

## The first pneumatic tire was leather-covered and invented in 1845

Robert Thomson was on the right track, but in 1845 the market just wasn't there for his leather-covered pneumatic tire.



Robert W. Thomson (1822-1873)



Replicas of Thomson's original leather-covered carriage tire owned by the British Science Museum are among the last known examples of the earliest pneumatics. Tire at left is held together by rivets, which Thomson believed would also aid traction. Leather covering at right is laced together.

Robert W. Thomson was the first inventor of the pneumatic tire, having patented the concept on December 10, 1845.

Unfortunately, the inventor didn't live long enough to see the air-filled tire become a commercial success or witness its revolutionary impact on humanity.

Nevertheless, Thomson, a visionary with great expectations for the pneumatic tire, never lost faith in it despite the market's obvious lack of interest.

While the prolific young inventor was forced to shelve the pneumatic tire in favor of more lucrative projects such as steam power, he continued looking for ways to improve on his original patented design.

It's known that up until only three years prior to his death at the relatively young age of 50, Thomson was still searching for a more satisfactory air-tight tube for use in a pneumatic tire. Thus it's tempting to ponder how the course of tire history might have changed had he lived another dozen years or so.

Thomson was born on June 29, 1822, at Stonehaven, Scotland, where, in early years, his parents hoped he might one day become a member of the clergy. But young Thomson didn't take to classical studies. So at age 14 he was sent to Charleston, S.C. to be educated as a merchant.

However, this parental attempt to shape the youth's career was no more successful than the first. So, on returning home two years later, he was allowed

to embark on a course of self-education as a mechanical engineer – experimenting and working as an apprentice in shops in Aberdeen and Dundee, Scotland. This approach soon bore fruit.

Thomson, while still in his teens:

- Conceived the idea of the ribbon saw, his design being carried through to completion by other hands;
- Began development of a rotary steam engine, a project which was to occupy much of his attention in later years; and
- Designed a fully-functional fountain pen.

The young inventor also carried out experiments in chemistry and electricity with such enthusiasm his father was forced to move Thomson's operations to separate quarters where the not-infrequent explosions he caused would be less troublesome.

Soon after, the youth discovered a method of firing explosives by electricity, which earned him the commendation of the famous physicist Michael Faraday. On the strength of that invention, Thomson was given a job supervising more than 500 employees in blasting operations near Dover, England.

Thomson was only 23 when he invented the pneumatic tire, patenting it in France (1846) and the United States (1847) as well as his native England.

Remarkable, his wide-ranging patent application covered so many potential modifications and uses for the pneumatic tire that many a would-be inventor would later rue Thomson's farsightedness.

Among other things, Thomson foresaw the addition of metal studs to the tire's tread to improve traction and use of his "aerial wheels" on railway cars. He also envisioned multiple tubes or compartments inside the tire to maintain at least partial inflation should a puncture occur.

Moreover, it was Thomson who first proved the air-inflated tire could reduce the energy required to move a vehicle over anything less than a perfectly smooth road surface. His findings on this subject were made public on the pages of "Mechanics Magazine," August 22, 1846.

In carrying out these experiments, Thomson measured the power required to pull a horse-drawn wagon over the streets of London. He demonstrated that air-inflated tires can reduce tractive effort by 60% when rolling over a smooth surface and as much as 300% on rough roads when compared to the iron tires of his day.

Unfortunately for Thomson, the vehicles of that era were slow and heavy and only the horses pulling them cared about how much effort was required. The

buying public in general perceived no great need for the pneumatics' advantages – the bicycle not having come of age in 1845.

What's more, Thomson's leather-covered tire had the added disadvantage of not being readily detachable, requiring the user to loosen more than 70 security bolts to remove it. This was no small consideration for a tire which might easily be punctured and need repair.

Above all, the ambitious young Scot found the market of his day simply too meager to justify manufacturing pneumatic tires on a large enough scale to be commercially profitable. He was, after all, an inventor – not a philanthropist.

So Thomson put his pneumatic tire invention on the shelf – at least temporarily – in favor of more lucrative projects, particularly those involving heavy steam vehicles, for which he designed giant solid tires.

In 1868, 23 years after his pneumatic tire invention, Thomson was responsible for what were probably the first solid rubber tires used on such heavy vehicles

These were huge vulcanized rings of rubber, 12 inches wide by up to 5 inches in thickness and weighing hundreds of pounds. They were made for him by the North British Rubber Co. Thomson filed a patent on a solid tire of this type in 1867.