

Treetop Mallets - Jeff Farrington

I started playing croquet many years ago but only found the time to take it up properly since leaving full time employment in 2010. It is an absorbing game involving both skill and tactics.

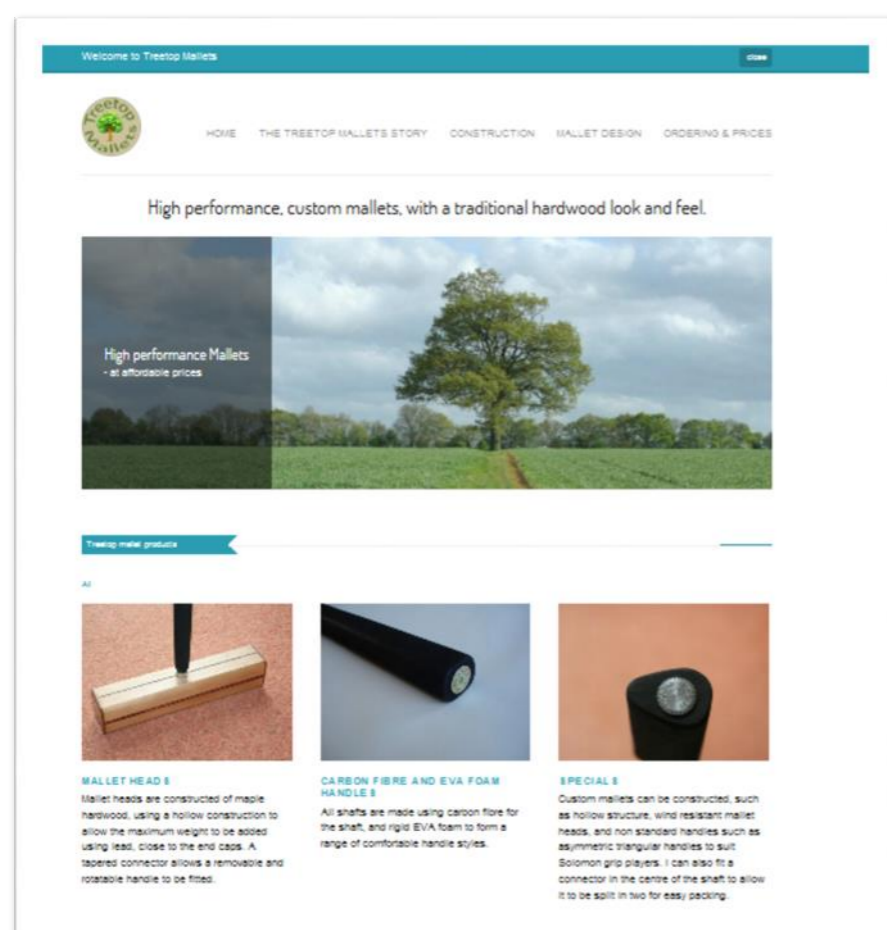
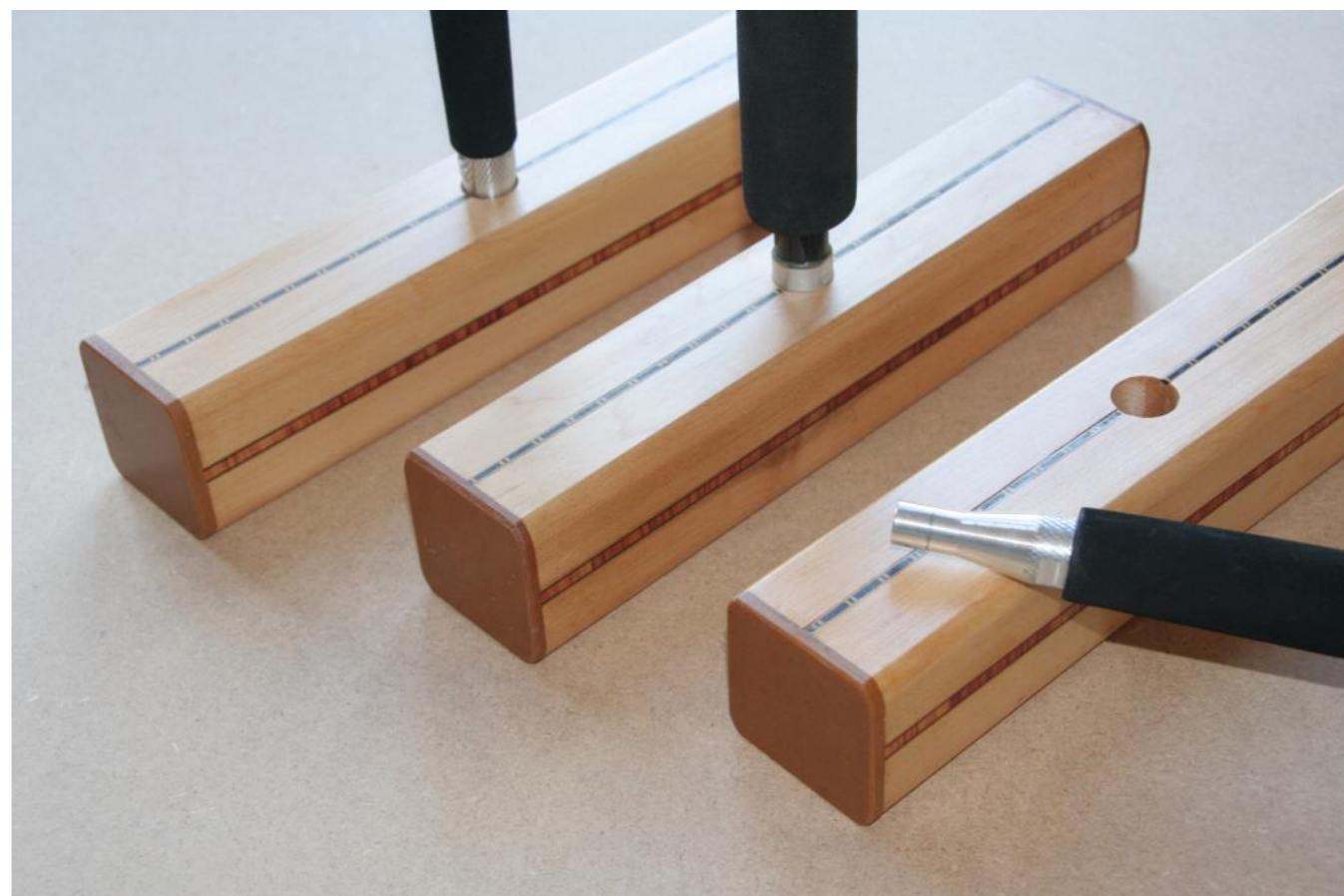
I needed a new mallet and set out to design a mallet with the traditional look and feel of a hardwood mallet, but with the performance of a modern peripherally weighted design. Commercially these are made using composite materials and metal. To use wood, I needed to reduce the mass by making it a hollow structure, and then add back the weight as close to the mallet end faces as I could manage.

After some experimentation I settled on a design using two clam shell components, made from maple, a tough and resilient hardwood, that finishes well, and seems to stand up to the knocks and scrapes of match-play. Each is hollowed out, so that when bonded back together it then forms a shell onto which weighted end caps can then be attached.

All my early mallets were hand routed, but to achieve more consistency, (and avoid a tedious job), I have built myself a computer controlled router to do the job for me. This is probably overkill for the number I make, but it was very satisfying.

My early handles were also wood, but that added weight away from the "business end" of the mallet and so I sought a lighter substitute. I found a solid foam that seems ideal as it can be worked like wood, but weighs only a few grammes, and is most comfortable to hold in wet and dry conditions.

Other people asked if I could make one for them, and having now supplied quite a few to my own club members, I decided in 2015 to set up a web site (www.treetop-mallets.co.uk) and sell mallets further afield as a hobby business.



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Construction

- The hollow structure for the head is routed out of two pieces of maple and can weigh as little as 250g.
- I then put an inlay of cross banded tulip wood into a routed groove where the top and bottom routed parts meet. Another cross banding inlay on the top adds the sight line.
- The end caps are made of Tufnol, a Phenol formaldehyde resin laminated with cotton fabric. It seems an appropriate material and dates back to the 1920s.
- The end caps are attached by being bonded in place with lead and resin. This adds mass just behind the end caps which creates a head weight of ~1kg. This maximizes the peripheral weighting, and hence the moment of inertia of the mallet around the shaft.
- I take particular care to ensure that the end faces are perpendicular to the sight lines, as this is the most critical dimension of a mallet. A 100mm ball at 10m represents an angular target of around 1/2 degree, so for the mallet to have no significant contribution to inaccuracy of aiming, the squareness needs to be significantly less than this. My criterion in manufacture is around 1/10 degree.
- A tapered hole in the centre then takes a turned component that allows a carbon fibre shaft to be attached to take the handle parts.
- I use carbon fibre for the shafts of all my mallets as it seems to offer many advantages, of lightness combined with stiffness, but provides enough flex to aid the player. I think that a slightly flexible shaft allows the maximum transfer of momentum into the struck ball, so reducing the effort needed, and reduced effort and strength allows most people to be more accurate. The shaft is bonded to the turned taper component that attaches to the head.
- The handles are then formed out of a solid ethylene-vinyl acetate (EVA) foam material, which can be worked using similar techniques to wood. This is then fitted to the shaft to complete the mallet.

