

Wooden car wheels

Some inventions have a longer useful period than others.

Once upon a time, a little before 900BC, a proto-Celt invented a new way of making wheels. The technique soon caught on and became a beautifully refined art. By and by other proto-Celts took to burying their dead in graves with their wagons, thus leaving evidence of their fine workmanship. The wheel made with an iron tyre had come to stay...play with the word 'tyre' and its synonym 'bond' and the central point of this invention is apparent, the iron hoop bound ['tied'] the parts of the wheel together, making a stronger construction than previous methods had given*. It was practical, strong and elegant, and remained in use until the Romans gave up running what I have heard referred to as their sordid empire.

And then it vanished, to reappear sometime in the 18th century. But it headed for a fall.



Figure 1 a damaged wheel, and a good one, from a 1902 Oldsmobile,

The other day, a wheel from a curved-dash Oldsmobile was brought in to the workshop, which graphically illustrated an unforeseen problem with the old design, a little misapplication of the clutch and, well, see the picture.

Torsional forces are not catered for in the Celtic scheme, and come a-plenty with the advent of engines and brakes. The Oldsmobile case involves a gearbox, a thing which brings complications well worth avoiding, including the need to apply clutches with care if the wheel design is inadequate. In the 19th century, for reasons connected with machine production and replacement of parts in 'the field' when they had perhaps been blown out by gunfire, a form known as the artillery wheel had been invented.



Figure 2, the hub of an artillery type car wheel

It provided a way of addressing some of the problems which the old design showed. The principal feature of the design is that the spokes are not mortised into a wooden stock, but come together at their roots as wedges, segments, and are sandwiched between a flange and a floating plate, bolts securing them. Early cars soon began to use artillery wheels, they take the loadings of braking pretty well, and sideways forces just as well as the old kind. And they look proper handsome when they are made nicely.



Figure 3 a set of completed wheels for a Sunbeam car

But there are snags, mostly to do with the nature of timber. It has a habit of exchanging water with the atmosphere, and this makes it shrink, swell, or sometimes crack. Like most engineered structures, if it starts to ‘work’ loose, the wheel can rapidly deteriorate and become dangerous, though to be fair, they usually give visual and audible warning before collapsing. So they must be kept tight, not too dry not too wet, a bit of a conflict when the rest of the vehicle would rather be very dry so corrosion is minimised. The mode of making them too has to take account of the nature of the tyre, likely to be a channel made to accept the beaded edge tyre...a ‘cover’, and that has to be a given size. Your old-fashioned wheelwright made his wheel and then cut the tyre [the iron tyre of the Celt] to fit, where would that leave the makers of pneumatics, which I believe Swedes call ‘gummibonds’? The new sort of wheel has to be exactly the right size, and it must also have the channel tyre fitted in a manner which doesn’t distort the steel, either of these points being omitted will lead to problems in fitting the rubber tyre. But the channel must also be the means by which the wheel is compressed into a firm strong structure. So the man who makes your wheels needs to think in a manner more modern than the Celt, less rustic than the country wheelwright of yore, and the tolerances he works with need to be about 50%...or perhaps that means 100%, I’ve heard so many economists lately that a strange confusion sets in....finer.

* the OED doesn’t help in supporting my supposition that the origin of the word ‘tyre’ in this use is that it ‘ties’ the wheel together, the Americans spell it tyer, the French use ‘bondage’ [no, you need to pronounce that ‘borndarge’ or it leads to misunderstandings]. It is used for the rim of a wheel at odd moments before the physical application of a continuous band apparently came back into use. But it still looks a good theory to me, though I claim absolutely no expertise as a philologist.