 inc. VAT  
• Was £68.39 inc. VAT

### Clarke LIGHTWEIGHT ALUMINIUM QUICK RELEASE ALUMINIUM SASH CRAMPS

• From only £6.99 EX VAT  
• £8.99 INC VAT

MODEL	SIZE	EX. VAT	INC. VAT
CHT374	600mm	£6.99	£8.39
CHT375	900mm	£7.99	£9.59
CHT376	1200mm	£9.98	£11.98

### Clarke BELT SANDER

CONTRACTOR

• Two handles for increased control  
• 1200w motor  
• Belt size: 100x610mm  
• Belt speed 480M/min

PRICE CUT NOW FROM  
£69.98 EX VAT  
**£83.98 INC VAT**

### Clarke BELT SANDERS

BS1

FROM ONLY £29.99 EX VAT  
**£35.99 INC VAT**

MODEL	WATT	MM/MIN	EX VAT	INC VAT
Clarke BS1	900w	380	£29.98	£35.98
Makita 9911	650w	75-270	£94.99	£113.99

### Clarke RANDOM ORBITAL SANDERS

CROS2

INC 6 DISCS

• For fast removal of paint or for fine swirl free finishing  
• 6 x 150mm diameter sanding discs • 4000-7000 rpm

PRICE CUT NOW FROM  
£49.98 EX VAT  
**£59.98 INC VAT**

### Clarke BANDSAWS

PRICE CUT NOW FROM  
£109.98 EX VAT  
**£131.98 INC VAT**

WAS £143.98 INC VAT

HUGE RANGE IN CATALOGUE & ONLINE

CBS250 INCLUDES STAND

• Was £143.98 inc. VAT

MODEL	MOUNT	MOTOR	THROAT	EX VAT	INC VAT
CL CBS190	Bench	350w	190mm	£109.98	£131.98
CL CBS250	Floor	370w	245mm	£179.98	£215.98

### Clarke CONTRACTOR CR2 ROUTER

• Powerful heavy duty machine ideal for trade use  
• Variable speed control from 7,400-21,600 rpm  
• 2100w motor • 0-60mm plunge depth. CR3 Router with 15 Piece Bit Set also available only £94.99 £113.99

PRICE CUT NOW FROM  
£109.98 EX VAT  
**£131.98 INC VAT**

INCLUDES 15 PIECE SET WORTH OVER £20

### Clarke CORDLESS DRILL/DRIVERS

PSR18

PRICE CUT NOW FROM  
£34.99 EX VAT  
**£41.99 INC VAT**

WAS £44.39 INC VAT

HUGE CHOICE IN-STORE & ONLINE

MODEL	VOLTS	BATTS	EXC. VAT	INC. VAT
CCD180	18v	1	£34.99	£41.99
CCD240	24v	1	£39.98	£47.98
Bosch PSR18	18v	1	£49.98	£59.98

• Was £44.39 inc. VAT + was £56.39 inc. VAT  
• Was £71.98 inc. VAT

### Clarke DRILL BIT SHARPENER

CBS16

• Great for 3mm to 10mm HSS drill bits • 70W motor  
• Drill bit guide ensures sharpening at the correct angle  
• Saves cost of new drills

PRICE CUT NOW FROM  
£21.99 EX VAT  
**£26.39 INC VAT**

### Clarke PORTABLE THICKNESSER

CPT250

• Max thickness capacity 130mm  
• Planing depths adjustable from 0-2.5mm  
• Powerful 1250w motor  
• 8000rpm no-load speed

PRICE CUT NOW FROM  
£179.98 EX VAT  
**£215.98 INC VAT**

### Clarke POWER PLANERS

CON1020

• 82mm cutting width

FROM ONLY £24.99 EX VAT  
**£29.99 INC VAT**

MODEL	INPUT POWER	DEPTH OF CUT	EX VAT	INC VAT
Clarke CEP1	650w	2mm	£24.99	£29.99
Clarke CON1020	1020w	3mm	£36.99	£44.99
Bosch GH026-82	710w	2.6mm	£129.98	£158.98

\*110v + 230v in stock

### Clarke BOSCH ROUTERS

CR1C

FROM ONLY £39.98 EX VAT  
**£47.98 INC VAT**

ACCESSORIES IN STOCK

MODEL	MOTOR (W)	PLUNGE (mm)	EX VAT	INC VAT
CR1C*	1200	0-50	£39.98	£47.98
Bosch	1400	0-55	£74.99	£89.99

POF1400ACE

### Clarke CONTRACTOR 18V PRO CORDLESS DRILL/DRIVERS

• 10mm chuck size  
• 2 Speed, Variable control - 0-350/0-1250rpm  
• 21 torque settings

PRICE CUT NOW FROM  
£64.99 EX VAT  
**£77.99 INC VAT**

WAS £83.98 INC VAT

INCLUDES 12 PIECE BIT SET

2 Batteries

MODEL	BATTERIES	EXC. VAT	INC. VAT
CON18N	2 x Ni-Cd	£64.99	£77.99
CON18L	2 x Li-Ion	£84.99	£101.99

• Was £83.98 inc. VAT  
• Was £107.98 inc. VAT

### Clarke SHEET SANDERS

CON300

PRICE CUT NOW FROM  
£12.99 EX VAT  
**£15.59 INC VAT**

WAS £17.59 INC VAT

• Was £17.99 inc. VAT  
• Was £68.39 inc. VAT

MODEL	SHEET SIZE	MOTOR EX VAT	INC VAT
COS200	190x90mm	150w	£12.99 £15.59
CON300	230x115mm	330w	£29.98 £35.98
Makita	112x102mm	200w	£54.99 £65.99

### Clarke 1000MM VARIABLE SPEED WOOD LATHE

CWL1000V

SUPPLIED WITH ROBUST STEEL STAND

PRICE CUT NOW FROM  
£239.00 EX VAT  
**£286.80 INC VAT**

WAS £310.80 INC VAT

• Large 350mm turning capacity • Variable speed  
• Lockable tailstock • High quality cast iron build

MODEL	MOTOR	BLADE	EX VAT	INC VAT
CTS800B	600w	200mm	£69.98	£83.98
CTS11*	1500w	254mm	£139.98	£167.98
CTS10D	1500w	254mm	£149.98	£179.98

### EVOLUTION 255mm MULTI-PURPOSE TABLE SAWS

FURY 5 ONLY

PRICE CUT NOW FROM  
£159.98 EX VAT  
**£191.98 INC VAT**

WAS £215.98 INC VAT

MODEL	MAX DEPTH CUT	TABLE SIZE (mm)	EXC. VAT	INC. VAT
FURY5	54mm	73mm	£159.98	£191.98
RAGES	55mm	79mm	£88x656	£279.00

\*FURY power: 1500w (110v available)  
\*RAGE power: 1800w/230v (110v available)  
table extensions included  
• Was £215.98 inc. VAT + was £341.99 inc. VAT

### Clarke STATIC PHASE CONVERTERS

• Run big 3 phase woodworking machines from 1 phase supply  
• Variable output power to match HP of motor to be run

MODEL	MAX. MOTOR HP	FUSE	EX VAT	INC VAT
PC20	2Hp	10amps	£229.00	£274.80
PC40	3.5Hp	20amps	£269.00	£322.80
PC60	5.5Hp	32amps	£319.00	£382.80

ROTTARY PHASE CONVERTERS ALSO AVAILABLE

CONVERT 230V 1PH TO 400V 3PH

FROM ONLY £229.00 EX VAT  
**£274.80 INC VAT**

### Clarke 12" CONTRACTORS SAW

INDUCTION MOTOR

CCS12

• 1600w motor  
• 315mm blade  
• 90mm max cut depth at 90°  
• Dust extractor

PRICE CUT NOW FROM  
£239.00 EX VAT  
**£286.80 INC VAT**

### Clarke 13" MINI WOOD LATHE

CWL325V

• Ideal for enthusiasts/hobbyists with small workshops  
• 325mm distance between centres • 200mm max. turning capacity (dia) • 0.2Hp motor

PRICE CUT NOW FROM  
£129.98 EX VAT  
**£155.98 INC VAT**

### Clarke PLANERS & THICKENERS

CPT800

• Ideal for DIY & Hobby use • Dual purpose, for both finishing & sizing of timber (CP-6 planer only)

FROM ONLY £139.98 EX VAT  
**£167.98 INC VAT**

MODEL	MOTOR	MAX THICK. CAPACITY	EX VAT	INC VAT
CP-6	1100w		£139.98	£167.98
CPT600	1250w	120mm	£169.98	£203.98
CPT800	1250w	120mm	£189.98	£227.98

### Clarke WOODWORKING LATHES

3 PCE CHISEL SET INCLUDED WITH CWL1000

CWL1000

SEE CATALOGUE FOR ACCESSORIES

MODEL	CENTRE TO TURNING CENTRE (mm)	TURNING CAP.	TURNING SPEEDS	EX VAT	INC VAT
CWL1000	1016	350mm	4	£114.99	£137.99
CWL12D	940	305mm	5	£189.98	£227.98

FROM ONLY £114.99 EX VAT  
**£137.99 INC VAT**

### Clarke MORTISING MACHINE

**£144.99 EX VAT**  
**£173.99 INC VAT**

CBM1B

- Accurately creates deep square recesses • Table size 150 x 340mm
- Maximum chisel cap. 76mm • Robust cast iron base & column ensures stability & accuracy • 95mm depth of cut

*"It is fast and accurate with a good solid feel...Excellent value for money, I'm really pleased with it."*  
See [www.machinemart.co.uk](http://www.machinemart.co.uk)

CHISELS AVAILABLE FROM £7.99 EX VAT £9.59 INC VAT



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### Clarke WOODWORKING VICES

**FROM ONLY £13.49 EX VAT**  
**£16 INC VAT**

**Record WV7**

MODEL	MOUNTING	JAW (WIDTH/OPENING /DEPT)mm	EXC. VAT	INC. VAT
Clarke	Bolted	150/152/61	£13.49	£16.19
CHT152				
Stanley	Clamped	72/60/40	£16.99	£20.39
Multi Angle				
Record V75B	Clamped	75/50/32	£18.99	£22.79
Clarke WV7	Bolted	180/205/78	£24.99	£29.99



### Clarke 10" SLIDING MITRE SAW

- For fast, accurate cross, bevel & mitre cutting in most hard & soft woods
- 1800w motor
- Laser guide

**£129.99 EX VAT**  
**£155.99 INC VAT**

CMS10S2



### Clarke MITRE SAWS

**Evolution**

**Clarke** **RAGE3**

**FROM ONLY £54.99 EX VAT**  
**£65.99 INC VAT**

- Quality Range of Mitre saws and blades available
- MODEL BLADE DIA MAX CUT EX. INC. BORE (mm)DEPTH/CROSS VAT VAT

TH-MS	210/30	55/120mm	£54.99	£65.99
2112				
Fury 3	210/25.4	60/200mm	£119.98	£143.98
Evolution 255/25.4	75/300mm	£169.98	£203.98	
Rage 3				
Makita	260/30	95/130mm	£199.98	£239.98
LS1040				



### Clarke DUST EXTRACTOR/CHIP COLLECTORS


**PRICE CUT**  
**£119.98 EX VAT**  
**£143.99 INC VAT**

**METABO ALSO AVAILABLE**

- Powerful 750w motor
- 56 litre bag capacity
- Flow rate of 850M3/h

• was £155.98 inc. VAT

MODEL	MOTOR	FLOW RATE	BAG CAP.	EX VAT	INC VAT
CDE35B	750w	850 M3/h	56Ltrs	£119.98	£143.98
CDE7B	750w	850 M3/h	114Ltrs	£139.98	£167.98



### Clarke QUALITY CAST IRON STOVES

19 GREAT STYLES IN STOCK

FLUES, COWLS & ACCESSORIES IN STOCK

**BUCKINGHAM**

**£249.00 EX VAT**  
**£298 INC VAT**

6kW



### Clarke WHEATSTONE SHARPENER

- Produces accurate razor sharp cutting edges on chisels, scissors, tools etc.
- 120w motor
- Grinding disc 200mm
- Wet bath • Leather honing wheel

**£109.99 EX VAT**  
**£13 INC VAT**

CWS200



### Clarke MITRE SAW STAND

**CFMSS1**

**£64.99 EX VAT**  
**£77.99 INC VAT**

- Suitable for most sizes/makes of saw
- Inc. outriggers & rollers



### Clarke ROTARY TOOL KIT

**CRT40**

**£29.99 EX VAT**  
**£35.99 INC VAT**

- Height adjustable stand with clamp
- Rotary tool
- 1m flexible drive
- 40x accessories/consumables

Kit includes:



### Clarke DUST EXTRACTOR

CDE1000

- 50 litre tank capacity
- 183 m³/h flow rate
- 1000W input wattage

OTHER MODELS AVAILABLE

**£99.98 EX VAT**  
**£119.98 INC VAT**



### Clarke POT BELLY

**REGAL II**

**£349.00 EX VAT**  
**£418.00 INC VAT**

6.8kW

LARGE & XL MODELS IN STOCK

**POT BELLY**

**£94.98 EX VAT**  
**£113.98 INC VAT**

11.8kW

**BARREL**

**£209.00 EX VAT**  
**£250.00 INC VAT**

6.9kW



### airmaster TURBO AIR COMPRESSORS

- Superb range ideal for DIY, hobby & semi-professional use
- HUGE RANGE OF AIR TOOLS IN STOCK
- Grinding disc 200mm
- Wet bath • Leather honing wheel

**CLARKE 8MM AIR HOSE**

**FROM ONLY £5.99 EX VAT**  
**£7.19 INC VAT**

**MASSIVE PRICE CUT**

**£79.98 EX VAT**  
**£95 INC VAT**

8/250



### Clarke DISC SANDER (305MM)

- Powerful, bench mounted disc sander • 900W
- No load disc speed: 1490rpm • 305mm Disc Diameter (1 x 60 grid sanding disc included)
- Dimensions (LxWxH): 440x437x386mm
- Weight: 28kg

**PRICE CUT**  
**£119.98 EX VAT**  
**£143.99 INC VAT**

CDS300B



### Clarke 6" BENCH GRINDER WITH SANDING BELT

- For sanding/shaping wood, plastic & metal
- Supplied with coarse grinding wheel & sanding belt

**£49.98 EX VAT**  
**£59 INC VAT**

CBG6SB



### Clarke BENCH GRINDERS & STANDS

- Stands come complete with bolt mountings and anchor holes
- 6" & 8" AVAILABLE WITH LIGHT

STAND AVAILABLE FROM ONLY £41.99 EX VAT £50.39 INC. VAT

CBG8W features 8" whetstone & 6" drystone.

# With sanding belt

MODEL	DUTY	WHEEL DIA.	EX VAT	INC VAT
CBG6RP	DIY	150mm	£27.99	£33.59
CBG6RP	PRO	150mm	£37.99	£45.59
CBG6RH	HD	150mm	£47.99	£57.59
CBG6SB#	PRO	150mm	£49.98	£59.98
CBG6RWC	HD	150mm	£54.99	£65.99
CBG8W (wet)	HD	150/200mm	£55.99	£67.19



### Clarke HARDWOOD WORKBENCH

- Includes bench dogs and guide holes for variable work positioning
- 2 Heavy Duty Vices
- Large storage draw
- Sunken tool trough
- LxWxH 1520x620x855mm

**£129.98 EX VAT**  
**£155.98 INC VAT**

CHB1500

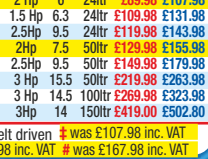


### Clarke TABLE SAW WITH EXTENSION TABLES (250mm)

- Ideal for cross cutting, ripping, angle and mitre cutting • Easy release / locking mechanism for table extensions
- 0-45° tilting blade

**£119.98 EX VAT**  
**£143.98 INC VAT**

CTS14



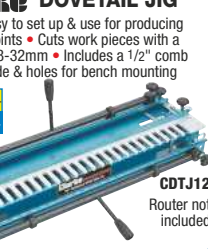
### Clarke DOVETAIL JIG

- Simple, easy to set up & use for producing a variety of joints
- Cuts work pieces with a thickness of 8-32mm • Includes a 1/2" comb template guide & holes for bench mounting

**£59.98 EX VAT**  
**£71 INC VAT**

CDTJ12

Router not included



### Clarke INDUSTRIAL ELECTRIC FAN HEATERS

- Rugged fan heaters for small to medium sized premises
- Tough steel cabinets
- Adjustable heat output with thermostat

**FROM ONLY £37.99 EX VAT**  
**£45.59 INC VAT**

DEVIL 6003



### VAC KING WET & DRY VACUUM CLEANERS

- A range of compact, high performance wet & dry vacuum cleaners for use around the home, workshop, garage etc.

**FROM ONLY £47.99 EX VAT**  
**£57 INC VAT**

MODEL	MOTOR	WEIGHT	D/RY	EX. VAT	INC. VAT
CVAC20P	1250W	16/12ltr		£47.99	£57.59
CVAC20SS*	1400W	16/12ltr		£59.98	£71.98
CVAC25SS*	1400W	19/17ltr		£64.99	£77.99
CVAC30SSR*	1400W	24/21ltr		£86.99	£104.39

\* SS = Stainless Steel



### Clarke RECIPROCATING SAW

- 850w motor
- 24mm stroke length
- Includes 3 wood & 3 metal blades

**CON850**

**PRICE CUT**  
**£49.98 EX VAT**  
**£59.98 INC VAT**

• was £85.99 inc. VAT



### Clarke SCROLL SAWS

**CS116V**

**FROM ONLY £64.99 EX VAT**  
**£77.99 INC VAT**

- 120w, 230v motor
- 50mm max cut thickness
- 400-1,700rpm variable speed
- Air-blower removes dust from cutting area

• was £101.99 inc. VAT

MODEL	MOTOR	RPM	EX VAT	INC VAT
CS5400B	85w	1450	£64.99	£77.99
CS116V ±	120w	400-1700	£79.98	£95.98
CS5400C*	90w	550-1600	£99.98	£119.98

\* Includes flexible drive kit for grinding/polishing/sanding




### Clarke ROUTER TABLE

**CRT-1**

**£56.99 EX VAT**  
**£68.99 INC VAT**

- Converts your router into a stationary router table
- Suitable for most routers (up to 155mm dia. Base plate)

Router not included



### Clarke Xtra

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<b>BOLTON</b> 1 Thynne St. BL3 6BD	01204 385799	<b>GLOUCESTER</b> 221A Barton St, GL1 4HY	01452 417 948	<b>PETERBOROUGH</b> 417 Lincoln Rd, Millfield	01753 311770
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BY DUNCAN ROSE

# Hanging together

**Every home needs somewhere for family and friends to hang their coats. This modern version of an old favourite features eight double hooks, all neatly recessed into an oak back board**

In winter the family tends to use more and more coats, and this wall-mounted rack provides space for plenty of them with a useful set of eight double hooks. It's sized to suit the wall space available; the dimensions and number of hooks are easily adjusted to meet your own requirements.

The rack I've designed features stainless steel hooks and an oak back board. Coat hooks are usually mounted directly onto the back board, but to add a bit of finesse here I recessed the hook bases into shallow sockets in the back board to give a flush surface. My hooks were made by Hafele (cat no 842.32.075).

## Checking the wall

When fully laden with coats the rack will be quite heavy, so I wanted a high-strength fixing to the wall. With this in mind I decided to start by looking at how the wall was constructed and checking for any hidden services within it.

Fortunately, this was a stud partition wall and I was able to locate the centre line of the studs using my hand-held cable and pipe detector, **photo 1**. The studs provide ready-made fixing points for attaching the rack using screws.



1 I used a hand-held detector to find the centre line of the wall studs



2 Rip the plank along its length on the bandsaw, leaving it slightly oversize

3 Plane and thickness the back board to the final dimensions you've chosen

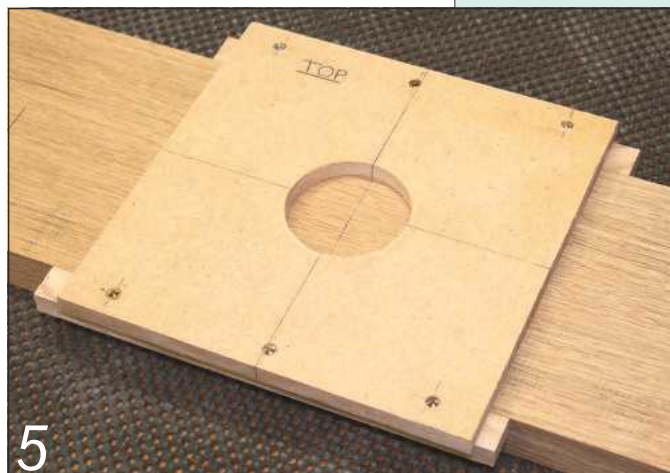


4 Mark out the hook positions at regular intervals along the back board



### Making the back board

Start by preparing the back board to the required dimensions. I used a plank of oak I already had in stock that needed some more machining. I crosscut the plank slightly over-long and then ripped it oversize along its length using my bandsaw, **photo 2**. Then I planed the plank flat, squared up an edge, thickened the work, **photo 3**, and crosscut it to the final length. Mine measured 1345 x 140 x 25mm.



5 I made up a simple router template to cut the hook recesses accurately



6 Cramp the template in place at each hook position and cut the recess



7 I used a small engineer's square to align the hooks on the back board



8 Use a hinge centring drill to locate the holes in the centre of the countersinks



9 Pre-cut the threads in the pilot holes using an ordinary steel wood screw



10 Chamfer all the edges of the back board and apply your chosen finish



11 Position each hook accurately in its socket and drive in the fixing screws



12 Counterbore the holes for the wall fixing screws and tap in matching oak plugs

Next, I marked the hook positions on the back board, **photo 4**, using a tape measure and square to set them at 170mm intervals. You can vary this if you wish.

### Cutting the hook sockets

The next task was to cut the eight sockets in the back board for the hook bases. Mine needed recesses 48mm in diameter and 4mm deep. I had intended to cut the sockets using a Forstner bit, but the closest size I had available was 54mm in diameter. Instead, I decided to cut them using a home-made router template based on a 54mm diameter hole. After fitting my hand-held router with a 14mm straight cutter and a 20mm guide bush, it would take only a few moments to cut the required 48mm diameter sockets.

### Routing the sockets

I made the template from an offcut of 9mm mdf, and began by drilling a 54mm diameter hole in its centre. Then I screwed on a pair of parallel guides, spaced 140mm apart, to locate the template across the back board, **photo 5**.

To use the template, align it to the hook position marks made earlier, clamp it to the back board and cut each socket in turn, **photo 6**. Make sure that you get clean cuts by using a sharp router bit; the flutes on the bit are easily sharpened using a diamond stone and some lapping fluid. The router plunge stop gives a precise depth of cut, ensuring that the hooks are a consistent flush fit with the back board.

### Fitting the hooks

It's now time to attach the hooks. The human eye is surprisingly sensitive to items not being perfectly vertical, so it's important to align the hooks carefully, **photo 7**; I used a small steel square for this. Then you can mark and drill the pilot holes for the stainless steel screws that are supplied with the hooks.

I used a hinge centring drill to locate the holes in the exact centre of the hook countersinks, **photo 8**, before drilling the holes a little deeper. It's worth numbering the position of each hook, as quite often the hole positions in hardware vary slightly,

especially if they come from different manufacturing batches.

Now screw the hooks in position and check they fit correctly. Oak is a particularly hard wood, so to prevent cam-out that could damage the appearance of the stainless steel screw heads, I first cut the threads in the pilot holes using ordinary steel wood screws, **photo 9**.

### The final stages

Remove the hooks and soften the appearance of the back board by cutting a small chamfer profile along the front edges. I cut these using my router fitted with a bearing-guided 45° chamfer bit, minimising the effects of any break-out by cutting the ends first and taking several passes.

Give the back board a final sanding and apply your finish. I brushed on three coats of hardwax oil, **photo 10**, rubbing the wet surfaces with wet-and-dry abrasive paper to give a perfectly smooth finish. Then all that remains is to reassemble the coat rack, **photo 11**, and hang it on the wall.

I used pairs of large stainless steel screws which I lined up with the wall studs, and counter-bored their holes so I could recess the screw heads. Then I fitted oak plugs with pva adhesive, tapping the plugs into place, **photo 12**, before trimming them flush using a sharp chisel and finishing them with hardwax oil to match.



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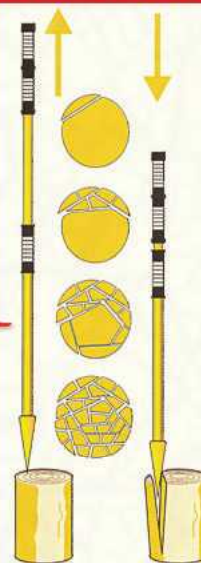
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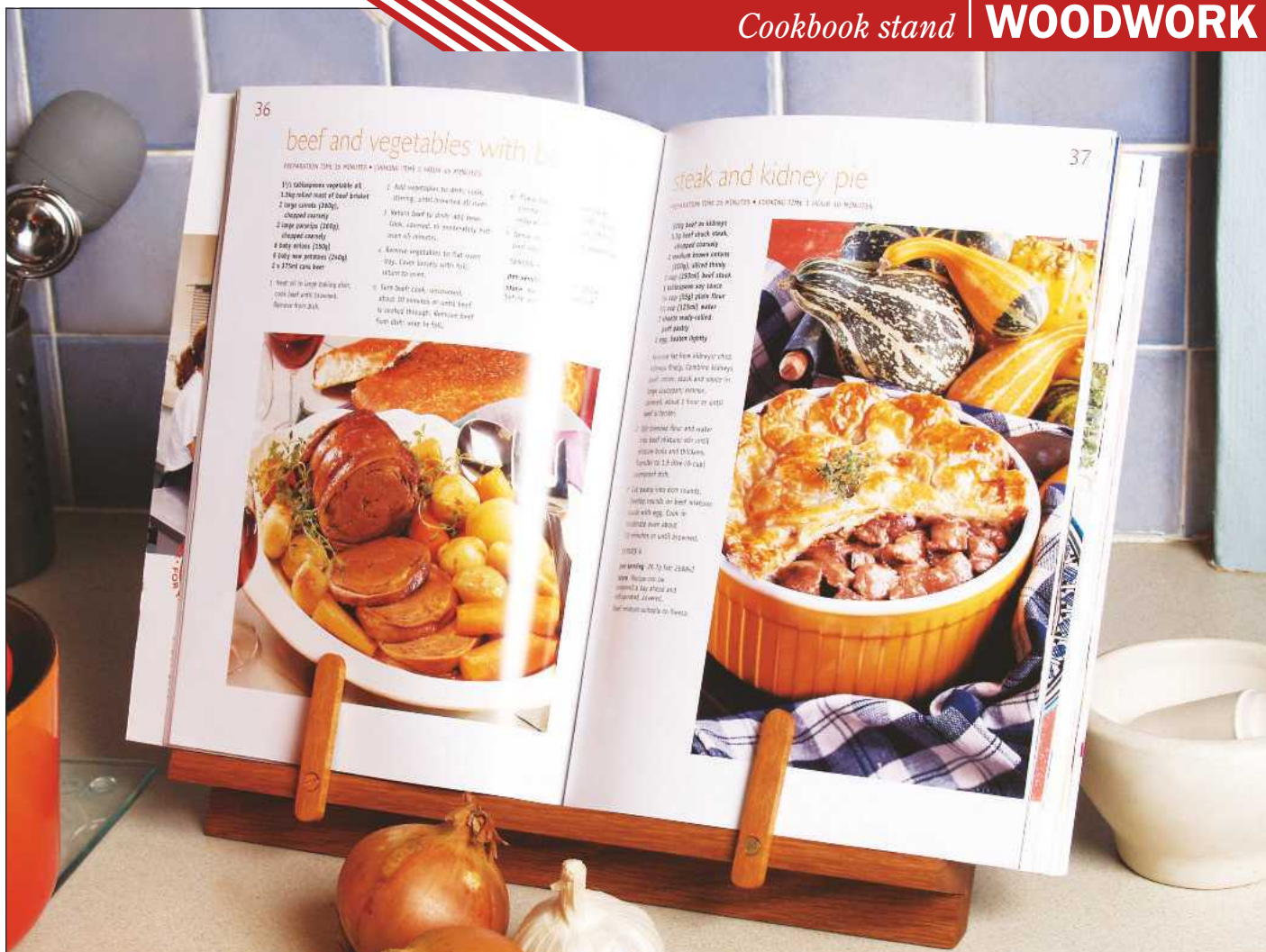


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BY IAN TAYLOR

# Stand to attention

**This handy kitchen bookstand holds even the largest cookbook conveniently to hand and open at the right place, yet it folds flat so you can store it out of the way when you've finished creating your culinary masterpiece**

I needed to edge-join two oak boards to get the desired width for the front panel. Cut the boards to length and square up the edges with a bench plane. You need to check carefully that the edges are square; otherwise your board may not end up flat. I then cut two biscuit slots in each mating edge, **photo 1**, to help keep the boards aligned during the gluing up, **photo 2**.

## Preparing the frame

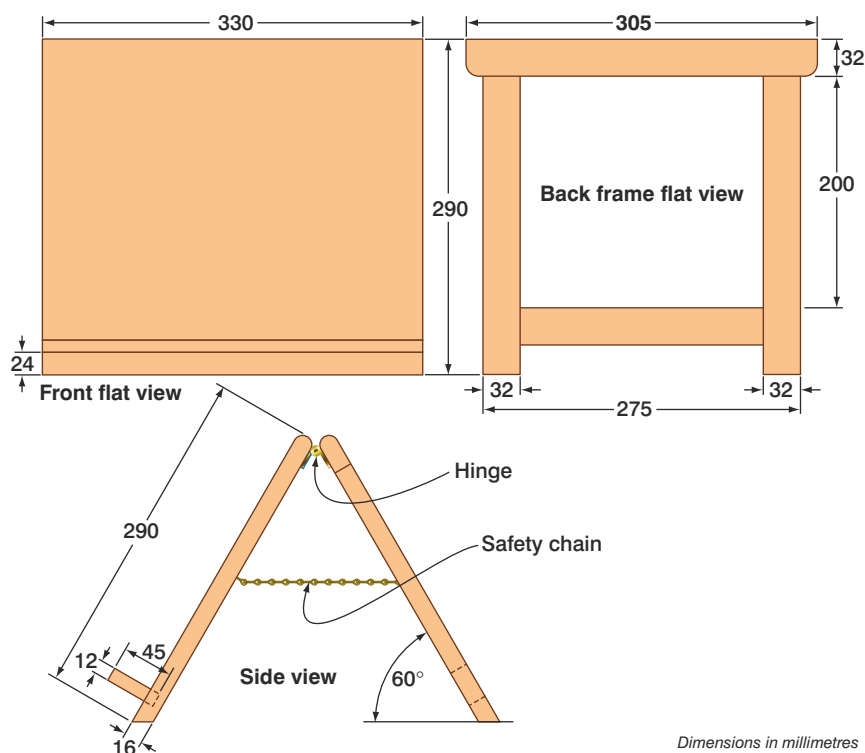
Dimension the timber and then mark up the mortise and tenon joints. The two legs are tenoned into the upper crosspiece, and the lower crosspiece is tenoned into the inside faces of the legs.

It's best to mark up the upper leg tenons as a pair. Scribe the shoulder positions across the face of both legs together, **photo 3**, and then square them round each piece separately. I used a sharp marking knife to give a clean shoulder line. The mortise positions should be marked with a pencil, **photo 4**, because a knife cut would show on the finished piece and they don't need the same sharp shoulder definition as the tenons.

## Cutting the mortises

There are several ways to cut the mortises, but I used a Forstner bit and my drill stand. Set up the fence position so that the point of the bit is directly over the centre line of

Fig 1



## COOKBOOK STAND CUTTING LIST

All dimensions are in millimetres

Part	Qty	L	W	T
Front panel	1	330	290	16
Support shelf	1	330	45	12
Rear leg	2	285	32	16
Upper crosspiece	1	305	32	16
Lower crosspiece	1	265	32	16

The rear legs and lower crosspiece include an allowance for the tenons.

You will also need: two 50mm brass hinges and brass countersunk screws, two small brass screw eyes and 150mm of fine brass chain.

the component, then tighten up the fence to lock it firmly in place.

Define the length of the mortise by drilling to the required depth against each end line, **photo 5**. You can then drill out the waste in between to give an almost perfect mortise slot. This gives you a mortise with rounded ends, which needs squaring up on with a sharp chisel, **photo 6**.

### Cutting the tenons

I cut the tenons on my bandsaw. This is only one of the several options for making tenons, but it works well for me; it's quick and accurate, and requires minimum setting out. First, define the shoulders by cutting back towards the scribed lines with a chisel, and remove the waste. This gives a clean guide channel for sawing down to the face of the tenon. Then cut the shoulders with a fine backsaw, **photo 7**.

Before you take your carefully-prepared components to the bandsaw, adjust the saw fence to give the right thickness of tenon. You need some scrap to set this up, but it has to be exactly the same thickness as the stock you're using. Cut down one side, flip the stock over with the other face against the fence and cut again. Remove the two cheeks and test the tenon thickness against the mortises you cut earlier. Adjust the fence position until the tenon is just the right width for a sliding fit in the mortise.

With the saw fence set accurately, you can cut the tenons very quickly, **photo 8**. You might need to clean up the corners



1 Cut slots for a couple of biscuits in each meeting edge to assist their alignment



2 Glue the two components together and cramp them securely while the glue sets



where the tenon meets the shoulder. The final step is to cut the tenons to width. Use the mortise as a guide and mark the cutting lines with a pencil, **photo 9**. Cut them with a fine backsaw, **photo 10**.

### Assembling the frame

The upper crosspiece is slightly wider than the leg spacing, so I put a small radius on the lower corners as a design feature. You need nothing more sophisticated than a 5p coin to act as a template. I rounded the rail to the marked profile using a rotary disc sander, **photo 11**.

It doesn't matter if you haven't got a sanding machine; you can get the same effect with a chisel and some abrasive paper, but the machine does it very quickly. You can then glue and cramp up the frame, **photo 12**. Check the diagonals to make sure that it comes together squarely.

### Finishing the back panel

With the frame made, you can resume work on the front panel. Trim it to length and width and clean up the edges with a plane and abrasive paper, **photo 13**. Sand the faces with a belt sander to remove any machining marks and glue squeezed out during cramping.

I wanted a round profile on the top of the front panel, and on the top rail of the stand. This could have been done neatly using the router, but for the small amount of moulding needed, it was quicker to simply plane it to shape, **photo 14**.



**3** Scribe the shoulder positions across both legs at once to ensure accuracy



**4** Mark the mortise positions with a sharp pencil; a knife cut will show on the finished piece



**5** Define the length of the mortise by drilling a hole to the required depth at each end



**6** Drill out the waste between the two holes to form the mortise, then square up the rounded ends with a chisel



**7** Cut the tenon shoulders down to the marked lines with a fine-toothed backsaw



**8** Set the fence position precisely on the bandsaw and cut the tenon cheeks



**9** Use the width of the mortise as a guide to mark the tenon width using a pencil



**10** Then cut the tenons carefully to the required width with your backsaw



**11** Use a 5p coin to mark a radius on the crosspiece corners and sand it to a smooth finish



**12** Glue and cramp up the frame components and check that the frame is perfectly square



**13**  
Trim the front panel to length and width and clean up the edges with a sharp plane



**14**  
Plane a rounded profile on the top edge of the front panel and sand it smooth



**15**  
Mark up the hinge positions on the leg frame first using a marking knife



**16**  
Mark the depth of the recess using a marking gauge, then trim away the waste wood



**17**  
Transfer the hinge positions from the leg frame to the front panel and cut out the recesses there



**18**  
Rout a 12mm wide channel across the front panel to receive the shelf



**19**  
Prepare the shelf, then glue it and screw it in place from the back and sand its ends flush



**20**  
Use a sliding bevel to set the 60° angle at which the frame will stand on the worktop



**21**  
Plane the required angle across the bottom edge of the front panel



**22**  
Use a fine-toothed backsaw to trim the frame legs to the same angle

## Assembling the stand

The two parts of the stand are hinged, which allows for easy storage when it's not in use. The barrel of the hinge is flush with the upper edges of the leg frame and panel.

Mark the hinge positions on the leg frame first, using a marking knife for a precise recess, **photo 15**, then mark the depth of the hinge recess with a marking or cutting gauge. You can use router jigs for cutting hinge recesses, but for a small job like this, the old-fashioned way works just fine. Chop a series of cuts across the recess with a chisel and mallet, then remove the waste, **photo 16**. Repeat as needed until you get to the right depth. Clean up the bottom of the recess so that the hinge sits firmly. When you've screwed the hinge in place, transfer the hinge positions from the stand to the front for an accurate match, **photo 17**. Repeat the same process to cut the recesses in the front panel.

## Fitting the shelf

The small shelf that supports the books is set into a 12mm channel, routed across the front of the panel to hold the shelf neatly, **photo 18**. I used screws from the back, with glue, to lock it firmly in place. I made the shelf very slightly wider than the front panel, and once the glue was dry I trimmed it back flush on the disc sander for a neat finish, **photo 19**. You could use a finely-set block plane and abrasive paper instead.

## Angling the base

The frame opens up at an angle of approximately 60°. I angled the base of the front panel and the feet so they will sit flush on the worktop when the stand is opened up. You could use geometry to calculate the precise angles needed, but it's quicker to use a sliding bevel to gauge the angle, **photo 20**. Then use the bevel setting to transfer the angle to the components. I planed the required angle across the bottom edge of the front panel, **photo 21**, and used a backsaw to trim the legs, **photo 22**.

## Adding the page holders

I used a different timber for the page holders. This gave a bit of a contrast with the oak, but it might have been better if I'd selected a darker wood. The page holders are screwed in position, using brass screws in neatly cut countersinks. They can be rotated out of the way when not needed.

You can finish the bookstand in any number of different ways. I made up my own wiping oil finish from equal portions of boiled linseed oil, polyurethane varnish and white spirit, which gave excellent results after several applications.

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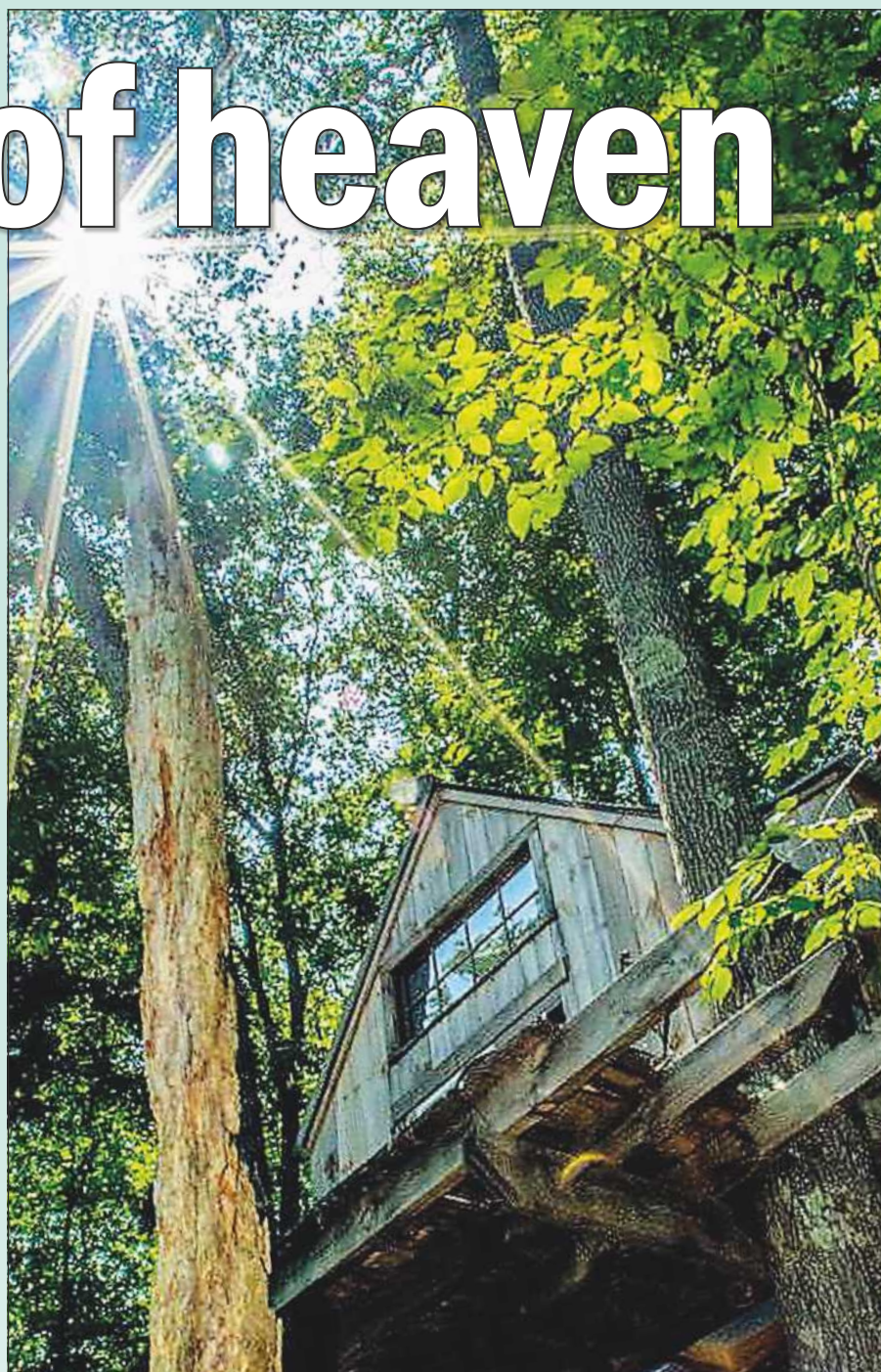
# Tree of heaven

**This is a heart-warming tale of how one young American couple took their housing needs into their own hands. It may be somewhat unorthodox but it's very practical... and utterly charming!**



Photos: Sarah Grote

**C**arpenter Dave Herrie always loved the open air. He had a desk job, but he hated it. Born in Westbrook, Connecticut, he took a break and hiked the length of the Appalachian Trail – a lengthy stroll of over 2000 miles through 14 states – and decided that country life was better than living in the city. Here's his story...



The Wee House began life as this unlikely looking kit of parts – mainly lengths of salvaged timber



Dave quickly learnt to form bare-faced tenons with a Skilsaw and a large chisel



Existing trees lent support to the base, which was designed to allow for their future growth



With the base completed, the house structure soon began to take shape



The main framework featured a mixture of old and new timber



The external walls were soon skinned with insulation and cladding



With the roof on and doors and windows in, the Wee House was almost complete

As the furniture arrived, the building soon began to look like home



The cosy sleeping loft has several windows that give all-round views of the surroundings

Kitchen facilities are basic but adequate... and pleasing to the eye



## Getting away

Dave was fortunate enough to own a house jointly with his brother, part rented to their friends. But he was in love and wanted to marry, and moving his beautiful fiancée, artist Kim Petersen, into the shared house would mean overcrowding. Since lovers naturally prefer seclusion, Dave made his big decision. He would build a modest hideaway on his own two-acre property.

## The right site

With Kim in full agreement, the couple chose a spot in the trees and drove to a nearby salvage yard to select the timber, coming away with some window sashes as a starting point for the rest of the house. Said Dave: "At this stage I had only a couple of years of woodworking experience, and was a bit daunted at the prospect of building my own house. But I also had a friend, Adam Pipkin, who agreed to lend his skills, and with his help we made a start."

## Perfectly formed

Last March, using just basic power tools and tons of enthusiasm, he created a rustic mini-house for two on a hillside, measuring barely 14 feet by 11 (Americans don't do metric). They called it The Wee House. To support the main carrier beams he made use of the surrounding trees, and, by projecting the house 12 feet off the ground on one side, he created a deck that was just perfect for sitting out on.

## All mod cons (almost)

Inside, there's a tiny kitchen, a cozy curl-up couch, and lots of bookshelves in every corner. A short ladder reaches the sleeping loft beneath a vaulted ceiling. Electricity comes from the main house nearby, and there's an eco-friendly composting toilet.

There's also space for Kim's easel, paints and brushes. Not surprisingly, she finds inspiration in the nature around her, and her landscapes adorn the walls throughout.

A sliding door gives access to the deck, where the lucky couple can sit with their dog Robbie and enjoy the forest scenery. Dave says: "We get to sleep in our cabin in the woods every night, and consider ourselves to be very lucky. We're very happy!" And the price of their happiness? The total outlay was under \$4000 (about £2500).

## Building for the future

With the valuable experience gleaned from the project, Dave has now started his own carpentry business, and is currently building more wee houses for other people with similar dreams.

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BY GORDON WARR

# Tuppence a seat

**What do you make for the youngest member of the family... something that isn't a toy, yet is personalised in some way? How about a small stool with a 'birthday' coin inlaid in the top?**

**T**his project is equally suitable for a boy or a girl. The coin selected dates from the year in which the youngster was born. The one I've just completed is inlaid with a two-pence piece; these coins have a slightly 'awkward' diameter (more of this later). Of course, you could push the boat out and use a gold sovereign instead!

#### Gaining the width

My little stool was made of cherry, and as the project is fairly small, it gave me the opportunity to use up some offcuts. This meant I had to joint up some pieces to give me the widths required. Because of this, I left a little extra on when I planed the offcuts to

thickness. This would allow me to reduce this to the required 16mm after the jointing up had been completed. To provide maximum strength for the stool, I used biscuits in the butt joints, **photo 1**. This stage was then followed by trimming the parts to length.

#### Marking out the joints

I planned to use lap dovetails at the top of the legs, and through mortises and tenons to connect the lower rail. The best way of marking out for dovetails is to indicate the extent of the joint with a cutting gauge, **photo 2**; a marking gauge will scratch rather than sever the wood fibres.

I usually adopt a slope of 1:7 for my



1

The joints between the sections were strengthened with biscuits



2

Use a cutting gauge to mark out the extent of the dovetails



3

I used a home-made dovetail template to mark out the joints



4

Clearly identify all the marked-out waste areas on the two legs



5

Use a Forstner bit to remove most of the waste from the dovetail sockets



6

A small chisel with an angled edge is ideal for trimming out the corners

## CHILD'S STOOL CUTTING LIST

All dimensions are in millimetres

Part	Qty	L	W	T
Leg	2	250	190	16
Seat support	1	190	150	16
Rail	1	200	50	20
Seat	1	350	200	16

Widths and thicknesses are net.  
An allowance has been added to the lengths.

dovetails, so the five sockets were marked out on the upper ends of the legs, **photo 3**. Clearly mark all the waste areas on the legs at this stage, **photo 4**. Start by sawing down the grain as far as this is possible; then remove most of the waste on the drill press. Use a Forstner bit for this, **photo 5**, setting the depth exactly to the joint gauge line.

### Trimming up

Sharp chisels are needed to remove the remainder of the waste, ensuring that the corners of the sockets are flat and square with only the sides being angled. I have a pair of 6mm chisels with their cutting edges





7 Use a coping saw to cut away most of the waste between the pins

8

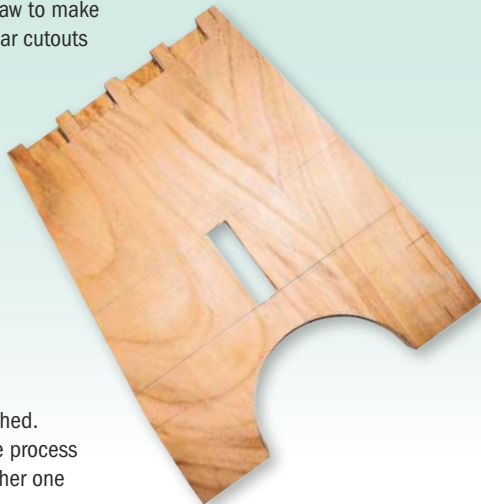
Tidy up the mortise by chiselling after boring out most of the waste



9 Use the bandsaw to make the semi-circular cutouts in the two legs



10 Sand the curve smooth; use a drum sander if you have one



11

One leg is finished. Now repeat the process to make the other one



12 Assemble the rail and legs, then drive wedges into the tenons

sharpened at an angle – one to the left, and one to the right. These enable me to cut into the acute angles, **photo 6**.

### Forming the pins

I always use a sharp hard pencil to mark out the pins directly from the sockets, and then square these lines across the end of this part.

The secret of forming a good dovetail lies in the next stage; sawing down the grain. This must be done so that the pencil lines just, and only just, remain at the edges of the pins. Then the bulk of the waste can be cut away with a coping saw, **photo 7**. This saw is not very accurate, so the sawing

must be done just above the gauge line. The final stage is to trim the remaining waste away by hand chiselling, working from both sides.

### Cutting the mortises

I couldn't form the mortises on the legs by using my bench mortiser, so the waste was first bored out, then tidied up with a chisel, **photo 8**. The ends were formed slightly on the slope so that when they were finally assembled the wedges used to lock the joint would fit perfectly.

I formed the small tenons by taking a series of passes over the blade of my saw

bench. Then cuts were made on the bandsaw down the length of the tenons, about 3mm from the edges; wedges would be driven into these cuts after assembly

### The final cuts

The slopes to the edges of the legs were marked, the waste was sawn off, and they were then trimmed down to the lines in double-quick time. Next, the semi-circles at the lower ends of the legs were marked and the waste cut away on the bandsaw, **photo 9**. I had a drum sander of just the right diameter to smooth these sawn edges, **photo 10**. I then repeated the whole



13

After assembly, level the lap dovetails off using a belt sander



14

Round the corners of the top slightly and soften all the arrises



15

Drill a shallow recess in the top for the coin and glue it in place



16

Give the completed sub-frame three coats of your chosen finish



17

Apply the same finish to the top, flattening down between coats



18

Attach the seat by driving screws up into it through the seat support

process to make the second leg, **photo 11**.

Cleaning up of the other surfaces was carried out largely by using a belt sander, with a little hand sanding to complete this stage.

### Assembly time

Even though this project is small, assembling was not that simple. First, the rail and one leg were glued up and the wedges inserted, **photo 12**. Then the second leg was fitted and wedged. At this stage the dovetailed seat support was added, but wasn't glued until I had managed to position a couple of cramps low down to ensure that the tenons on the

rail were fully home. Now the seat support could be glued in position, and the whole assembly left in cramps overnight.

Once dry, the outer surfaces were smoothed and well sanded, **photo 13**, and the top prepared for fitting to the assembly. It had its corners lightly rounded, **photo 14**, and all the arrises removed.

### Inserting the coin

My 2p coin was 26mm in diameter, but my nearest bit to that size was 1in or 25.4 mm, so I lightly filed the edges of the coin to give a good fit. How I kicked myself later when I discovered I did in fact have a 26mm flat

bit! So the hole was bored with the imperial bit, the coin was reduced a little in diameter, and it was secured for fitting to the assembly yet.

### Finishing touches

I used my favourite finish for the stool, **photo 16**, giving it three coats of pre-catalysed lacquer applied with a soft mop and flattened down between coats, **photo 17**. After lightly burnishing the lacquer with soft wax, all that remained was to screw the top in place from underneath, **photo 18**, and to hand it over to its new owner.

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Having spent over twenty years using carving tools to create Bonsai, Graham Potter the owner of Kaizen Bonsai then spent two years researching and developing his own tools after experiences with other tools which were just ok, reasonable or even dangerous!

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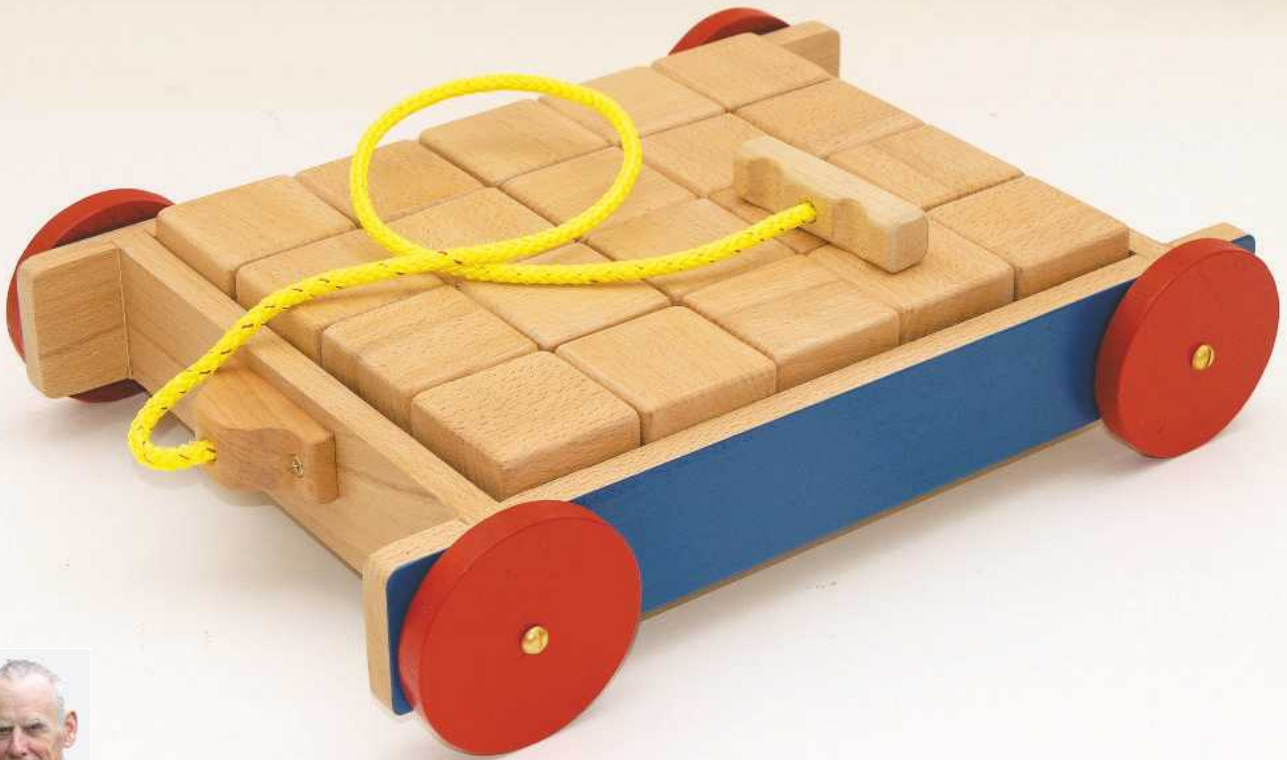


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BY IAN WILKIE

# Loads of bricks

**Ian Wilkie recreates a classic childhood favourite – the pull-along brick truck – in durable beech, guaranteed to last a generation or two**

**M**y own children had a truck full of plain beech bricks, and it proved to be popular and hard-wearing when they were between two and five years old. This type of toy never seems to go out of fashion, and it isn't difficult to make.

For this version the bricks are 50mm square, but if you think these are a bit too big for smaller children, you can simply reduce the size of the bricks and the truck accordingly. However, blocks of this size and density give the truck weight and stability so it can be pulled along smoothly.

The materials for this project cost no more than £20, and you can easily make it in a weekend.

## Making the bricks

Choose a fine-grained timber which is strong enough to withstand toddler play without bruising or splintering; beech is excellent. Prepare the piece of wood which will be sliced into bricks. This can be done with a handsaw and plane or by machine. Sand all four surfaces thoroughly and radius the edges.

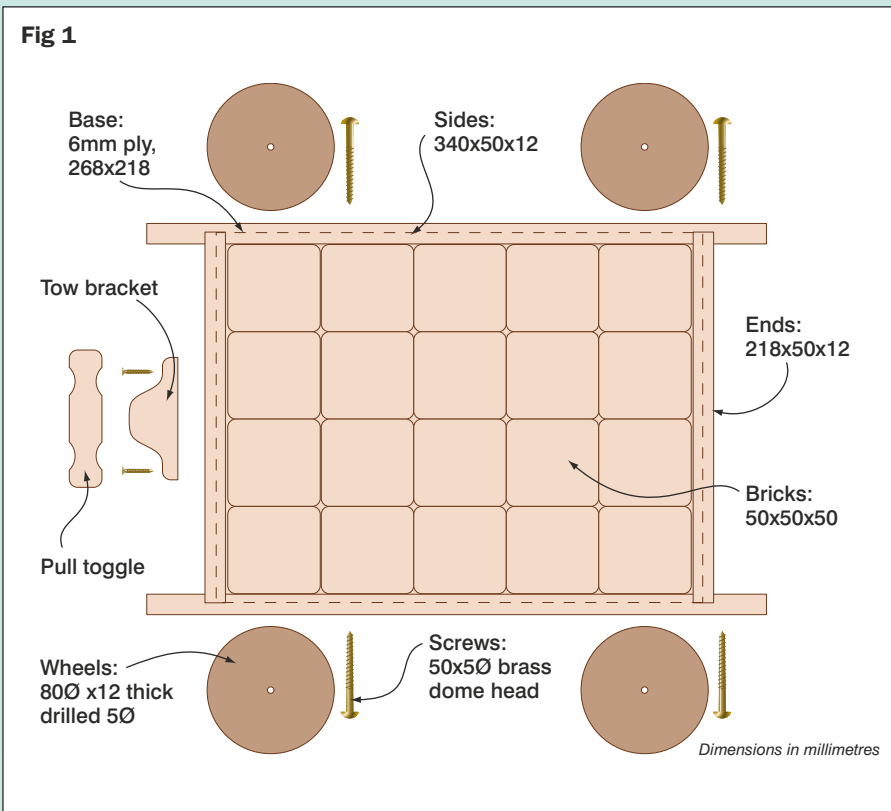
Cut twenty 50mm square blocks from the prepared wood. A mitre saw such as the Nobex is ideal for this, **photo 1**. Cramp a simple length stop to the table to ensure that all the blocks are cut to the same size.

Making repetitive cuts to produce small sections of wood using a bandsaw or table saw is inherently dangerous, and therefore I favour the hand mitre saw – it may take longer but it's much safer!

Sand the blocks once again so all the cut edges and corners are absolutely smooth and square, **photo 2**. The blocks are now ready for finishing, **photo 3**. If you have a disc sander, tilt the table to 45° and chamfer each edge, **photo 4**. Then round off the chamfers by hand or with a small drum sander, **photo 5**.

Producing the bricks is quite time-consuming. They need to be given at least two coats of clear varnish to protect the wood, allowing for the drying time between each application – check the directions on the tin. Alternatively you can paint them, decorate them with stencilled letters or numbers, or apply proprietary stickers and varnish over them.

**Fig 1**



## Making the truck body

The truck is basically a box on wheels which holds the 20 bricks. Butt them up in four rows of five and measure the overall dimensions of the arrangement. To allow the bricks to fit loosely, add an extra 3mm to each figure to get the internal measurements of the truck.

Prepare the wood for the sides and ends of the truck to a fine, sanded finish. Then fit a 12mm parallel flute cutter into your router and cut two 12 x 6 mm deep grooves across the sides, as shown in **fig 1** (left) and **photo 6**. I used an overhead router fitted in a Proxxon stand with a home-made table and guide. Because the router I use is a Trend T3, which isn't particularly powerful, I produced the required depth by making two passes.

Unplug the router and replace the cutter with a 6mm parallel flute cutter. Set up the table and cut a 6mm wide groove 6mm from the bottom edge of each piece, **photo 7**. Rout the end pieces to a depth of 6mm and the sides, between the two vertical grooves, to the same depth, as shown in **fig 2** opposite.

Assemble everything as a dry run. Then mark out the plywood base to the correct size and cut it out. It's well worth taking the trouble to sand both surfaces of the plywood with a random orbital sander to achieve a smooth, splinter-free surface.

Glue, assemble and clamp up the truck body, using soft-jaw cramps so you don't mark the work surfaces, **photo 8**. Round off the exposed ends of the truck sides with a disc sander.

## Making the wheels

Start with thickened and sanded wood. Draw out four 80mm diameter circles with compasses, and drill a 5mm diameter hole in the centre of each circle. Cut them out with a scrollsaw, **photo 9**,

Make a simple jig which can be cramped to the disc sander table. Mine is a board offcut with a 5mm dowel positioned so that each wheel can be held on it and rotated against the revolving sanding disc to ensure that it's completely round, **photo 10**. When you've done this, de-burr all the edges.

## Towing bracket and toggle

This bracket neatly attaches the cord to the truck. Shape the wood, **photo 11**, and drill and countersink the two holes for the fixing screws. Then drill and counterbore a hole through it for the cord.

Knot this, heat-seal the end and thread it through the hole in the bracket. Alternatively, you can use a blob of super-glue or hot-melt glue to seal and secure the cut end of the

### BRICK TRUCK CUTTING LIST

All dimensions are in millimetres

Part	Qty	L	W	T
Bricks (makes 20)	1	1200	50	50
Side	2	340	50	12
End	2	218	50	12
Base (plywood)	1	268	218	6
Wheels (makes 4)	1	360	90	12
Bracket	1	70	30	20
Toggle	1	80	25	25

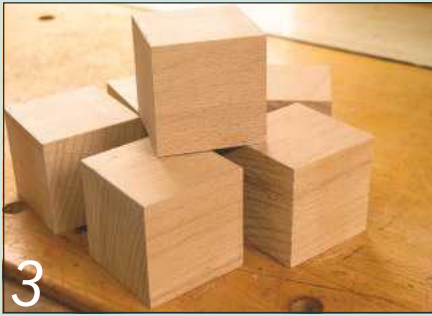
You will also need: four 50 x 5mm (No 10) roundhead brass screws, four washers to fit the screws, 1m of 6mm nylon cord and two 20 x 3mm (No 4) countersunk brass screws.



1 Use a hand mitre saw to cut the blocks. Note the red length stop cramped to the saw table



2 Check that all the blocks are perfectly square in each dimension



3 Sand all the cut edges smooth. The blocks are now ready for chamfering and rounding off



4 Lightly chamfer the edges of each block with the disc sander table set to an angle of 45°



5 Round off the chamfers with a drum sander. Note the extractor pipe used to collect the dust



6 Cut the 12 x 6mm grooves for the ends. The cutter guard has been removed for clarity



7 Cut the 6mm wide groove in the sides for the plywood base. Again the guard has been removed



8 Glue and cramp up the truck sides and the base, and set the assembly aside to dry



9 Mark out the wheel circles and drill a centre hole in each one. Cut them out with a scrollsaw

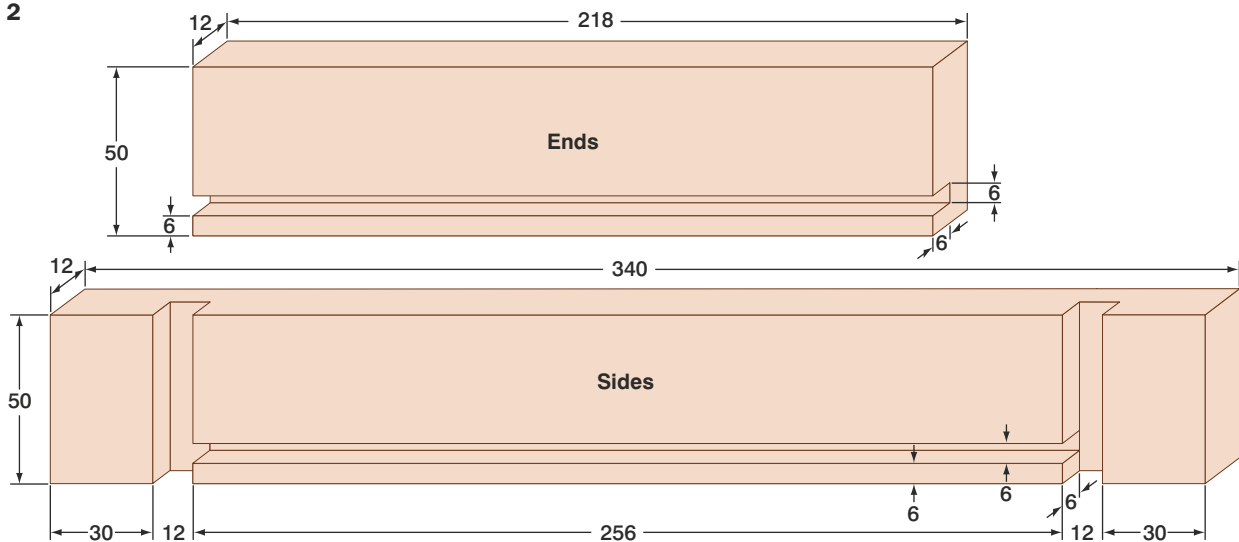


10 Sand the wheels to get them perfectly round. I used a simple jig cramped to the router table



11 Cut the towing bracket to size and shape, drill the cord and screw holes and sand it smooth

Fig 2





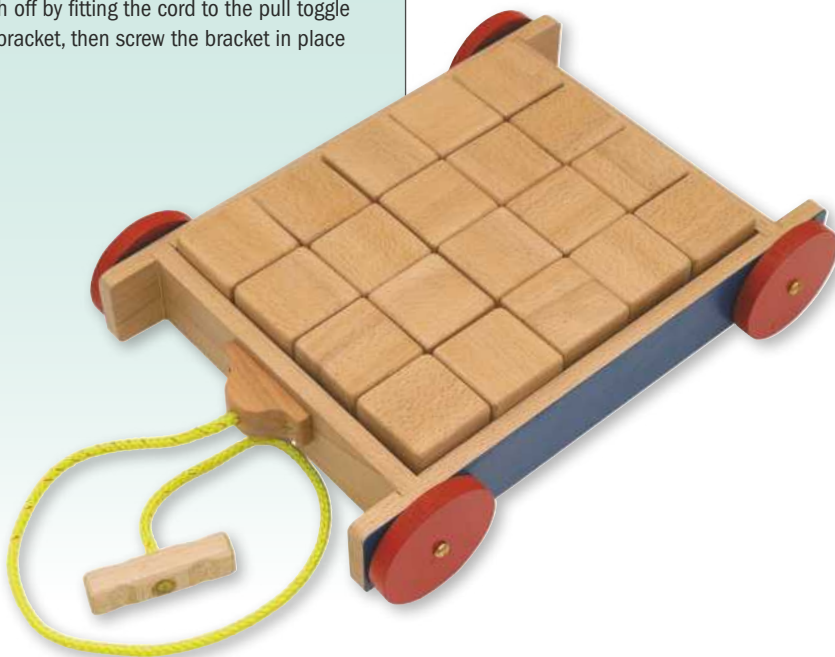
**12** Varnish, stain, paint or decorate all the parts to taste before starting the final assembly



**13** Attach the wheels to the truck with screws driven through the truck sides and into the ends



**14** Finish off by fitting the cord to the pull toggle and bracket, then screw the bracket in place



## Disc sanders

■ You can expect to pay around £100 for a dedicated disc sander. A model with variable speed is a big advantage when dealing with very hard woods or plastics. The machine is a very useful tool for making wooden toys, where a smooth finish free from splinters is essential. Because so much fine dust is produced, it's important to choose a machine which can be linked to a dust extraction system.

### Tips for using a disc sander

- If you want accurately square sanded edges, use a try square to check that the table is at right angles to the disc.
- If you're using a mitre guide, double-check the setting with a set square or protractor even if the guide is calibrated. Set the table at a 45° angle to chamfer edges, **photo 1**.
- If the distance between the disc and the table is too wide, there's a danger that thin sections of wood could be drawn down into the gap with disastrous results.
- Don't sand glued, painted or resinous wood surfaces because the abrasive will quickly clog up.
- You can remove worn-out self-adhesive abrasive discs with the help of a hot air gun or hairdryer, **photo 2**.
- You can clean a clogged disc effectively with a special cleaning block held against the rotating disc, **photo 3**. These blocks are available from Axminster Tools (03332 406406 or [www.axminster.co.uk](http://www.axminster.co.uk)).



cord. Screw the bracket to the truck body with two 20mm No 4 countersunk screws.

Shape the pulling toggle from a solid piece of hardwood, with the central hole once again counterbored to take the other end of the glued-in cord. The parts are now ready for assembly, **photo 12**. Paint, varnish and decorate the truck and wheels as required.

### Final assembly

Drill pilot holes for the wheels in the sides of the truck so the screws go through the sides and into the ends. Position them so they project about 12mm above the top edge of the truck body.

Screw on the wheels using 50mm No 10 roundhead brass screws, with a washer between each wheel and the side of the truck, **photo 13**. Check that each wheel rotates freely. Finally, screw on the towing bracket, **photo 14**, and load up the bricks ready for action.

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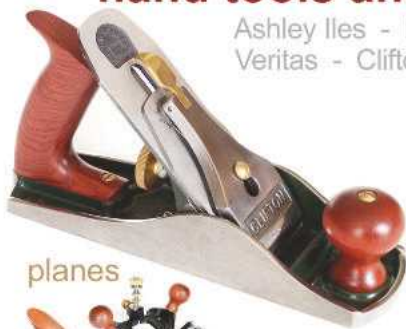
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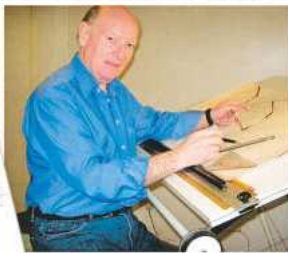


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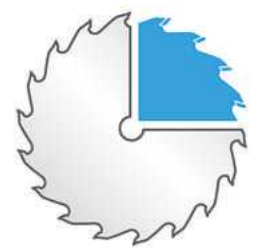
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BY ALAN HOLTHAM

# Gone to rot!



1  
Moulds affect only the surface, while stains penetrate more deeply

**Spalting is a by-product of the rotting process that affects all wood to a greater or lesser extent. It's caused by moulds and fungi, and can create many different and beautiful colours and patterns in the wood. This makes spalted wood highly prized for its looks, especially by turners**

**W**hile there are many examples of wooden artefacts that are a thousand years old but still in perfect condition, the inherent tendency of wood to decompose and return back to nature is always there. It's merely held at bay by Man, but no matter how long the timber has survived, it takes only a minor change in environmental conditions to trigger off the decay. Left in the wild, trees age and die, and then rot away and return

nutrients to the soil to begin the growth process over again. However, we can delay this process, primarily by getting the wood properly dry during seasoning.

#### **Cause and effect**

Decay can be brought about through a number of agencies such as bacteria, insects and most importantly, fungi. There's often an interaction between them, making it difficult to judge which is cause and which



2

The earliest stage of rot infestation usually causes some form of staining



3

Some wood-destroying fungi colonise logs only after they have been felled



4

Others prefer to attack sawn timber while it's being seasoned



5

The most dangerous fungi of all, such as the dreaded dry rot, attack wood while it's in service



6

The fruiting body of a fungus generates spores that disperse and spread the infection

is effect. Whatever the cause, some of this degradation can work to our advantage as woodworkers, producing some amazingly decorative effects. Spalted timber is a prime example of this relationship, the wonderful patterns being the result of a fungal infection.

### The three degrees

Fungi are very low forms of life and are unable to produce food for themselves like a living plant, so to survive they take nourishment from the timber they have infected. The degree to which this affects the timber gives us a broad classification of the huge fungal group into moulds, stains and rots.

Moulds are infections of the wood surface, **photo 1**, whereas stains penetrate more deeply into the actual cell structure. Both feed off the carbohydrate stored in cell

cavities, but don't actually affect the cell structure. The most obvious symptom is discoloration – usually a bluey grey colour that is disfiguring rather than attractive.

Rots, on the other hand, are far more destructive. They feed by producing enzymes that break down the cell structure itself. In the early stages of attack the first symptom is again some form of staining, **photo 2**, which is often referred to as 'dote' and only moderately affects the strength properties of the timber.

### Wasting away

The process of decay is progressive, however, and advanced decay results in a softening of the wood and eventually total loss of strength. There are many totally different forms of attack. Some fungi thrive

only on the heartwood of standing timber, leaving behind the characteristic hollowed-out shell. Others colonise logs only after they've been felled, **photo 3**, or sawn timber while it is being seasoned, **photo 4**.

Perhaps the most important group from an economic viewpoint are the fungi that attack timber after it has been put into service, including the highly damaging forms such as dry rot, **photo 5**.

### Dispersing spores

Wood-rotting and sapstain fungi belong to a huge group of plants that includes mushrooms and toadstools. These large visible growths are the fruiting bodies of the fungus, **photo 6**. They produce the single-celled spores which disperse to continue the colonisation. The damage is caused by their vegetative feeding system, which is often not visible on the surface, but consists of hundreds of fine tube-like structures called hyphae which grow rapidly through the wood structure, devouring both the cell walls and their contents.

### Four ways to flourish

Like all living structures, fungi need some basic conditions in their favour to survive and thrive. Knowing what these conditions are and then regulating them gives us a real means of controlling them. There are four requirements.

■ **Temperature** The optimum temperature for fungal development is in the range of 20 to 30°C. There is little activity beyond these extremes, which explains the sudden burst of summer activity in temperate regions with cold winters. Unfortunately this is also the temperature range within which we like to live.

■ **Oxygen** There must be an air supply for rot to occur; fully waterlogged timber rarely decays because of the lack of oxygen. This is why in some countries logs are often stored in water until they are ready for conversion, and why timber piles for harbours and piers will last forever when fully immersed.

■ **Moisture** The ideal moisture state for fungal attack is at (or just above) the fibre saturation point. It is not until wood is dried below about 20 per cent moisture content that you can be sure it's safe from attack. Interestingly, drying infected timber doesn't necessarily kill the infection. It may just lapse into a dormant state, ready to return if the moisture content rises again. Dry rot is an exception, in that it usually dies off in prolonged dry conditions.

■ **Food** The wood on which fungi live provides the necessary food source. The fungi actively break down the cell walls and their contents, particularly the stored

carbohydrate in the sapwood.

The heartwood of some trees contains deposited chemicals that are poisonous to fungi, rendering these species resistant to decay. This explains why some timbers such as oak are naturally durable; fence posts exposed to the weather for years quickly lose all their sapwood, but the heartwood core remains untouched. Jarrah, often used to make railway sleepers before concrete took over, still looks perfect after years of service exposed to the weather, **photo 7**, showing no sign of staining, fungal infection or decay.

All of these conditions must be in place for rotting to occur. Lack of one of them usually halts the process, even if all the others are present. As an example consider bog oak, often buried for thousands of years but with no available oxygen. It can be dug up perfectly intact, but very soon after being exposed to the air it starts to fall apart.

### Identifying fungi

The two main constituents of wood are lignin and cellulose, and identifying which of these is attacked helps to finger the particular fungus involved. The brown rots feed mainly on cellulose, while the white rots feed on both cellulose and lignin. The degree to which either of these substances is affected results in a different form to the decay – cubic rot, pocket rot and so on.

As lignin is the main constituent holding all the wood cells together, anything that attacks that is particularly destructive. A lot of the pigmentation of wood is formed in the lignin, so white rots have a pronounced effect on timber colour. If white rot becomes really advanced the timber becomes pale, soft and spongy, **photo 8**.

### Standing tree fungi

Fungi that attack standing trees are responsible for losses to the forest owner, but they will rarely affect us as timber users because once seasoned, such wood is safe from further decay from this fungus group. An exception here is brown oak, which is normal oak that has been infected by the Beefsteak fungus (*Fistulina hepatica*). This gains entry to the tree through a wound of some sort, but causes no damage to the living tree apart from extracting nourishment. However, it causes chemical changes which result in a highly-prized brown coloration that highlights the wonderful figure in the oak, **photo 9**.

### Log and plank fungi

Sometimes trees are felled and left lying for some time before being converted into



7 Some woods, such as oak and jarrah, are naturally extremely durable



8 White rot leaves the affected wood looking extremely soft and spongy



9 Highly-prized brown oak occurs when oak is infected by the Beefsteak fungus



10 Converted wood is also at risk if it's kept in adverse drying conditions



11 The initial infection affects only the wood's colour, not its strength

planks. This delay before conversion and drying is the prime cause of infection of logs by decaying fungi. The potential problem is far worse in tropical countries, where warmer temperatures mean that fungal development is much more rapid. These climates also tend to harbour more variety in the way of bark-boring insects and ambrosia beetles.

Converted timber kept in adverse drying conditions is just as likely as logs to be infected with fungi of some sort, **photo 10**, particularly those timber species which don't have naturally resistant heartwood.

### Finished wood fungi

The only sure way to prevent wood-rotting fungi from attacking timber in its finished situation, such as in a building, is to use

sound, kiln-dried material which is free from fungal infection in the first place, and then to provide sufficient ventilation to prevent it from becoming damp. The very destructive 'dry' rot (*Serpula lacrymans*) is able to thrive in conditions of relatively low moisture content, and any infection it causes must be treated very seriously indeed if major structural damage is to be avoided.

### Why spalted wood?

The first stage in the decay process is the invasion of the timber by a range of different fungi, which start to break down the wood material, often producing a variety of colour changes in the process. It is when these colour changes produce decorative effects, but without substantial loss of structure, that the wood is said to be 'spalted'.



12

When different invading species meet, a black line often develops between the zones



13

If several fungal species are involved, the lines become more decorative



14

There is often a distinct boundary between spalted and unspalted wood



15

Secondarily decayed timber can be attractive but may be structurally unworkable

It is only in recent years that the merits of partly rotted wood as a decorative woodworking material have come to the fore. There is nothing more spectacular than a highly spalted piece of wood. The rich intermingling of colours occurring in a stunning kaleidoscope-like pattern can be almost breathtaking.

## How spalting occurs

What actually happens here is an extremely complicated biological process, the outcome of which depends on a number of interrelated factors. Fungal spores are ever-present in the atmosphere, floating round us all the time. If one happens to land on a piece of wood which is in a suitable state for growth, then the infection begins. Once the fungus is established, it starts



16

Spalted wood can be difficult to work, as the density can vary from area to area

spreading out via a mat-like mass of tiny roots called the mycelium. As the individual strands of the mycelium, the hyphae, grow out, they digest the wood material ahead of them. Usually this first infection by the pioneer fungus has little effect on the strength of the timber, merely discolouring it, **photo 11**. There is not just one species involved here, but dozens of different types, some specific to a particular wood species or group.

## Multiple invasion

It is only when another species of fungus joins in that spalting, as opposed to rotting, starts. Each fungus – and there may be many in a single infection – makes its own way through the wood, leaving a different colour behind as it goes. Whenever one species comes up against another, then a

black zone line is formed. This is what characterises spalted wood, with the pockets of different colours each surrounded by a black line, **photo 12**.

Sometimes there may be only a couple of different fungal species involved, so the spalting is quite bland, but if there are lots of them all intermingling then the zonal lines become much more numerous and decorative. They also vary in width, from the thickness of a human hair up to several millimetres across, **photo 13**.

There's a lot more to this, though, as one fungus may eventually overcome another, usually by producing what are effectively antibiotics, so spalting is not inevitable. It all depends on the infecting species.

The arrangement of the spalting appears to follow no specific evolutionary pattern either. Sometimes it seems to follow the direction of the rays, while at other times there may be a distinct boundary between spalted and not, **photo 14**.

## Using spalted wood

The trick is to use the wood when it is still infected by these pioneer fungi, but while the composition is still reasonably sound. The next stage is infection by secondary fungi that are usually much more specific in action and will totally destroy the timber. The yellow patches of secondarily decayed timber can sometimes be quite decorative, but you have to strike a balance between this looking attractive yet being unusable as a material, **photo 15**.

Light-coloured woods are usually more susceptible to infection, having less natural resistance, a property usually imparted by the chemicals deposited in the heartwood of dark timbers. So beech, sycamore and maple will spalt readily, whereas walnut or elm is less likely to do so. These dark woods tend to need infection by a specific fungus, which is able to overcome the toxic effect of their deposited chemicals.

## A final word

Using spalted wood also has its own problems. In a well-figured piece the different colours produced by the different fungal species all leave wood with different densities. Consequently, when you come to work it some areas will cut cleanly, some will rip a bit and some will just pull out in chunks, making it a very frustrating experience, **photo 16**. There are also the health aspects of inhaling the infected dust to be considered as well.

I'll take a look at all these pitfalls and their solutions next month, and illustrate them by turning a piece of spalted beech for you.

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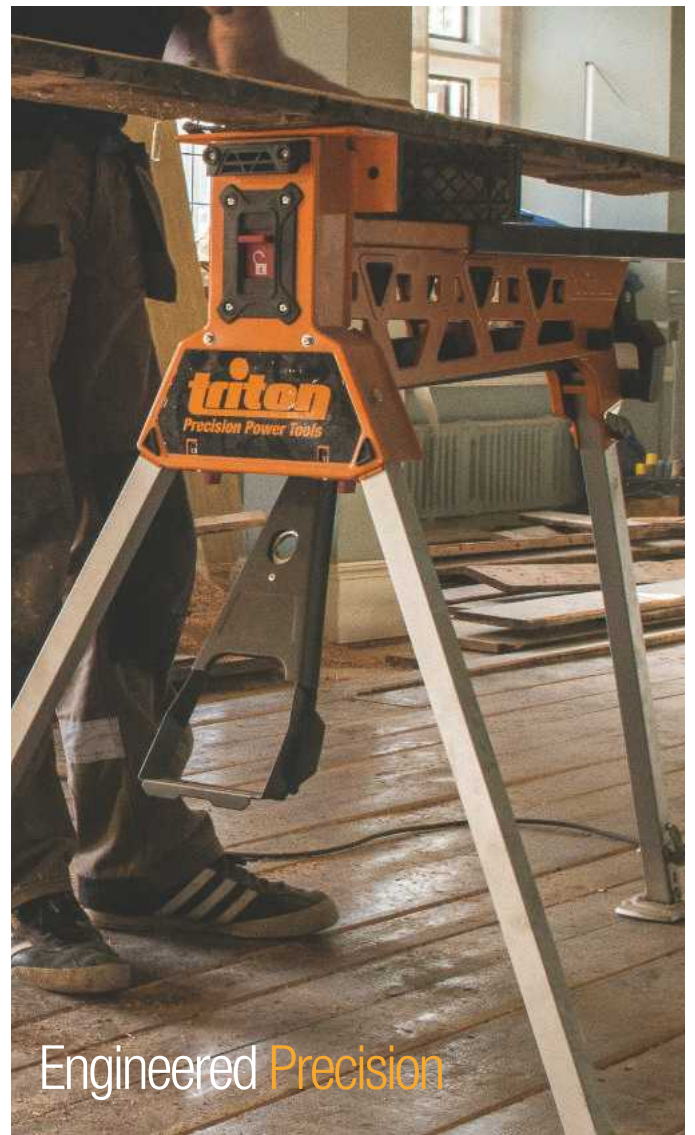
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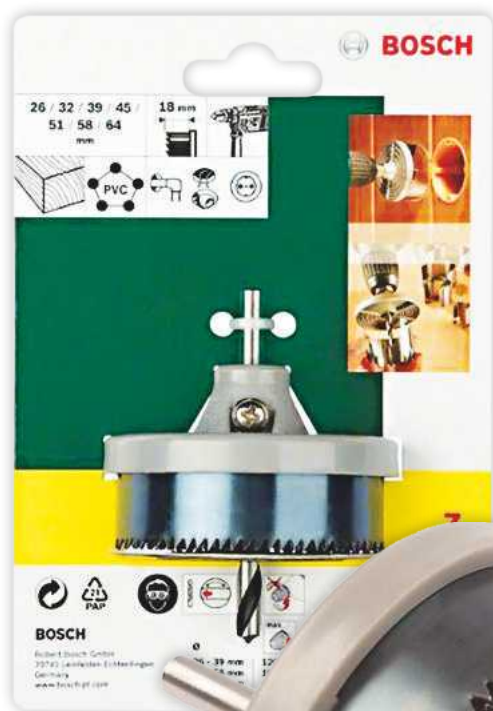
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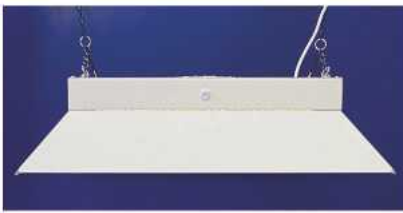
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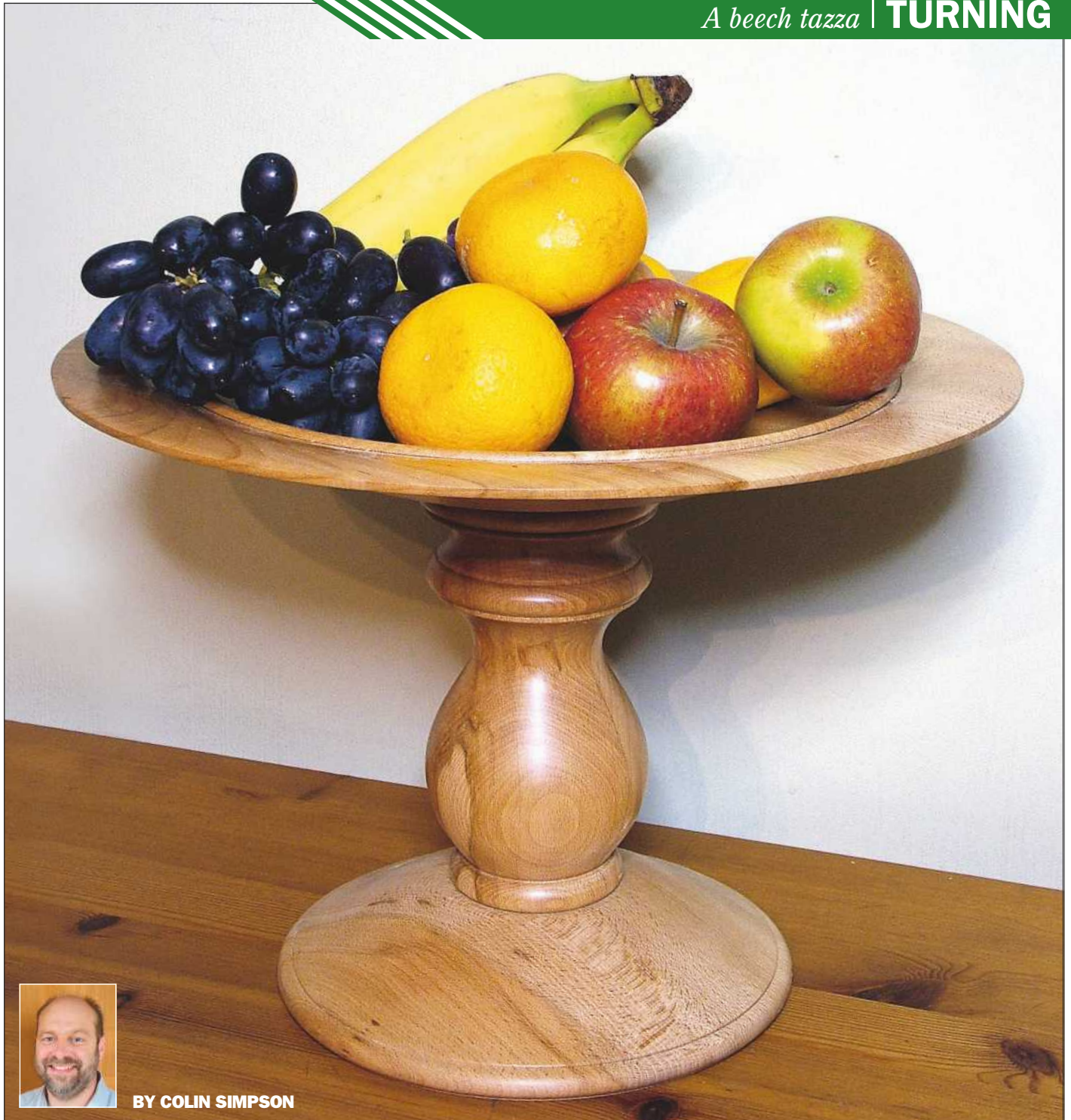


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BY COLIN SIMPSON

# The cup that cheers

**This month's project combines both spindle and faceplate turning, and is something my wife has been asking me to make for a while. It's a flattish bowl on a decorative stand, known as a tazza**

I've made my *tazza* from beech, but almost any wood will be suitable. It has a bowl about 330mm in diameter and a base 190mm across. The stem is 180mm high and 100mm in diameter at its widest point.

#### Start at the bottom

Find the centre of your base blank and drill an 8mm hole for a screw chuck, **photo 1**. Mount it on the lathe, flatten it, cut a gentle



1

Most modern machined screw chucks need an 8mm hole in the blank



2

If the chucking recess isn't going to be turned away, add a little decoration with a skew chisel



3

Turn a decorative bead around the bottom edge of the base with a  $\frac{3}{8}$ in spindle gouge



4

Flatten the top using a pull cut with a fingernail profile bowl gouge

concave shape on the underside and turn a recess for your chuck. I won't be reverse-chucking this piece to turn the recess away, so I decorated it with a couple of beads, formed with a skew chisel, **photo 2**.

Next, true up the edge of the blank with a small bowl gouge and turn a decorative bead on the bottom edge using a 10mm spindle gouge, **photo 3**. Sand, seal and polish the underside, then remove it from the screw chuck.

### Boring the base

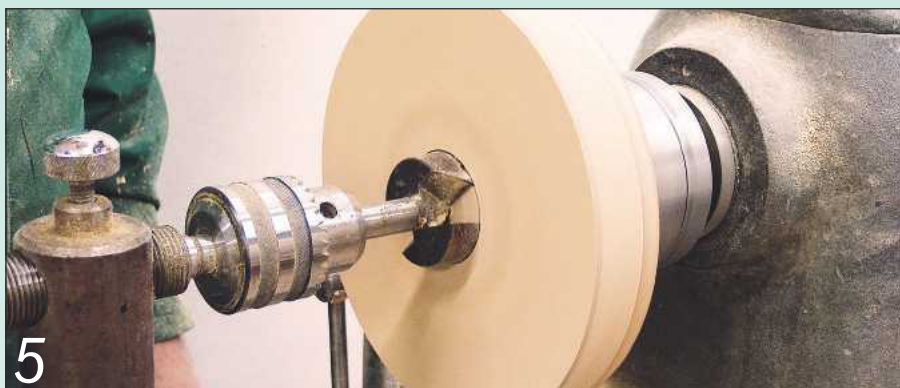
Mount the blank on your chuck jaws and true up the top surface, using a pull cut with a fingernail-profile bowl gouge, **photo 4**. Then mount a 50mm saw-toothed bit in a Jacobs chuck in the tailstock and drill a 25mm deep hole on the base for the stem to fit into, **photo 5**. If you don't have a suitable bit, this recess can be formed using a series of plunging cuts with a parting tool.

Draw a circle about 10mm wider than the hole and keep this area flat so that the stem can sit on it. Now shape the rest of the top of the base using a bowl gouge, **photo 6**. I wanted to keep the base quite simple, but you can make it as ornate as you like. I felt that the edge bead needed a little extra definition to make it stand out more, so I cut a small shoulder just above it with a parting tool, **photo 7**. This also created a shadow line that attracts the eye.

### Hand or power?

Sand, seal and polish the rest of the base, **photo 8**. I much prefer to power-sand bowls; it's quicker than hand-sanding, and I think it gives a better finish. If you power-sand, don't press the whole disc onto the wood, as this will inevitably cause the sander to skate. Instead use just the edge of the disc.

Note that I've positioned the dust extraction very near to where I'm sanding. I've heard some people say that they don't



5

Drill a 50mm diameter hole in the base with a saw-toothed or Forstner bit



6

Shape the rest of the base with a bowl gouge to your choice of profile



7

Cut a small shoulder with a parting tool to define the bead a little more



**8**  
Power-sand, seal and polish the base.  
Have your dust extraction nearby

like power sanding because it creates too much dust. If this is the case, then they're over-sanding. Sanding by hand will of course create the same amount of dust, but just far more slowly!

### Tackling the bowl

The top bowl is mounted on a screw chuck in the same way as the base. As you did earlier, flatten the underside and turn a recess to fit your chuck. Draw a circle 10mm wider than this recess, and again keep this area flat so the bowl sits firmly on the stem.

True up the edge of the bowl, **photo 9**, and then use a bowl gouge to shape the underside, **photo 10**. I cut mine to an ogee shape. Sand and polish the underside, but take great care not to get any polish in the chucking recess. as this where the stem will be glued in later.

### Hollowing out

Turn the bowl around, mount it in your chuck jaws and flatten the top surface. I cut the rim first, before hollowing the centre using a bowl gouge, **photo 11**. I then cut a narrow bead where the bowl meets the rim, using a small skew chisel held on its side, **photo 12**.

Try to get a good finish on the inside of the bowl with the bowl gouge; you can also use a round-nosed scraper here if you wish. Remember to use this with the handle held slightly higher than the cutting edge, and aim to get fine shavings, **photo 13**. If you are only getting dust, then sharpen the scraper. Finish off by sanding and polishing the rest of the bowl.

### Preparing the stem

I didn't have a piece of beech 100mm square that had similar markings to those on the base and bowl, so I decided to glue two 50mm thick pieces together to make up the thickness. These were cut from the



**9**  
Use the tip of the bowl gouge to true up the edge of the bowl blank



**10**  
Here I'm using a pull cut to shape the underside of the bowl



**11**  
Define the rim first, before hollowing the centre using a bowl gouge



**12**  
Cut a bead next to the rim with a skew chisel held on its side



**13**  
Use a bowl gouge or a round-nosed scraper to refine the inside surface of the bowl



**14**  
Turn the stem blank to a cylinder using a spindle roughing gouge



**15**  
A peeling cut made using a skew chisel quickly cuts the tenons to size



**16**  
Work from the tailstock end towards the headstock. Cut the first bead...



**17**  
...followed by the main section, which in this example I've shaped like a teardrop



**18**  
Cut the cove between the top two beads next using the spindle gouge



**19**  
When you cut the beads in this way, sharp fillets are cut automatically



**20**  
Finally, cut the bead at the top of the stem, once again leaving a fillet



**21**  
Use the lathe as a clamp when gluing up the three components to ensure accurate alignment

same board as the rest of the stock.

Find the centres of both ends of the stem, mount the piece between centres and turn it to a cylinder, **photo 14**. Size the tenons on both ends using a peeling cut with a skew chisel, **photo 15**. Mine were 25mm long and 50mm in diameter at the bottom end and 8mm long by 55mm diameter at the top, to fit the chucking recess on the underside of the bowl.

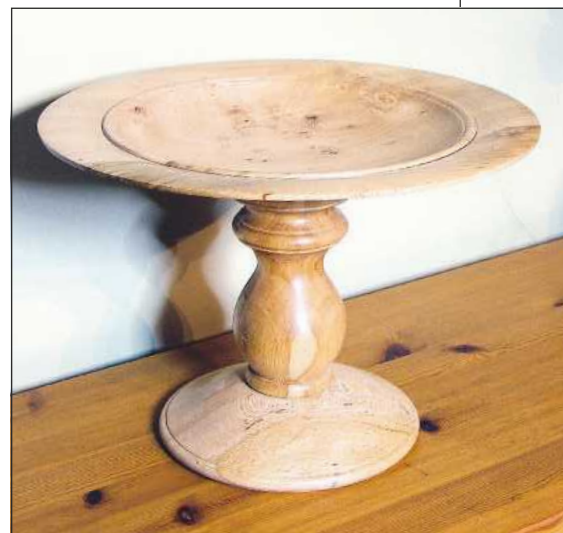
### Simple shaping

The rest of the stem is simple spindle turning. It's good practice to work from the tailstock end towards the headstock. Use a  $\frac{3}{8}$ in spindle gouge and cut the first bead, **photo 16**, followed by the main teardrop shape, **photo 17**.

I cut the cove between the top two beads next, **photo 18**, and then the bead itself, **photo 19**. Finally, create the bead at the top of the stem, **photo 20**. Spindle turning always looks crisper if you define each change of shape with a fillet. This is cut automatically as you cut the bead – see **photo 20** again. Gently sand the stem, taking care not to soften or remove the crisp detail; then seal and polish it as before.

### Itsa tazza!

You can now glue the three pieces together. I like to use the lathe as a clamp, so mount the base in the chuck jaws again, glue the stem into it and glue the bowl to the other end of the stem. Bring the tailstock up to apply a little pressure on the work until the glue dries, **photo 21**. Note that I have a soft rubber pad held in a Jacobs chuck in the tailstock to protect the interior of the bowl. It's also important to align the grain on the various components when cramping them up, as this will make the finished piece look so much better.



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BY CHRIS CHILD

# Humpty Dumpty

**This combined egg cup and side bowl was made from a single disc of English cherry – a lovely creamy-textured wood that’s easy to work, making it an ideal turning timber for beginners**

**S**tart off with a disc about 150mm in diameter and 80mm thick. Attach it to the lathe using either a screwed-on faceplate or a single screw chuck, **photo 1**. You’ll need to drill a pilot hole in the centre of the disc first. Make sure that the face of the disc is flat and winds up hard against the face of the faceplate.

The next thing to do is set a suitable lathe speed of about 700rpm. When turning any hollow vessel project, it’s an advantage to have a lathe with a swivelling headstock.

This enables the work to be rotated at 90° to the lathe bed, providing you with better access to the work. You want to be able to stand in a safe, comfortable, well-balanced position, facing the workpiece without having to stretch awkwardly across the lathe bed or compromise the cutting angle of your tools.

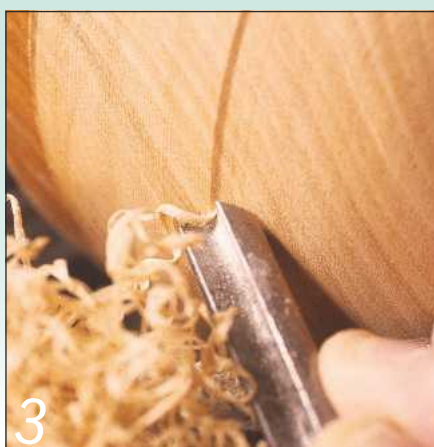
Before you start turning, put on a face shield. This is especially important when you’re turning large-diameter work, as the speed generated at the rim of the disc is much higher than on spindle work.



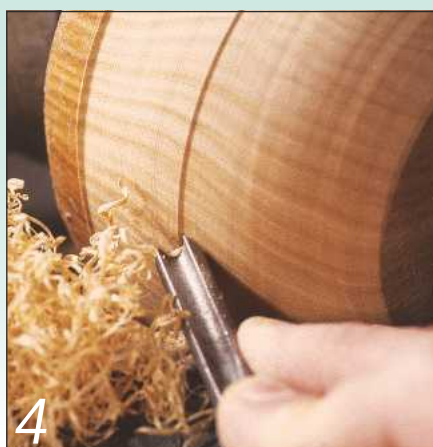
1 Fit the disc onto a screw chuck. You'll need to drill a pilot hole first



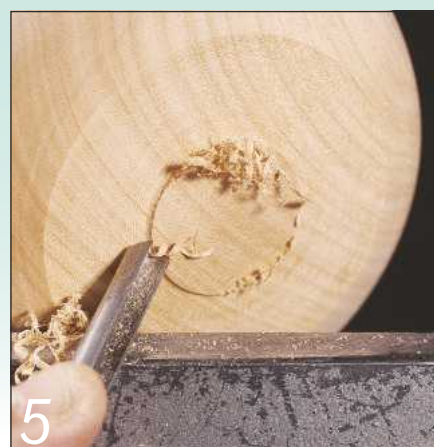
2 Start turning away the corner first so a simple facet is formed



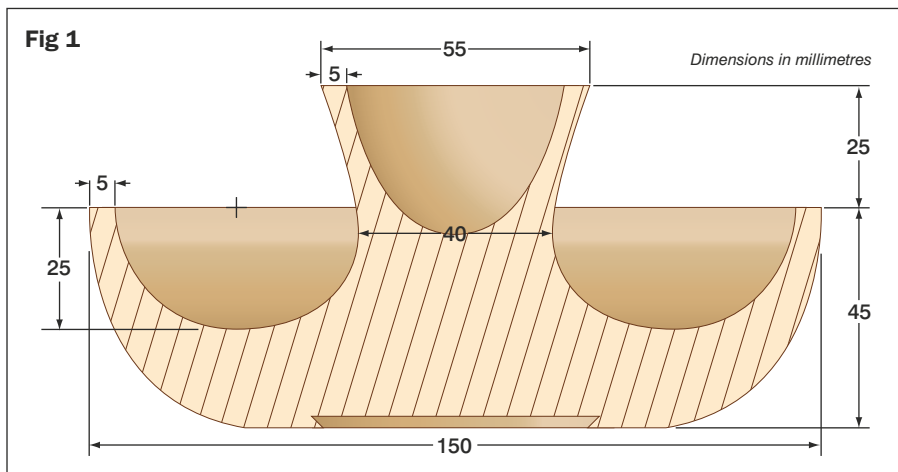
3 Swing the gouge in an arc to form the curved side



4 Cut more finely with a slower rate of feed



5 Flatten off the bottom of the bowl



## Two-stage process

I've used a two-stage method to turn this egg cup and side bowl. This involves shaping the bottom of the bowl first, and then reversing it and hollowing out the cavities with the work held in a chuck. The advantage of working in two stages is that when turning the sides of the bowl, the cut is directed with the grain, leaving the grain fibres unruffled and smooth. With the bowl turned in the single-stage method, you have

to cut the sides of the bowl in the opposite direction to the grain. This bends the fibres back and causes a ruffled finish.

I turned the egg cup and bowl using just one tool – a 1/4in bowl gouge, ground with a 40° bevel and a standard straight-across edge. The bevel needs to be flat and free from secondary facets, as it performs like the sole of a plane, gliding on the surface of the work, while the cutting edge cuts the waste away.

## Left-handed grip

Even though I'm naturally right-handed, I hold the gouge in a left-handed mode to cut the bowl's base and side shape. This enables me to look down the back of the tool and judge the angle of the bevel in relation to the workpiece surface. It also allows me to see the precise point at which the cutting edge of the tool comes into contact with the work.

Because the left hand anchors the tool handle against the body and the right hand is positioned between the back of the tool and the work, most of the pressure on the tool is exerted downwards onto the toolrest. This helps avoid the tendency to press the bevel too much against the workpiece, which causes uneven cutting, leading to a rippled or wave effect on the work's surface.

## Starting the job

Start cutting the corner away first so a simple facet is formed. This can then be rounded off to form the curved sides of the bowl. Hold the gouge firmly against the tool rest, slightly on its side with the bevel in line with the face of the work surface. Start the cut by re-angling the tool so that the cutting edge of the gouge is engaged with the work

at the base of the flute, **photo 2**.

The tool must be held rock-solid in the path of the oncoming wood and mustn't be influenced by the uneven surface it's cutting. After the first pass, start a fresh cut slightly behind the start of the previous one. The action of the gouge slices through the wood fibres at their base and breaks them away at the side in one continuous action, while the bevel of the gouge glides over the smooth new surface that has just been produced. As the work proceeds, you will need to move the toolrest nearer to the work to maintain control over the cut.

### Forming the bowl

To form the curved sides of the bowl with one continuous cut, swing the gouge slowly in an arc so the bevel of the tool remains parallel with the curve, **photo 3**. To do this while still supporting the tool handle against your body, stand in the position where you anticipate finishing your cut, lean back so that you start the cut slightly stretched out and off balance, and then slowly move back into a balanced position as you finish the cut.

Subsequent cuts to improve and modify the shape can be made by slicing off fine fillets. Start with the bevel flat on the surface and then feather the edge of the gouge into the surface so that no entry or exit sign is visible at the beginning or completion of the cut.

A scraper can be used to shape the outside of the bowl, but this tool will usually undo the clean finish produced by the gouge, causing two broken or roughed-up areas where the surface has been scraped in the wrong direction. The best finish is achieved with a freshly sharpened gouge.

Perform this in the same way as the continuous shaping cut, only cut much more finely with a slower rate of feed. If possible, use a sharp unused part of the gouges' cutting edge, as shown in **photo 4**. The gouge is placed slightly on its back, so the side of the cutting edge is engaged.

To clean and flatten off the base, simply slide the gouge across using the same slicing technique as for the sides, **photo 5**.

### Forming the dovetail recess

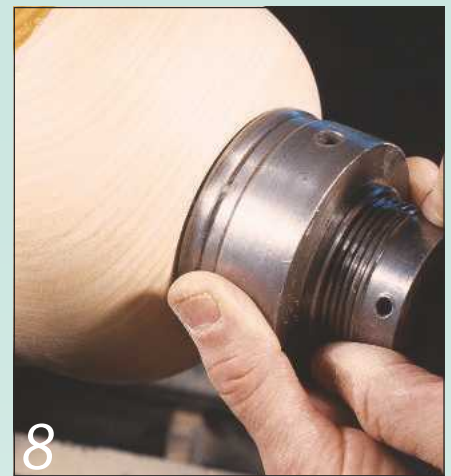
Cut the recess in the base of the bowl with a small square-ended scraper, **photo 6**. Place the tool horizontal to the work and hold it firmly down on the toolrest so that it's absolutely rigid when it's performing the cut. There must be no tool vibration, because this will effect the centring of the workpiece when it comes to fitting it onto



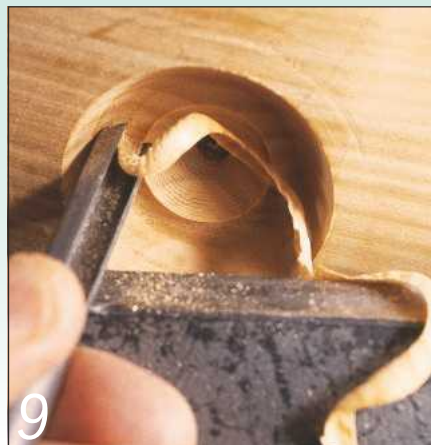
Form the recess for the chuck jaws in the base of the bowl using a small square-ended scraper



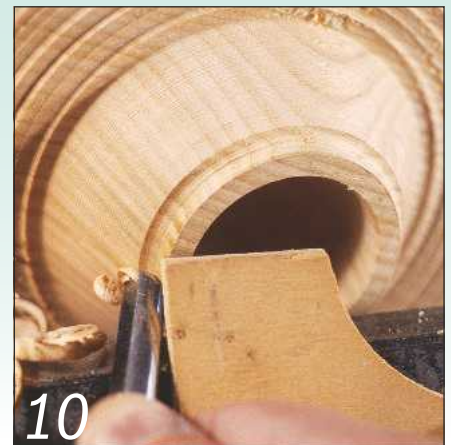
Then cut the dovetail in the side of the recess



Check that the chuck fits well and runs true



Start hollowing out the shape of the egg cup with the gouge held on its side



Use scrap wood as a vertical tool post to support the back of the gouge when starting the cut

the chuck. The dovetail is cut with a specially ground scraper which forms the same profile cut as the chuck jaws, **photo 7**. It's also very important that it remains absolutely rigid while it cuts the profile shape of the dovetail. Before doing anything else, test that the chuck fits properly, by hand-tightening it into the recess and rotating it to make sure that it is centred correctly, **photo 8**.

### Sanding the bowl

Wear an effective dust mask when sanding turned work. I use J-flex aluminum oxide cloth abrasive for almost all my woodturning needs, because it's long-lasting and the flexibility of the fabric makes it ideal for the outside and the more difficult inside concave curves that occur in a lot of turned projects.

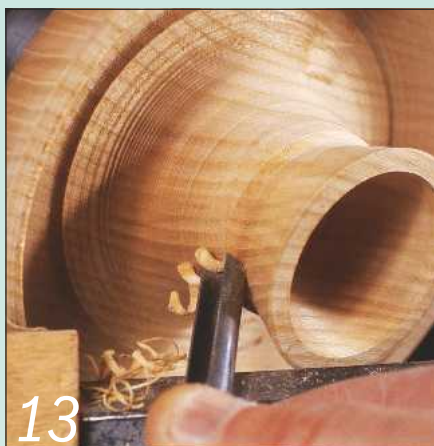
I start off with 100 grit and work my way through to 240 grit before finishing off with



**11**  
Reposition the tool post when starting the cut to form the outer rim of the side bowl



**12**  
Work down one curve of the outer side bowl at a time...



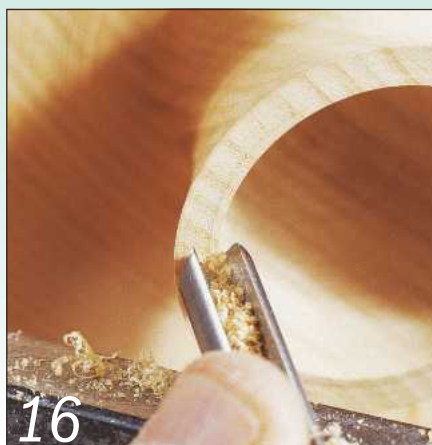
**13**  
Then work down the other side to form the round-bottomed cavity of the bowl



**14**  
Use the lightest of cuts to finish off the bottom of the hollow



**15**  
Use the finest of cuts with the flute of the gouge held upwards to create a smooth finish



**16**  
Lightly trim the top of the rim of both egg cup and bowl using the same technique

400 grit, using each successive grade to remove the scratch marks of the previous grade. You'll need to be quite liberal with the use of your abrasive if you want to achieve a good finish.

The purpose of the sanding is not just to make the surface smooth but to remove tool marks, and these usually become

visible only when you are applying the finer grades of abrasive. Quite often you will have to go back over your work again with the coarse grit to remove some stubborn blemish which is too deep to be removed with the fine or medium grit.

Don't be tempted to use your abrasive when it's blunt, as this will often cause the

fine end-grain cracking which can spoil an otherwise perfect piece of turned work. Watch the steady stream of dust which should accompany your sanding, and as soon as it disappears, change to some fresh abrasive.

## Hollowing out

Fit the chuck onto the lathe, and then hand-tighten the bowl to the chuck before using the tommy bars to lock it on tight. To start the cut, position the gouge on its side with its bevel at a 45° lateral angle to the work surface, **photo 9**. The handle is held so that a 45° vertical cutting angle is attained and the height of the toolrest is adjusted so that the cutting edge of the tool is brought into contact with the centre of the bowl face. A small cut is performed which is then repeated one step back from the previous cut and going further into the centre of the disc. This produces the rounded cavity of the egg cup, which you can test for size using a standard egg.

## Forming the side bowl

The next stage is to hollow out the side bowl. First remove all the waste to each side of the egg cup by working the gouge in the opposite direction to that used earlier. As you get closer to the finished width of the sides of the egg cup, fit a vertical tool post in the form of a piece of waste wood G-clamped to the tool rest, **photo 10**. This provides a rigid support at the back of the gouge, allowing it to be fed into the rim of the bowl at a 90° lateral angle without it slipping and spoiling the crispness of the work's rim. Arc the gouge while feeding it forward and form one side of the side bowl and the sides of the egg cup. Test the thickness between your fingers after each cut.

Reposition the tool post for cutting the outer rim of the bowl and work the gouge in the other direction, **photo 11**. By working down one curve of the side bowl, **photo 12**, and then the other, **photo 13**, you gradually form the round-bottomed cavity of the bowl. **Photo 14** shows the gouge making a fine finishing cut on the inside of the side bowl.

At the bottom of the cavity where you are at full stretch, particular care needs to be taken to avoid digging in with the gouge. Take very light cuts with the flute of the bowl gouge held upwards, **photo 15**. Trim the tops of the rims using the same technique, **photo 16**.

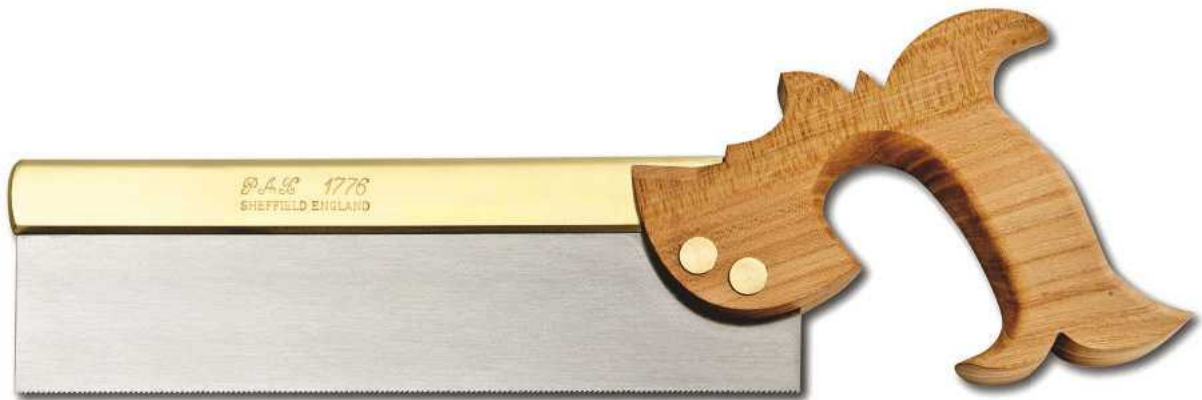
After sanding the work smooth, I finished the work with a product called Food Safe Finish, made by Chestnut Products. The finish was applied very easily with a clean cloth and left the wood looking very natural.

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*Bandsaws are essential workshop machines. This Axminster model is from their Hobby range and has good capacities, a generous work table and efficient fences*

# Axminster HBS310N Hobby Series bandsaw



**£419.94**

A good bandsaw is an essential machine in any serious workshop. It can be used to cut curved components and joints, re-saw timber and produce veneers. However, a bandsaw can cause problems, especially for the inexperienced user. It needs to be carefully set up, the blades are fragile and easily damaged, and though it looks fairly benign it's capable of inflicting considerable injuries if not used with care.

Bandsaws are available in a wide range of sizes and designs, from little benchtop models to professional floor-standing machines. This Axminster saw is the ideal size for the ambitious home user. It has a generous throat (the distance from blade to machine spine), a large cast table, robust fences and a floor stand.

### Design features

The Axminster is a sturdily built machine with a steel casing and a cast iron table. The stand is easy to assemble and provides a secure base. The top and bottom doors open independently and each has its own safety microswitch to prevent accidental activation. The alloy bandwheels have thin rubber tyres to grip the blade, and are belt-driven by an induction motor connected to the bottom wheel.

### Table and fences

The work table is well finished. It has slots on both sides of the table for the sliding mitre fence, and an alloy rail is fitted to the front on which the rip fence runs. It can be tilted to 45° for bevel cutting. At the rear of the table is another alloy channel. This is used to guide a roller bearing fitted to the far end of the rip fence so it remains parallel to the blade.

The mitre fence is a solid metal design with a large adjusting handle. It runs securely in the table slots and is easy to adjust, though the scale is a little hard to read. The rip fence is a two-part design with a sliding section that can be adjusted for both thick and thin material.

### Bearings and tracking

To support the blade and ensure accuracy, an effective set of guide bearings is needed both above and below the table. This Axminster



The upper blade guides are easy to adjust using knurled knobs and locking bolts



The lower blade guides also feature three adjustable roller bearings



The two-part rip fence runs on an alloy rail at the front of the table



The mitre fence and accurate slots make light work of cross-cutting



The rip fence has a sliding section that can be adjusted for thick or thin material

model has a set of three roller bearings in both locations. They are easy to adjust using the brass knobs and hex-headed locking bolts.

Again, it must be easy to tension and set the blade. Wide blades need more tension than narrow ones. There is an adjustment wheel mounted on the top of the casing to set the tension, and on the rear is another wheel that's used to adjust the tilt of the top bandwheel until the blade runs smoothly in the middle of the tyre.

#### Extra dust extraction

Bandsaws produce a lot of fine dust, and this can build up in the casing and clog the bearings if it's not removed efficiently. Unusually this saw is fitted with a pair of 100mm diameter dust extraction ports. One is at the bottom of the lower casing; the other is mounted just below the cutting point.

#### Using the saw

For a start, the saw was very easy to assemble and set up. The blade guides are precise and efficient, and tensioning and adjusting the blade to run true was simple. I tried both cutting speeds, but found that the lower speed was better by far as the machine runs much more quietly and the cutting speed is perfectly acceptable. The table is solid and secure and both the fences work well. All the controls fall easily to hand and as a result this is a pleasant machine to use.

Axminster thoughtfully supplied some spare blades for this test, as often the supplied blade on a new bandsaw can perform badly due to poor quality or damage in transit.

#### Summing up

There's little to criticise on this saw. It's solid, well made and effective. It is easy to set up, accurate in use and has good capacities. I would be happy to have it in my workshop. **AS**

### SPECIFICATION

<b>MOTOR</b>	550W
<b>TABLE SIZE</b>	500 x 400mm
<b>TABLE TILT</b>	45°
<b>BLADE LENGTH</b>	2270mm
<b>BLADE WIDTHS</b>	6 to 16mm
<b>CUTTING SPEEDS</b>	360 or 720m/min
<b>THROAT DEPTH</b>	355mm
<b>MAX DEPTH OF CUT</b>	180mm
<b>EXTRACT OUTLET</b>	100mm
<b>WEIGHT</b>	80kg

### VERDICT

This is a good solid machine that's easy to set up and satisfying to use.

- PROS**
- Robust construction
  - Good fences and guides
  - Large work table

- CONS**
- Slightly flimsy door latches
  - Mitre fence scale hard to read

**VALUE FOR MONEY**

**PERFORMANCE**

### FURTHER INFORMATION

- Axminster
- 03332 406406
- [www.axminster.co.uk](http://www.axminster.co.uk)



The metal mitre fence runs securely in the slots and is easy to adjust

Unusually, this saw features not one but two dust extraction ports, each 100mm in diameter



The tracking and tensioning wheels and upper guard adjuster are on the back of the machine casing



The latest mitre saw from the German manufacturer Scheppach has many useful features, and is fitted with a special blade. This has teeth suitable for cutting not just wood, but plastic and non-ferrous metals as well

# Scheppach KGZ 251 sliding mitre saw

£219



The main parts of this saw are alloy castings. The turntable is 272mm in diameter, and is moved from left to right by means of the knob at the front. Alongside this knob is a lever which engages and disengages with the gates, giving pre-set fixed cutting angles. The front edge of the table is clearly marked in degrees.

### Workpiece support

The support for the workpiece extends to 420mm, including the areas at either side of the table, and this is further extended to approximately 780mm if the support wings are brought into use. The fence extends fully across the work support area, and can be adjusted to ensure it's at right angles to the blade. A work clamp is included; this locks the wood in place and can be fitted to either side of the blade. It is particularly valuable when making bevel cuts, as there can sometimes be a tendency for the wood to slide a little out of position as the cut is made.

### The machine head

The head of the machine can tilt up to 50° to the left, and a large locking lever ensures that it is firmly secured at whatever angle is required. To help with this bevel setting, there is a small protractor scale and pointer, but the scale is small and should only therefore be taken as a rough guide.

The head can be locked in the lowered position, and a secondary handle above the main one provides the means of lifting the saw, for which the sliding action should first be locked. The main handle includes the switch and guard release mechanism, and there is provision for limiting the



Movement of the turntable is controlled by moving and locking this arm



The head of the machine can be locked in the lowered position when required



The underside of the turntable has several gates for setting common cutting angles



There are limitations to compound cuts because of the left-only bevel cut

extent to which the blade can be lowered. This allows trenches, tenons, half-laps and similar partial cuts to be formed.

### Seeing the light

The laser is another feature to promote accuracy. It casts a beam directly on the cutting area, and can be adjusted to be exactly in line with the centre of the cut, or to be aligned with one edge of it. It's battery-powered and is switched on and off separately, so it needn't be used if it's not wanted, or when operating in very bright light.

### Using the saw

My first trials were straightforward cross-cutting; pieces up to the maximum in width and thickness were cut with ease. Bevel cuts presented no problems, but these can only be made to the left. Compound cuts are a combination of bevel and mitre cuts, but there are limitations to making certain compound cuts because of the left-only bevel cut. This is why more advanced designs of saw allow for bevel sawing to both the left and right.

Next I tried making cuts only partway through the wood, such as for a trench. Depending on the thickness of the material, I found that some packing was required between the rear of the wood and the fence, to allow the cut to be made fully across the workpiece.

I then cut a couple of tenons with the blade raised. It's best to have a length stop to ensure that the shoulders on both sides are in line with one another. Such a stop need be no more than a piece of scrap cramped to the fence. The control which limits the depth of cut can be adjusted to fine limits, and is designed to be cancelled very quickly.

### Cutting plastic and metal

I found a piece of plastic weatherboarding in my workshop, and made several clean cross-cuts in this. I then cut some aluminium, this time a piece of tubing of square cross-section. There was little difference from sawing wood, except that it was noisier! The resulting cuts were smoother than I expected.

All parts which contribute to the accuracy of this saw are adjustable, although as always for some angular cuts it's wise to make a trial cut in scrap wood before proceeding.

To sum up, this is a machine built to a high standard, capable of accurate work and very easy to set up and use. **GW**

## SPECIFICATION

<b>MOTOR</b>	1800W	
<b>BLADE DIAMETER</b>	254mm	
<b>NO-LOAD SPEED</b>	2500rpm	
<b>MAX MITRE RANGE</b>	-45° to + 60°	
<b>MAX BEVEL RANGE</b>	50° left	
<b>MAX CUTTING CAPACITY</b>	at 90°	305 x 75mm
	at 90° x 45°	305 x 45mm
	at 45° x 90°	210 x 75mm
	at 45° x 45°	210 x 45mm
<b>WEIGHT</b>	17.4kg	

## VERDICT

This is a machine of excellent quality, designed to perform to a high standard of accuracy combined with ease of use.

**PROS**

- Easy to set up and use
- Accurate performance
- Switchable laser

**CONS** ■ Bevel cuts can be made to the left only

**VALUE FOR MONEY**

**PERFORMANCE**

## FURTHER INFORMATION

- NMA Agencies
- 01484 400488
- [www.nmatools.co.uk](http://www.nmatools.co.uk)

Placing some scrap timber against the fence allows full trenches to be cut



The laser is battery-powered, and can be switched off when it's not needed



There was no problem with crosscutting at the maximum width of 305mm



The saw head can be tilted by up to 50° to the left only for making bevel cuts

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**27th Feb | 28th Feb | 1st March 2015**  
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Many power sanders feature dust collection, but hand sanding can also produce a lot of dust. Mirka has come up with a clever way of extracting it at source

# Mirka Handy sanding kit

Hand sanding even a modestly-sized job produces a surprising amount of dust, so when Mirka asked me to test the latest addition to their well-known range of extracted sanding kit I willingly agreed.

I tried out the Mirka Handy – primarily a decorator's tool – and alongside it the smaller 125 x 70mm grey sanding block. Both apply the principles of power extraction to a hand-held block. The real genius, however, is the abrasive itself. Abranet, as its name implies, has a net backing and Mirka claims that no dust particle is ever more than 0.5mm away from an extraction vent.

### Cost factors

The Handy starter kit can be found on the web for around £36. Assembling a similar kit for the grey block, with 50 each of three grades of abrasive, would cost £44.74 from Axminster. Comparing costs with the equivalent traditional kit is difficult; although the abrasive is obviously more expensive to buy, it's likely to last a lot longer than any

conventional abrasive sheets – and the entire sheet is used with nothing wrapped around the block.

### Using the sander

Sized for larger surfaces and a two-handed grip, the well-named Handy is extremely comfortable to hold, while the smaller one-handed block is much more suitable for a furniture or box maker.

Both can be connected to the same flexible hose, and incorporate a regulator valve to control suction.

On using both pads, I was immediately impressed by the complete absence of visible dust. The Abranet abrasive also seemed to cut more efficiently, producing a finer surface more quickly than normal sheet abrasives, which I attributed to the lack of trapped dust between the sheet and the work. Working down through the grades was simple, as the sheets just peeled off the Velcro-style backing pad.

A lot of my work features dovetails in contrasting timbers, and sometimes the



Both pads use a hook-and-loop system to attach the sanding sheets

paler tails can become ingrained with dust from the dark pins, spoiling the effect. With this kit all the dust was instantly removed, leaving a very crisp appearance.

Of course it won't do everything. There are some situations, like sanding intricate corners, where a piece of folded paper held in the hand is really the only practical option. But for sanding flat areas the benefits are very clear. **MF**

### WHAT'S IN THE KIT

- 230 x 80mm hand block
- Hose and vacuum adapter
- Pack of 5 abrasive sheets (1 x P80, 3 x P120 & 1 x P180)

### VERDICT

This is a very effective system for improving not only the working environment but the surface finish when hand sanding.

- PROS**
- Excellent finish
  - Efficient extraction
  - No staining of paler surfaces when sanding contrasting timbers

- CONS**
- Initial set-up costs
  - Noise from the shop vac when sanding

**VALUE FOR MONEY**

**PERFORMANCE**

### FURTHER INFORMATION

- Mirka (UK) Ltd
- 01908 375533
- www.mirka.com



Suction holes in the Handy (top) and in the grey block (above) provide good extraction



The smaller grey sanding block is designed primarily for one-handed use



It's comfortable to hold, and just the right size for boxmaking

These two cordless jigsaws from Makita share the same internal workings but offer a choice of body style, with one featuring a standard D handle and the other the body-grip alternative. They're priced the same

# Makita DJV181 & DJV182 jigsaws



**£190**  
(body only)



**£459**  
(complete)

A good quality professional jigsaw is an extremely worthwhile investment. Though expensive, it will save you a considerable amount of time due to its remarkable versatility and its easy and convenient mode of operation. These two Makita saws incorporate all the latest cordless technology, with sophisticated brushless motors and fast-charging high-capacity batteries. The build quality is first class, and considerable thought has gone into making these tools as safe as possible.

### Design features

The saws are fitted with heavy alloy bases with detachable plastic protective covers. The bases can be tilted to the left or right for bevel cutting, and a hex key is stored in the rear for this purpose. There is the standard four-position orbital action switch that controls

the movement of the blade to increase cutting speed or improve the quality of cut. There is a tool-free blade changing system controlled by a single lever at the front of the machine. When activated the blade is ejected from the holder, so there is no need to touch it – a useful feature, as blades can become very hot in use.

Both machines are supplied with a rather neat dust extraction tube that fixes on to the baseplate and can be connected to a vacuum to remove most of the mess.

### Control choices

The two models differ slightly in their controls. Each has a safety button which must be pressed before the machine can be operated. This activates the two bright LED work lights that shine down onto the cutting point. Then the power switch can be pressed on the



The safety and power buttons are located at the front on the body-grip model...



...while the speed control wheel is at the rear, just above the battery



On the D-handled model the speed control is located just below the handle



The body-grip model is ideal for making awkward inverted cuts



The conventional D-handled model is easy to control for regular cuts

body-grip model, or the trigger squeezed on the D-handled model. The variable speed adjustment wheel is readily accessible at the rear of both machines.

### Using the saws

As you might expect, the performance of these saws is impressive. They are powerful and accurate. Both of them have a unique 'idling' mode. This means that when they are switched on initially they run at a slow speed, irrespective of the setting on the speed control. The moment the motor detects that it's under load, as the blade touches the workpiece, the motor comes up to full speed.

### Summing up

This is an excellent pair of saws that should please the most demanding user. There is little to criticise. I would have liked a variable speed trigger on the D-handled model, and perhaps the power buttons could be a little easier to reach on the body-grip model, though it does have them on both sides of the saw body to suit left- and right-handed users equally. Still, these are minor quibbles. Overall these are first-class tools, and with their advanced brushless motors they should have a long life whether in the workshop or out on site. **AS**

## SPECIFICATION

<b>BATTERY</b>	18V 4.0Ah Li-ion	
<b>NO-LOAD SPEED</b>	800-3500spm	
<b>MAX DEPTH OF CUT</b>	wood	135mm
	aluminium	20mm
	steel	10mm
<b>STROKE LENGTH</b>	26mm	
<b>BASEPLATE TILT</b>	0-45° left and right	
<b>WEIGHT</b>	2.5kg	
<b>ACCESSORIES</b>	two batteries, charger, carry case	

## VERDICT

These are two very accomplished tools. Their sophisticated design, coupled with very powerful lightweight batteries, make them hard to beat.


**PROS**

- Great performance
- Fast charging (36 minutes)

**CONS**

- No variable speed trigger on D-handle model
- Power button hard to reach on body-grip model

**VALUE FOR MONEY** 

**PERFORMANCE** 

## FURTHER INFORMATION

- Makita
- 01908 211678
- [www.makitauk.com](http://www.makitauk.com)



Both models feature a standard four-position orbital action selector switch



The saws are supplied with a rather neat – and efficient – clip-on dust extraction tube



The tool-free blade changing system is controlled by a single lever

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# In your own write...

Here are just a few of the latest letters we've received since the last issue. Drop us a line on paper or via screen and keyboard to add your voice to the woodworking crowd; you might be one of the lucky few who will manage to get their hands on a coveted *Woodworker* badge!

## SNAIL MAIL OR EMAIL?

You can write to us at The Woodworker, MyTime Media Ltd, Enterprise House, Enterprise Way, Edenbridge, Kent, TN8 6HF or send an email to [mark.cass@mytimemedia.com](mailto:mark.cass@mytimemedia.com)



A view with a room: looking up the road from Bill's workshop

## WORKSHOP LEGACY

Dear Mark

Not long ago you published a letter from Mick Cahill about how best to dispose of his tools. That letter, and your response, has inspired me to write and tell you of my own legacy.

I live in Crete, supported by my loving wife and many friends, and was recently diagnosed with a terminal illness. Having built my workshop and kitted it out over the last 14 years, my aim now is to transport the entire contents to England for the use of an organization that will teach people not just how to use tools, but what tools are about – the wonderful history of their development, and how restoring old tools can educate people into a different way of looking at the everyday work we do. It certainly did that for me.

Can you help me with my proposed legacy? Of course all costs would be down to us.

Sincerely

**Bill Smithies**

*Phew! Well, Bill, it sounds as though you've got your mind made up about this. All I can do is to sympathise with your situation and hope that, between me and our readers, we can come up with a suggestion that will work for everyone. In the meantime,*

*I wish you as well as can be.*

*Mark*

## TAKING MY TURN

Hi Mark

Although my main interest is in woodturning, I very much enjoy reading the rest of the magazine. In particular, I could read articles by Keith Smith until the cows come home. It doesn't matter what his particular project is; even though I will never attempt whatever he is writing about, he always makes the subject interesting.

In the August 2014 issue of the magazine, Ian Wilkie demonstrated the making of a merry-go-round. I've attached a photo of the one I created, inspired by his article. I did start out with the intention of copying his design, but I always find it difficult keeping to the plan!

Rather than using ribbons to make it revolve, this one is on a Lazy Susan turntable. It has been made for my newest grandson, who is due to arrive very soon. Currently I'm working on a toy tea set for my granddaughter's first birthday. Again this started out as a copy, but is changing at every turn (groan).

Kind regards

**Bobbie Phillips**



*Nice work, Bobbie. I particularly like the different hats. Personally I'm all for a bit of individual interpretation when it comes to making something. We all like to give a project that personal touch, don't we? Keep it up!*

**Mark**

## SCOOTER SAFETY

Hi Mark

January was a good issue. I especially liked your cabinet and Michael's box, and I always enjoy pieces by Keith Smith.

Ian Wilkie's scooter reminds me of one I made about 20 years ago. However, I have a suggestion about its safety. Having pierced wheels of the design shown introduces a shear hazard that puts fingers at risk as a hole passes the fixed edges of the chassis. If a child puts a finger through a hole for any reason – and they do – when the scooter is moving, a fracture could be possible. In machine design we look carefully for close-proximity components such as these that can act like scissors, chopping rather than breaking.

I haven't looked at the European standard EN71, or the British Standard for toy safety based on it, but it's likely they include mechanical hazards caused by rotating components. The easy solution is to drill stopped holes in the outer face of the wheels. That would allow the spoked appearance without the risk.

Kind regards

**Geoffrey Laycock** The Otter Consultancy: Ergonomics, Safety & Occupational Health

Hi Geoffrey,

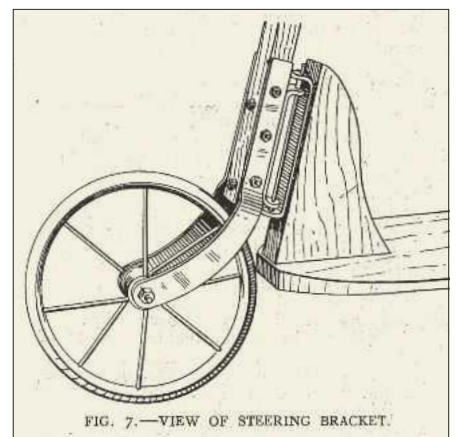
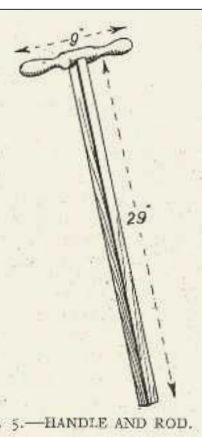
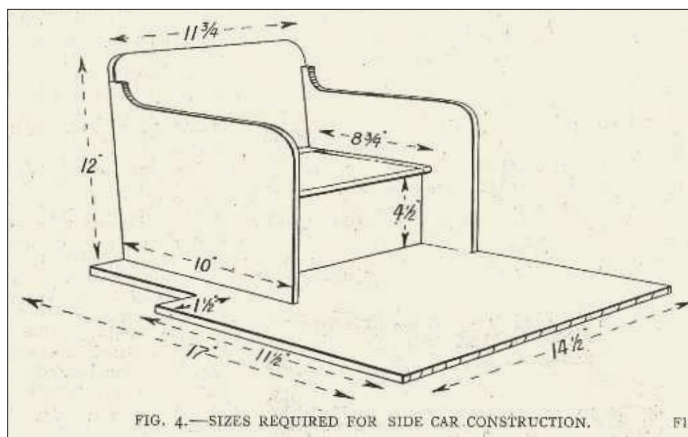
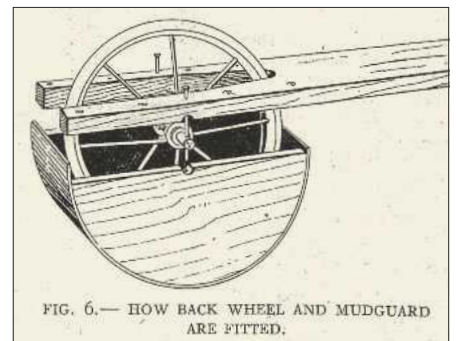
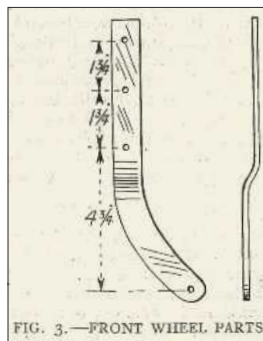
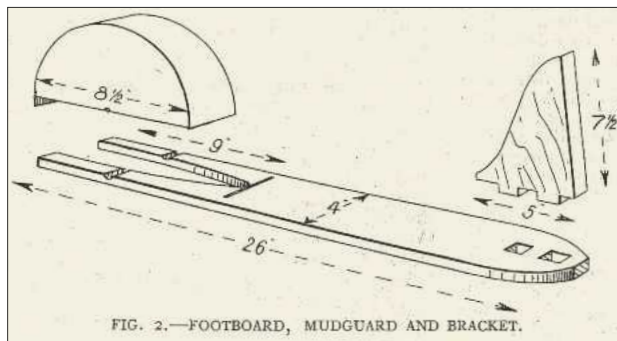
*Many thanks for that warning. I must admit I didn't consider that possibility; Ian is such a careful and professional maker that I've never had cause to doubt him. He was quick to acknowledge the potential problem and will take steps to avoid anything similar in the future. Yours is a very good solution, by the way; it's great that our readers are so on the ball!*

**Mark**



# A variation on the ubiquitous scooter

Many of us will have had a close brush with a wheeled vehicle on the pavement at some time or other. If you're expecting one, your best hope is that it's a small child on a plastic scooter and not something like this behemoth...



If there's one accusation you can't throw at the average woodworker of the 1920s, it's that of being unambitious. As a kid I used to plan and design all manner of go-karts and the like, but I would never have considered making my own scooter. There was something about the steering and front axle that seemed like a job too far for the barely skilled. Nowadays I (and I suspect the majority of our readers) wouldn't bat an eyelid.

## Round and round

Step 1 was to source your wheels. With limited access to many manufactured items 90 years ago, it was the norm for people to make their own stuff, and one or two magazines of note ably assisted them in their work. However, this was less of a

problem than you might think back then; wheels of all types and sizes were readily available from a number of specialist outlets. So, after a trip to town (or a small postal order and a short wait), work could begin.

## A bit on the side

At first glance this seems like a fairly straightforward job, or at least it would have been if some bright spark hadn't complicated things by adding a sidecar. With a bit of skill in the metalworking department, the scooter itself looks readily makeable and just about viable as a means of transport. Why then the sidecar?

I can't see its sizeable bulk – let alone the weight of the passenger – adding anything to ride quality. But it gets worse; without some kind of back axle differential, cornering

would have been very tricky, so a crude rod, pins and eyes arrangement was suggested. This was to link the sidecar to the scooter proper, and rates very high on the Heath Robinson scale.

## Health and safety

Despite shortcomings, I'd like to think that a few at least of these scooters were made, and maybe even ridden a block or two without incident! But if you're an ambitious type, and thinking of making one, please take my advice and leave off the sidecar...

*Mark*

More from The Woodworker archive next month...

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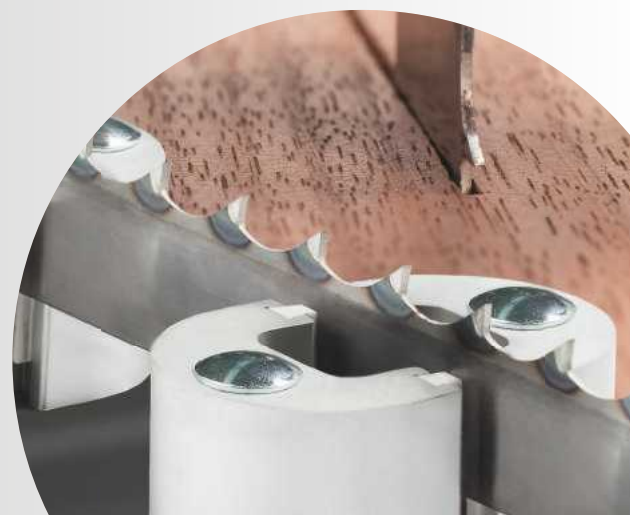
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