BAILEY'S ROUTER CLASS

Turning with your router

Mr Bailey makes Christmas candlesticks with a jig

THE PROJECT

With thoughts firmly turned to Christmas and the festive season, I reasoned that a turned candlestick would make a lovely project – with a twist, so to speak. Why not turn it with a router instead of the lathe? It's been done before and you can spend plenty of money on a purpose-built router lathe, believe it or not, but how about making your own? So, for my own fun and satisfaction and hopefully yours too, here is my own basic interpretation of a router lathe. On a proprietary model, the slide movement can be linked to the rotation of the blank to produce spirals and barleytwists. It would be possible, I suspect, to use simple gearing to do the same here, although I wasn't going for that level of sophistication. However, you can do separate slide and rotary motions and plunge cuts around a cylindrical shape. Once the bases were added, some quite pleasing results were created. By setting one of the centres of the jig at a different height, we even create a tapered shape! Please note – the candlesticks have metal inserts for safety.

The router is still the most versatile power tool there is. Along with a vast range of cutters, jigs and gadgets – many of which you can also make for yourself – it can help produce high-quality woodwork.

This series is intended to show you what the router can do, while assuming the reader has a general level of woodworking knowledge.

We hope to show you the aspects of each project that specifically involve the router and how this great bit of kit can expand your woodworking skills.

Each month we will highlight the jigs, cutters and gadgets you will need to help you get more from this incredible machine. Feel free to send us pictures of your routing endeavours, or post them on the WPP forum at: **www.woodworkersinstitute.com**

PHOTOGRAPHS BY GMC/ANTHONY BAILEY

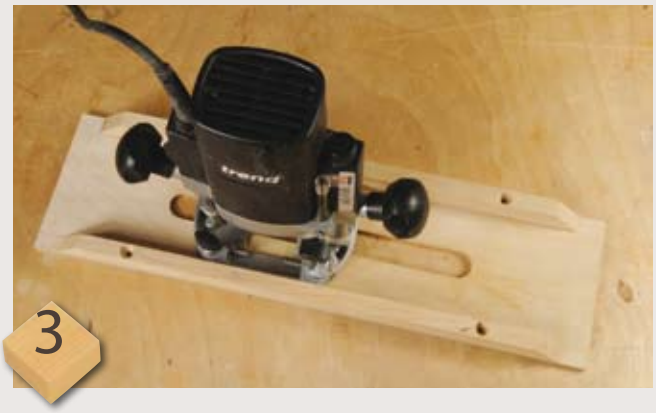
THE JIG

1

The finished jig with router and cutter mounted – the result is actually quite versatile and fun to use

2

The base parts are cut to suit the size of candlestick required. You can vary this to suit your needs, but you do need to fit square blanks of roughly the same length each time. Ours was really an experiment so we weren't over ambitious first time around. Each upright has an 8mm slot to accommodate the M8 bolts which hold the blank in place



3

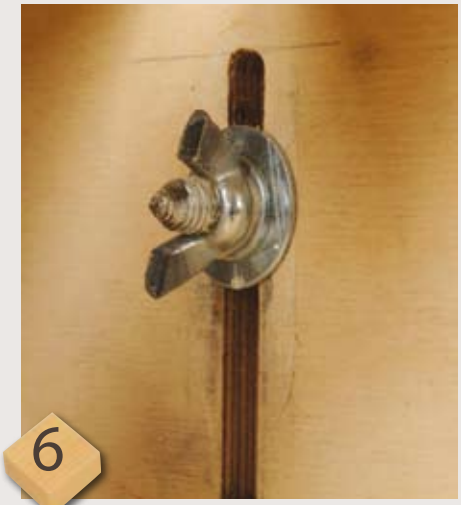
The top has two strips of wood to keep the router accurately on track each time a stroke or cut is made. Down the middle is a wide slot to accommodate the largest cutter you might use. This slot can be done once the track is screwed onto the uprights of the router lathe

4

The principle is simple but needs a little working out. The blank to be turned is held between bolts with points ground on the ends to act as turning centres. Nuts and wingnuts with washers hold each bolt firmly in position at the desired height in the vertical slots

5

The long eyebolt allows you to mount blanks of varying lengths. You can use a rod or screwdriver blade to turn it to push the point into a hole in the blank before tightening the nut inside and the wingnut outside



6

At the other end, a special nut and bolt set-up with a sharpened wingnut to act as a centring prong, holds the other end of the blank. Once the bolt is fitted and the wingnut done up, threadlock compound is used to fix the wingnut so it cannot come undone

7

On the outside is a circular ply plate, which acts as a means of indexing so you can make repeat equidistant slots with a pin locating the plate at each index position. It has a hole in the middle for the knob and bolt to fit tightly in, glued in place. The registration pin (2.5mm drill bit!) fits through into a thin ply sliding plate behind, with a red mark to show where the registration hole is in the plate

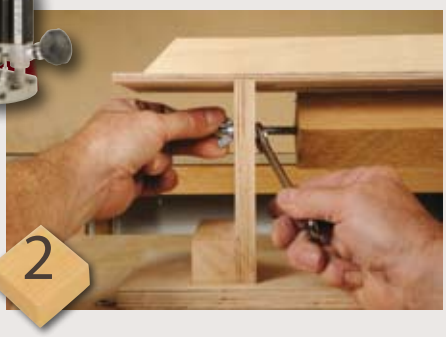
THE CUTTERS

From left to right: small tenon cutter and a three-wing bottom trimming cutter – either can be used to round off the square blank, although the three wing cutter gives a better result; two large corebox cutter for creating a swept base effect and two smaller ones for fluting; V-cutter for fluting and a face mould and point mould cutter, again for lengthwise detailing of the rounded blank. There are other variations on these types available that will also work well.

MAKING IT...

1

Cut and mount a suitable size square section blank. If necessary, make it overlength to fit your routerlathe and remove waste length later, or machine two components back to back. Mark the centre on each end and drill a small hole to mount the blank accurately



2

The eyebolt needs to be slackened off so you can fit the blank in between centres. Push it on to the wingnut and point at the right-hand end, and then turn the eyebolt until it presses firmly into the blank. Now tighten the nut inside and the wingnut outside until it is tight. Ensure the blank is as high up as possible and still able to rotate. Use a spanner or pliers to ensure tightness of the nuts. Push the other end of the blank up or down until the axis is level at both ends. We found the action stiff enough not to need clamps to stop the sliding plate from slipping down

3

Rest the trimming cutter on a high point of the blank, set the plunge rod for several millimetres, plunge and slide the router along –it should have the effect of removing the arris (the corner). Stop before you reach the end of the jig! Repeat this process on all the edges

4

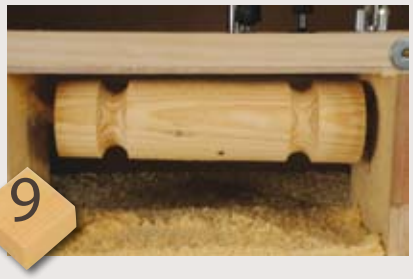
Do more passes in this fashion, plunging deeper each time, until the blank is fully rounded. Only take light cuts, however. You will need to keep sliding the router, turning the blank between each sliding motion to achieve a proper cylinder with an even surface

5

Do another full rotation of the cylinder in small turns to get rid of any remaining ridges. You should have a fairly even shape that can be improved by sanding. The next step in experimentation and control is to fit stop blocks to limit router travel and thus the limit of the cut

Bailey's Router Class

If you have successfully produced a cylinder, you are now ready to decorate it. A starting point would be to use a small diameter corebox cutter to flute it like a classical column. The cylinder will be smaller than the original blank, so raise the turning centres higher. Fit the corebox cutter and sit the router and sub base on the jig top. Rest the tip of the cutter on it and set the plunge depth using the depth rod and stage turret. Do not set too deep a plunge – you can make a second deeper pass if necessary. Now decide where to start and stop the cut and fit stops on the jig top to limit the router traverse accordingly. Use the index pin to fix the workpiece in a set position



Having made your first 'routered' turning, it is time to try something more advanced. This time we will form a flared shape. First, create a larger diameter cylinder than before. Then use a large corebox cutter to create the flare. Fix the router with stops and plunge in more than one pass and turn the registration knob to create a cove 'ring'. We tried two different depths to see which would look best

Use the bottom trimming cutter to remove the bulk in between using the stops clamped in place, so the cut won't spoil the cove shapes. Lastly, use a point mould cutter to create deeper fluting than before. Now, use the router fixed between stops and use the tip of the point mould to create a ring around the flared base

Withdraw the index pin and choose the next index space you want to use. The eight spaces on the index disc shown here, seem to work well. Machine the next flute and so on until the entire job is done

When you have successfully fluted the entire cylinder, remove it from the jig and sand it to remove all defects, including sanding in the flutes, using folded abrasive paper

Note – this jig and machine generates a lot of dust. We mitigated this by using a piece of clear polycarbonate in front, held loosely by big washers and screws (the screen was removed for photographic clarity during photography). This held back most dust, but needed clearing regularly! As well as the screen, you could have a pipe from a drum extractor fitted to the back of the jig, pulling sawdust away from you, which will stop the need to clear the screen of dust. ■

Router torque

Email your router questions to: anthonyb@thegmcgroup.com

Q I sometimes need to machine small square components but it seems incredibly dangerous on the router table, any ideas please?

A We faced the very same problem with creating bases for the candlesticks in this project. It isn't worth taking unnecessary risks with fast moving cutters. The simple solution we used involved cutting a piece of board square and taking out a section exactly the same size as the components that needed moulding. Next, a 'through fence' was clipped to the router table fence and a 'breakthrough' cut made to give proper support. The moulding was done on the end grain of each block first, then the long grain in several passes to final depth, thus avoiding deep, risky cuts. The block is now supported on all sides and cannot wriggle as it moves over the cutter. Keep your fingers off to the side of the cutter of course.

Using a supporting piece to help cut small components on the router table