

Robert William Thomson



Robert William Thomson (baptised 26 July 1822-8 March 1873), from Stonehaven, Scotland, was the original inventor of the pneumatic tyre.

Biography

Born in Stonehaven, Kincardineshire, Robert was the eleventh of twelve children of a local woollen mill owner. His family wished him to study for the ministry but Robert refused, one reason being his inability to master Latin. He left school at the age of 14 and went to live with an uncle in Charleston, U.S., where he was apprenticed to a merchant. Two years later he returned home and taught himself chemistry, electricity and astronomy with the help of a local weaver who had a knowledge of mathematics.

Robert's father gave him a workshop, and by the time he was 17 years old he had rebuilt his mother's washing mangle so that the wet linen could be passed through the rollers in either direction, had successfully designed and built a ribbon saw, and had completed the first working model of his elliptic rotary steam engine which he was to perfect in later life. He served an engineering apprenticeship in Aberdeen and Dundee before joining a civil engineering company in Glasgow. He then went to work for an Edinburgh firm of civil engineers where he devised a new method of detonating explosive charges by the use of electricity, thus greatly reducing the loss of lives in mines throughout the world.

Thomson next worked as a railway engineer and supervised the blasting of chalk cliffs near Dover for the South Eastern Railway. Soon he set up his own railway consultancy business and proposed the line for the Eastern Counties Railway which was accepted by Parliament and eventually developed.

Thomson was only 23 years old when he patented his pneumatic tyre. He was granted a patent in France in 1846 and in the USA in 1847. His tyre consisted of a hollow belt of India-rubber inflated with air so that the wheels presented "a cushion of air to the ground, rail or track on which they run". This elastic belt of rubberised canvas was enclosed within a strong outer casing of leather which was bolted to the wheel. Thomson's "Aerial Wheels" were demonstrated in London's Regent Park in March 1847 and were fitted to several horse-drawn carriages, greatly improving the comfort of travel and reducing noise. One set ran for 1200 miles without sign of deterioration.

For many years Thomson was frustrated by the lack of thin rubber, and he turned to the development of his solid rubber tyres. It was not until 43 years later that the pneumatic tyre returned, when it was developed as a bicycle tyre by John Boyd Dunlop. Dunlop was granted a patent in 1888, but two years later was officially informed that it was invalid as Thomson's patent anticipated it.

At the Great Exhibition 1851, Thomson demonstrated his self-filling fountain pen and an invalid chair with solid rubber tyres. The following year he accepted a post in Java, where he designed new machinery for the production of sugar, thus greatly increasing profitability. During this time he invented the first portable steam crane but did not bother to patent it.

Thomson returned to Scotland in 1862. Despite ill health, which latterly confined him to a couch, Thomson's genius was undiminished, and some of his most significant work was done during the following ten years. In 1867 he patented a solid India-rubber tyre for his road steamers. *The Scotsman* described this application of vulcanised India-rubber to the wheels of road steamers as "the greatest step which had ever been made in the use of steam on common roads". The resilience of the stout rubber tyres allowed his lightweight five-ton steam engine to run on hard or soft, wet or dry surfaces, over obstacles, uphill or downhill. In addition, the thick rubber tyres did not damage the roads as did the iron wheels of heavy traction engines. Thomson's first road steamers, manufactured in his own small workshop in Leith, were fitted with three wheels, the small single wheel at the front being directly below the steering wheel. The tyres, which were 125 mm (5") thick, were corrugated internally and adhered to the wheel by friction.

Thomson's road steamers, often drawing four fully loaded coal wagons totalling 40 tons up and down steep gradients, excited great interest in the streets of Edinburgh. Soon the first omnibus was in service between Edinburgh and Leith. Engines were exported to Java, India, Canada and Australia, and by 1871 were being manufactured under licence in both the UK and the USA by companies such as Tennants of Leith, Charles Burrell in Thetford and Robey in Lincoln.

R. W. Thomson, the versatile genius, died at his home in Moray Place, Edinburgh, aged 50. His mind was active to the end, and his last patent application, for elastic belts, seats and cushions, was filed after his death by his wife, Clara. In 1922 the Royal Scottish Automobile Club presented the town of Stonehaven with a bronze plaque to

mark the centenary of Robert William Thomson's birth. This was placed on the building on the south side of Market Square which occupies the site of his birthplace.

Patents and developments

Pneumatic tyre (see US Patent 5104)
Writing and drawing instruments (the self-filling pen)
Improvements in obtaining and applying motive power
Dividing hard substances such as rock stone and coal
Steam boilers
Improvements in steam gauges
Steam omnibuses
Applying steam power in cultivating land
Elastic wheel tyres
Road steamers
Guiding road steamers on street tramways
Elastic belts, seats and other supports or cushions.

Thomson was also the originator of:

- The washing mangle with reversible mangles
- The ribbon saw
- Elliptical rotary engine

Robert Thomson (1822 - 1872)

Robert Thomson invented the pneumatic tyre in December 1845 and his memory is kept fresh annually by a vintage car rally held in June on the Market Square in the town centre directly opposite the site of the house where he was born. Robert was the eleventh of twelve children of a local woolen mill owner. His family wished him to study for the ministry but Robert refused, one reason being his inability to master Latin. He left school at the age of 14 and went to live with an uncle in Charleston, USA, where he was apprenticed to a merchant. Two years later he returned home and taught himself chemistry, electricity and astronomy with the help of a local weaver. Robert's father gave him a workshop and by the time he was 17 years old he had rebuilt his mother's tangle so that wet linen could be passed through the rollers in either direction, a ribbon saw, and had completed the first working model of his elliptic rotary steam engine.

He patented the pneumatic tyre in France in 1846 and in the USA in 1847. His tyre consisted of a hollow belt of India-rubber inflated with air so that the wheels presented "a cushion to the ground, rail or track on which they run". This elastic belt of rubberized canvas was enclosed within an outer casing of leather bolted to the wheel.

Thomson's "Aerial Wheels" were demonstrated in London's Regent Park in March 1847 and were fitted to several horse-drawn carriages. One set ran for 1200 miles without sign of deterioration. However, despite satisfactory testing the tyre developed no further at this time because the North British Rubber Company was unable to supply the strong thin rubber necessary for the inner tubes. For many years Thomson was frustrated by this lack of thin rubber and he turned to the development of his solid rubber tyres. It was not until 43 years later that the pneumatic tyre returned when it was developed as a bicycle tyre by John Boyd Dunlop. Dunlop was granted a patent in 1888 but two years later was officially informed that it was invalid as Thomson's patent had preceded it. At the Great Exhibition in 1851 Thomson demonstrated his self-filling fountain pen and an invalid chair with solid rubber tyres. The following year he accepted a post in Java, where he designed new machinery for the production of sugar, thus greatly increasing profitability. During this time he invented the first portable steam crane but did not patent it. In 1867 he patented solid India-rubber tyres for his road steamers. The Scotsman described this application of vulcanised India-rubber "the greatest step which had ever been made in the use of steam on common roads". The resilience of the stout rubber tyres allowed his lightweight five ton steam engine to run on hard or soft, wet or dry surfaces, over obstacles, uphill or downhill. In addition, the thick rubber tyres did not damage the roads as did the iron wheels of heavy traction engines. Thomson's first road steamers, manufactured by Tenants of Leith, were fitted with three wheels, the small single wheel at the front being directly below the steering wheel. The tyres, which were 125 mm (5") thick, were corrugated and adhered to the wheel by friction. Thomson's road steamers, often drawing four fully loaded coal wagons totaling 40 tons up and down steep gradients, excited great interest. Soon the first omnibus was in service between Edinburgh and Leith. Engines were exported to Java, India and Brazil, and by 1870 were being manufactured in the USA. Demonstrations of the engine's ability to plough effortlessly with two double-furrow ploughs had a major impact on farming practices and led to the eventual demise of the working farm horse. In 1873 R. W. Thomson, died at his home in Moray Place, Edinburgh

Robert Thomson's House



As you stand in Market Square you will see a plaque standing on an unprepossessing building on the south side of the square. Although it may not look much, it was once home to the most remarkable man to hail from Stonehaven, and one of the great unsung heroes of Scotland.

The name of Robert William Thomson may not be well-known even in his native land, but his gift for invention and the utterly prolific nature of his patenting rank him as one of the greatest of Scottish inventors. From steam tractors to self-filling fountain pens, his output was breathtaking and eclectic, but he is most celebrated as being the first inventor of pneumatic tyres. Fifty years before John Boyd Dunlop is credited with its invention, Thomson had submitted a patent for the very same article.

Thomson led a no less remarkable life than his inventions would suggest. He was born in the house in Stonehaven's Market Square on June 29th 1822, the eleventh of twelve children of the owner of the Carron Wool Mill. At the age of 14 a family dispute erupted - his parents wished Robert to study for the ministry, but the wilful youngster refused, and he left to live with an uncle in Charleston in the USA.

His stay in the New World was brief however, and two years later Thomson had returned to Stonehaven, where, with the help of a local weaver well versed in maths, he educated himself in chemistry and astronomy and acquired knowledge of electricity. His gift for invention was soon becoming apparent, and, a year after his return, at the tender age of 17, he had redesigned his mother's mangle, allowing wet washing to be passed through either end, built and designed a ribbon saw, and designed and built a prototype of a rotary steam engine which he was to continue working on for the rest of his life.

After serving his apprenticeship with an engineering firm in Aberdeen and Dundee, Thomson ended up working in Edinburgh, where he was

involved in the building of the Dean Bridge. While at this firm he came up with a method of detonating explosive charges using electricity, a technique which was to save countless lives in the mining industry. Thomson moved into the rapidly expanding field of railway line construction, setting up his own business as a railway consultant.

Thomson was only 23 when he made the patent which was to leave his mark on the world. The Pneumatic tyre - or "aerial wheel" as Thomson called it - was to transform road travel from an uncomfortable succession of bumps and jolts to a silent comfortable ride, and Thomson registered his patent on 10th December 1845. However, despite the undoubted advantages of the tyre, Thomson's invention and the man himself were to be largely forgotten, as, in 1845, not only were there no motor cars on the roads, there weren't even any bicycles to make use of his tyres, and with rubber prohibitively expensive (it cost £42 to fit one in 1847) lack of demand reduced pneumatic tyres to the level of a curiosity.

Thomson, however, did not let this setback depress him and he carried on inventing, devising, amongst other things: the first dry dock, improvements for machinery involved in sugar refining and the first travelling donkey-engined crane; as well as developments in such diverse areas as steam boilers and elastic beds. Thomson also patented steam tractors and steam buses, both of which went into production, and which used pneumatic tyres.

Robert William Thomson spent many years living in the Dutch East Indies (now Indonesia) where he met his wife, Clara. The couple returned to Scotland in 1862, settling in Edinburgh, where he died on 8th March 1873. Clara submitted his final patent, for elastic belts, later that year.