

The SHOCK of the OLD

Part 26: Lug Spars

Moray MacPhail adds carbon fibre spars to a design inspired by the single-handed sailors of the 1880s.



As I work on updating the rig on *May*, my own 15' (4.6m) Selway-Fisher Lillie canoe yawl, I often raid the website of Goat Island Skiff designer Michael Storer which has lots of information on setting up lug rigs – and unlike so much on the internet, opinions expressed there are well tempered by actual experience.

Since cheapskate MacPhail just bought some bargain windsurfer masts without really thinking about anything except the joy of not spending too much money, and given my experience with the mast as described in the last article, I ask with some trepidation: Just how stiff should the yard and boom be?

For guidance, there are my old wooden spars and a couple of tables comparing various versions of Goat Island Skiff yards and booms on the

Storer website. Generally the stiffness is estimated by hanging a 10kg weight from the middle of the yard and measuring the deflection. Reducing the answer to a ratio of deflection to length, the answers for yards seem to emerge as 0.5% to 1.3% – so for a 3m yard that is 15–40 mm deflection with a 10kg weight. For booms the ratio is 0.1–0.7% giving 3–20mm.

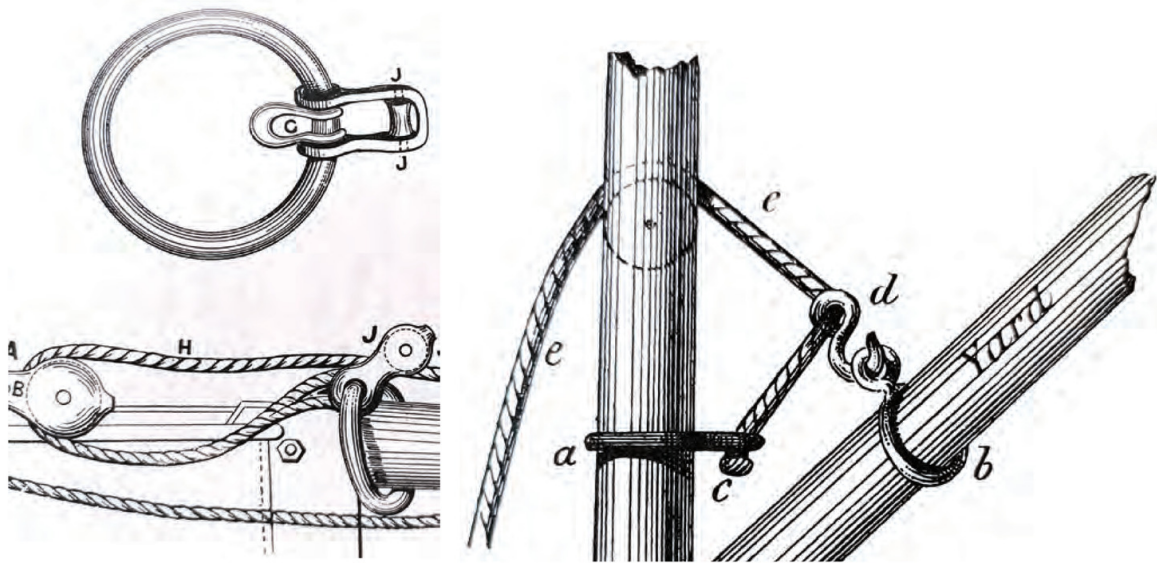
My wooden spars come out at 0.6% and 0.3% respectively, so pretty much in the right area. My new carbon ones are 0.4% and 0.5% – probably a bit stiff for the yard and perhaps on the flexible side for the boom but in neither case out of range and they save a good deal of weight – which is a relief, even though, as with masts, we know what they *are* but not necessarily what they *should* be.

I should point out that this is not

the same conclusion reached by Roy Downes in converting his National 18 to yawl rig some years back – there's a link to Roy's full article on the Dinghy Cruising Association (DCA) website at the end of this episode. He had made for himself a very stiff yard, and used the previously bendy version as a boom.

But there is a note of caution on the Storer website: *One extremely paradoxical result we have found is that a stiffer yard tends to create lee helm (this has) also been observed in the balance lugs of Lymington scows where stiffer spars and boom vangs (kickers) generally force the sail to be moved back to maintain balance. Experiments continue.*

That last comment highlights one aspect of this rig: the ability to shift the whole sail to get a good balance.



Above left: Traditional bowsprit traveller with loose stirrup and hook, not suitable as a mast traveller. Right: A Mersey Sailing Boat traveller; that ring would also jam on the mast. Below left: A mast traveller with rigid stirrup and hook on a parrel line patented by Mr Ferguson, a Greenock sailmaker. Below right: Modern small boat traveller made and sold by Classic Marine.

Indeed with enough string, you can adjust for different points of sailing as you are going along. But let's get to some practical details, starting with halyard arrangements.

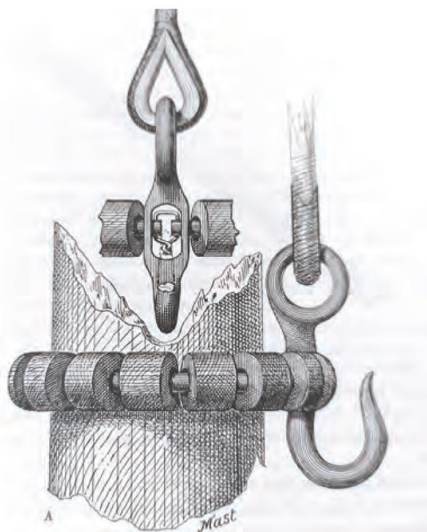
Typically the hoisting point is between a third and a half way along the yard. It is a good plan to keep the yard near to the mast while hoisting or reefing and this is often achieved by using a mast traveller.

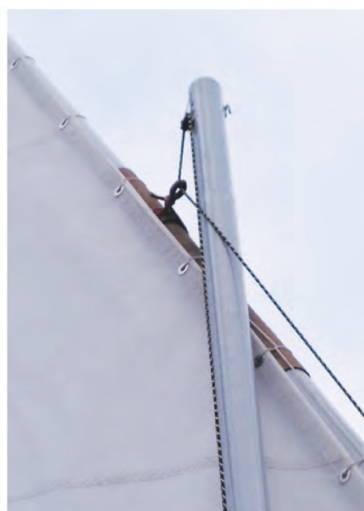
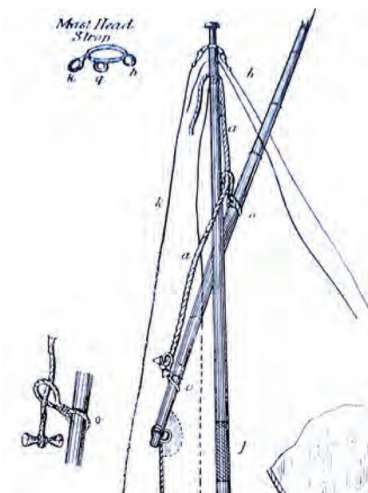
To quote from E F Knight's manual *Sailing* of 1889: *The sail is kept close to the mast and iron traveller; but*

if the sail be cut with a high peak it will be found that the traveller has a tendency to prevent the sail from lowering completely. A traveller is also liable to jam if the mast is not kept well greased

Traditionally, mast travellers were made to pretty much the same design as bowsprit travellers with loose stirrups and hooks and for large luggers they sometimes still are. For smaller craft, as Mr Knight says, jamming was often possible. But it is possible to improve on the design

by making the hook and stirrup rigid. My version at Classic Marine for sails up to about 160 square feet (15m²) recognises that the direction of the pull is fixed. So the key element, from the point of view of strength, is the hook. By making this into an S-shape and fixing it rigidly to a fairly light ring, you have a fitting which is strong where it needs to be and which keeps the ring at 90° to the mast when tension is on the halyard, which the old version often did not. Now that's progress for you and saves greasing the mast.





Above left: Baden-Powell halyard arrangement on his Nautilus canoes. Centre: Arrangement on my canoe yawl, part hoisted Right: Fully hoisted. Below left: Prussik loop arrangement. Centre: Loop part-wound on spar. Right: Loop tightened on spar.

But despite the fact that I have made more than 400 of these travellers over the past few decades, I'm off down a different route this time. Back to Mr Knight: *The iron traveller is dispensed with on most of the Upper Thames boats, and instead of it, a line is fastened to the yard, which passes round the mast and is rove through an eye on the yard. When the sail is up, this line is hauled taut, and prevents the yard from blowing away from the mast.*

This is the arrangement proposed by Michael Storer and shown above



courtesy of Baden-Powell in 1880 and some years later, on my boat *May*, you see it part and fully hoisted.

As for the halyard, at the forward end of the yard I pass the end of it through a hollow rivet – which also keeps the solid end plug in place – around the mast and through a thimble – home-made from acetal – to a block at the masthead. This then leads down through the deck collar to a turning block at the foot of the mast and a cleat on the plate case. This also serves to keep the mast in place. The halyard can be single part, because the luff tension is adjusted by the downhaul.

For attaching the thimble on the yard, a prussik loop provides

both a lightweight solution and the adjustment needed to get a good set of the sail – see the pictures below. This scheme is also used for downhaul and mainsheet attachments.

One thing everybody agrees on for this rig is the need for a powerful – even brutal! – tackle on the luff. This is achieved not so much by the halyard but by a downhaul, of which more next time when we'll look at the boom and its fittings. Having not really thought much about the potential of lug rig, I'm finding this whole process very interesting.

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