Making marking gauges

You can gauge the success of your work by the marking tools you use. By Michael T Collins

Let's face it – marking gauges are not flashy, cost very little and, after the piece of furniture is produced, there is little evidence or much thought given to what part the marking tools played in its production.

But in my opinion, one of the most important tools used by woodworkers, and the one that I reach for in most of my projects, is the humble marking gauge.

Gauges come in all types, cost, shapes and sizes: the cutting gauge, mortise gauge, panel gauge and marking gauge. But, regardless of the type, they are an essential tool in the hand of a woodworker. In my experience, after the initial dimensioning, little of my work is actually measured. Instead, I gauge dimensions and joinery more often than not off the work itself. A marking gauge precisely locates the baseline of dovetails, the location of a mortise. And, as we have seen in previous articles (issue 42 pg.49) a gauge will ensure that multiple boards can be planed to the same thickness.

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PHOTOGRAPHS BY MICHAEL T COLLINS

I often think about the skilled hands the gauge has passed through and whether the tool has been imbued with those historic skills and what amazing items it helped make. Hoping that some of that skill will transfer to me.

In this article, I will show you how to make two simple gauges, a cutting gauge and a marking gauge, followed by a short tutorial on their use.

Wood selection

Any hardwood will work and this project lends itself to using scraps. For my gauges, I'll be using a few scraps of walnut and maple from a recent project.

The dimensions of the gauges are not fixed and are a personal choice, but make the body of the guide so that it feels comfortable in your hand.

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1 Over the years I have accumulated several gauges, but perhaps my most used is the one I bought from Colonial Williamsburg in West Virginia.

2 Having selected the wood, plane the faces. Then mark the face and edge side.

3 It is traditional for woodworkers to set dimensions based on the sizes of chisels that they own. To this end, I laid out the handle mortise with a 19mm chisel and then deeply marked the boundary with a marking knife. Do this on both sides, measuring from the face edge.

4 Create a through mortise by chopping out the waste from both sides, in exactly the same way that you would any other mortise – start about 1mm from one end with the bevel facing the direction of travel, chop and advance the chisel, stop about 1mm from the end and about-face and work back, clearing out the waste as you go.

Turn the wood over and repeat the chopping process.

An alternative method is to drill out the bulk of the waste and then clean up the hole with a chisel – the choice is yours.

5 As the mortise is going to have a handle pass through it is important to make sure that the inside faces of the mortise are perfectly smooth and parallel. It's OK to have slightly undercut mortise walls, this would allow only the outer edges to touch the handle.

6 Plane a piece of 300mm wood, which will form the handle, so that it fits the width of the mortise.

7 Next, rip the piece of wood so that it is about 22mm x 19mm.

8 Traditionally the underside of the handle has a slightly curved profile. This allows the gauge to be rotated and drawn across the wood surface. To create this curve I used a washer and then….

9 ...simply marked the length of the mortise on both sides of the handle and carry those lines down the length of the handle. By planing down to these lines a gentle curve is created. Alternatively, if you have a half-round moulding plane use that.

10 Check the fit, if necessary, plane or sand to size. The handle should move – with a little resistance – its full length through the fence's mortise. ➤

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11 I am making two gauges and no matter how accurate I am they are going to be a unique fit, so I marked the respective mating parts.

The cutting gauge locking mechanism

The next step is to make the locking mechanism. There are any number of ways to lock the gauge fence in place, from a simple screw driven through the body into the handle, to the more elaborate cam lever. But for the cutting gauge let's look at a traditional wedge lock.

12 First, decide the location of the wedge. The underside of the fence is not an option as it would interfere with the fence and the workpiece. My personal preference is to locate the wedge on the top. If I made a general purpose cutting gauge, the side facing away would be the better option as it would allow marks to be made right up to the fence. With the wedge on top, the closest setting will be about 12mm, which is plenty for most joinery.

For the wedge, I have found an 8°-10° slope offers the best combination of holding power and ease of unlocking. Any steeper and the wedge will slide in use and any shallower and it will be too hard to release. Mark out the slope using a 6mm chisel.

Because of my chosen location, I am chopping with the chisel parallel to grain, so to prevent 'blowout' I used a narrow saw blade to cut the slope angle across the fibres.

13 Then pare the waste away.

14 Next, using a bevel gauge, measure the slope angle, and…

15 …transfer this to the wedge stock – don't worry about the height of the wedge at this point, this will be adjusted later. At this stage, you can embellish the wedge. In the image I used a washer to create a stop.

16 Mark the depth of the wedge when it is in the slope in the unlocked position. Draw a line and plane to this depth.

17 For small fiddly pieces, I find that clamping a block plane in the vice is the easiest way to work, just be careful of that blade.


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Test-fit the wedge. Once it seats correctly and the long edge is parallel and flush with the mortise, insert the handle and test the locking ability – it should hold snugly when locked, but not so tight that it is hard to unlock. If the fit is too tight lightly sand the sides of the handle.

From the images, you can see that I gave the fence a more stylish design by sawing off the top corners.

The cutter

Traditionally woodworkers would have made the blade with whatever they had to hand. I have a bucket of scrap metal, saw blades, brackets etc. (Yes, I know I'm a woodworker but these things just happen…)

18 Saw steel is the ideal metal for all sorts of woodworking tools, from scrapers to marking blades. The first thing to do is to cut a length of hacksaw blade. Hacksaw blades are case hardened and therefore almost impossible to cut – but heating the blade (annealing it) for a few minutes will make it quite malleable and easier to cut.

The heating process changes the molecular structure of the metal, allowing you to shape the piece of metal. Cut the piece so that it is approximately 6mm x 40mm, then file a double edge on one end.

19 Next, using a file, refine the edge of the blade to a knifepoint.

20 With a series of grits and a figure-of-eight motion hone the edge.

21 Without delving deep into the properties of metallurgy, the metal needs to be reheated to temper it so that it reverts back to its pre-annealed state of hardness.

Heat the blade slowly and then allow it to cool. When you see the surface of the metal start to change to a dark straw colour – about 230° C – quench the blade in water.

Many years ago, while at secondary school, I did metalwork and Mr Parfitt, my metalwork teacher, would always yell "Collins, wait 'till you see the straw colour!"

Clean off any oxidization and give it a couple of swipes across a honing stone.

You now have a very small knife blade.


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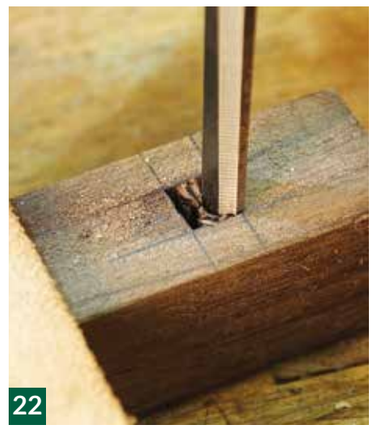
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Creating the mortise for the cutter

22 The mortise is 6mm square on the topside and 3mm x 6mm on the underside – this allows for a wedge to hold the blade in place. Chop the mortise but make sure that the sloping wall is the one farthest from the fence. This will make sure that the cutter is forced vertically towards the fence.

23 The wedge is a piece of brass fashioned by filing into a wedge that fits snugly in the mortise. Leave it so that about 6mm protrudes from the top and 4mm out the bottom. A wooden wedge would work just as well.

Position the cutter in the mortise so that approximately 6mm of the blade protrudes out the underside. Then wedge into place. ➤


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The marking gauge

24 The marking gauge fence and handle are made using exactly the same techniques, but instead of having a wedge to hold the handle in place, I used a brass threaded insert and a thumb screw.

25 The pin is nothing more than a panel pin driven through a hole with a slightly smaller diameter, leave about 6mm of nail showing on the underside. File the nail smooth – it isn't necessary for it to be super sharp.

26 I created a curved profile on the upper and lower edge of the fence.

Using a gauge

27 A cutting gauge is used to slice fibres perpendicular to the grain, such as when laying out the baseline for dovetails. Hold it firm against the edge, pushing towards the wood. I generally pull the gauge towards me.

For me, one of the major advantages of a wedge lock is that they are very easy to set. I hold the gauge with my thumb and index finger around the fence, with the remaining fingers holding the handle. Holding it this way allows me to lock, unlock and adjust the gauge with one hand.

Setting the gauge

Adjust the gauge so that it is about 2-3mm under the required setting. Tap the wedge on the side of the bench to lock it. To get the exact setting tap the bottom of the gauge handle (the end without the cutter) on your bench top this will move the fence away and at the same time tighten the wedge. Repeat until you have the setting you are looking for. If you go too far, start again, as hitting the top of the gauge will loosen the fence.

28 A marking gauge is generally used to mark wood in the direction of the grain. Again, hold it firm against the face edge

29 Angle the gauge towards the direction of travel. Make several light strokes – if you dig too deep

initially, it is very easy to get caught in the wood's grain and go off track. Making several, increasingly heavier passes will prevent this.

And there you have it – two very practical, traditional and easy-to-make gauges that will serve you for many years to come. And who knows, in some years hence when a young woodworker handles your gauges they may wonder at the skills of the woodworker who made and used them… ■