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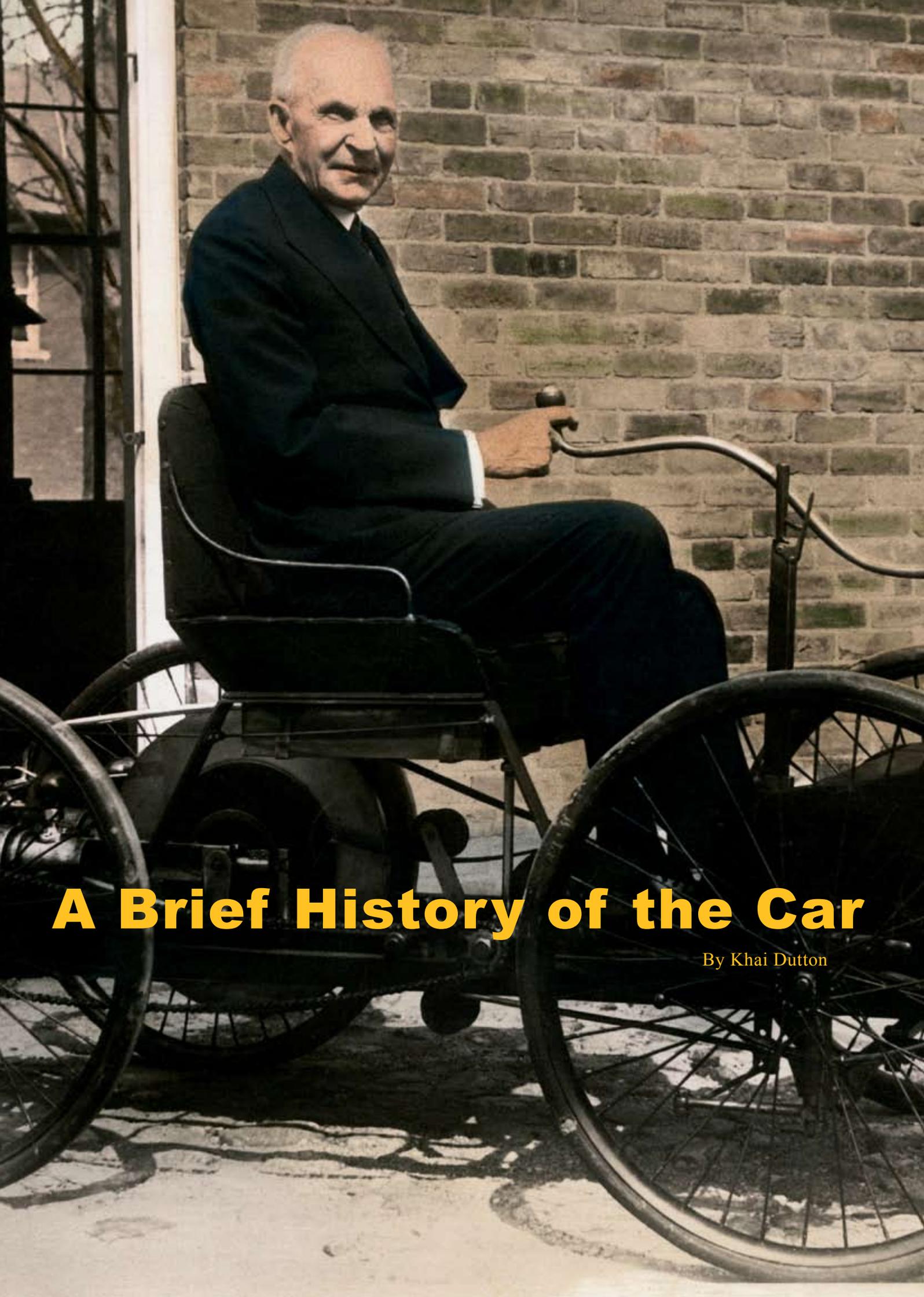
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# History of the Car

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# **A Brief History of the Car**

By Khai Dutton

Who invented the automobile? Did I hear you say Henry Ford? He did invent something critical, taking car manufacture to new heights. However, when his genius kicked into action, the first motorised vehicle had already been around for nearly 100 years.

As with many inventions, there is no defining point in history that states, “Today the car was invented.” Rather, it is an evolution of ideas and actions, beginning rather uneventfully with Leonardo da Vinci and Isaac Newton’s theoretical plans for a motor vehicle that ultimately led to the invention of the first self-propelled vehicle. But neither of these brilliant inventors put his plan into action. The ultimate honour of the first motorized vehicle is attributed by most historians to Nicolas Joseph Cugnot, an engineer and mechanic in the French Military.

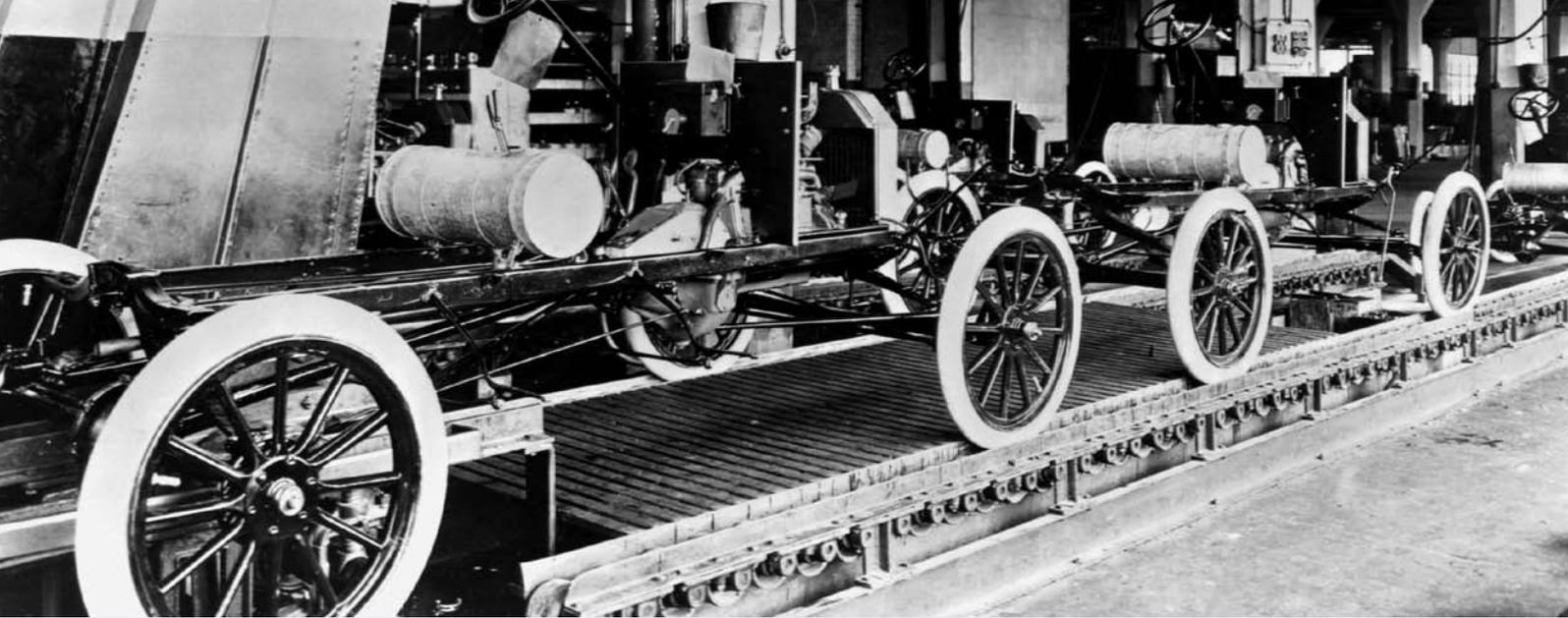
Nicolas Cugnot had begun experimenting with working models of steam-powered vehicles in 1765 and four years later was ready to construct his first working example. At the Paris Arsenal, Cugnot instructed his assistant mechanic, a man named Brezin, to construct a three-wheeled military tractor using a steam engine, which was to be used by the French army to haul heavy canons. Cugnot appears to have resolved the issue of converting the back-and-forth motion of a steam piston into a rotary motion. His Fardier à vapeur (steam wagon) was the first attempt, and the following year he made improvements to his great spluttering and hissing steam monster. The new vehicle had two rear wheels and one front wheel, which supported the steam boiler. It was steered by a tiller and reputed to have been capable of pulling four tonnes of artillery.

With a top speed of 4 km/h, and no horse power to speak of, the vehicle had to stop every ten to fifteen minutes to build up sufficient steam power to complete

the laborious task. A rather inelegant affair, but a breakthrough nonetheless.

Barely a year later, Cugnot took his invention a step further and built a steam-powered tricycle that could carry four passengers. But, he crashed the vehicle into a stone wall, forever etching his name in the history books as the first person to be involved in a motor vehicle accident. His bad luck continued when one of his patrons died and the other was exiled. Funds for Cugnot’s road vehicle experiments quickly dried up and his only reward for his innovative work was an annual pension of 600 francs, granted by King Louis XV. That too was withdrawn with the start of the French Revolution and Cugnot died in Paris, almost poverty stricken.

Other inventors around the world were quick to see the significance of Cugnot’s inventions and picked up the baton in the race to build the car. Frenchman, Onesiphore Pecqueur, improved on Cugnot’s early attempts and also invented the first differential gear. In 1789, American inventor Oliver Evans was granted the first US patent for a steam-powered land vehicle. Steam-powered vehicles were gradually improved by a number of other innovative characters around the world, but the vehicles remained rather cumbersome. Drawings of early vehicles depict large, ship-like structures on wheels with ungainly operating mechanisms. It’s almost inconceivable to imagine these vehicles manoeuvring around the streets of 17th Century Europe without causing damage and injury.



A small breakthrough came in 1807 when Francois Isaac de Rivaz of Switzerland invented an internal combustion engine that used a mixture of hydrogen and oxygen for fuel. Rivaz designed a car for his engine - the first internal combustion powered automobile, but his design attempts failed dismally. Undeterred, English engineer Samuel Brown was next, adapting an old Newcomen steam engine in 1824 to burn gas. But he only managed a brief trip up Shooter's Hill in London.

The invention of the first electric carriage somewhere between 1832 and 1839 (the exact date is not known) by Scotsman Robert Anderson did not improve the situation much. Although electric cars utilized rechargeable batteries that powered a small electric motor, vehicles remained heavy, slow, expensive, and frequently needed to stop to recharge the battery. Then in 1858, Belgian-born engineer, Jean Joseph Étienne Lenoir invented and patented (1860) a double-acting, electric spark-ignition internal combustion engine fuelled by coal gas. Five years after inventing his first combustion engine, Lenoir attached an improved engine (using petroleum and a primitive carburettor) to a three-wheeled wagon that managed to complete a historic fifty-mile road trip.

Finally the successes began to outweigh the failures. In the next ten years a number of inventors improved on existing engines but still no single person stood out as being the one to take the new technology to the next level, until 1876, that is.

By then, electrically powered vehicles had found better success in tramways and streetcars where a constant supply of electricity made them more practical. Private owners of steam and electric vehicles seemed to prefer gas-powered vehicles and began converting. The man responsible for the next big breakthrough was Niklaus August Otto. He not only improved on Lenoir's and de Rocha's design by inventing a more efficient gas engine, he also invented - and later patented - a successful four-stroke engine known as the Otto Cycle. The race to invent the first modern automobiles was truly underway and the pace picked up considerably.

In 1885, Gottlieb Daimler (who worked as technical director of Deutz Gasmotorenfabrik, which Nikolaus Otto co-owned) together with his design partner Wilhelm Maybach, took Otto's internal combustion engine a step further and patented what is generally recognized as the prototype of the modern gas engine. The Daimler-Maybach engine was small, lightweight, fast, used a gasoline-injected carburettor, and had a vertical cylinder. The size, speed, and efficiency of the engine allowed for a revolution in car design and Daimler is considered the first inventor of a practical internal combustion engine.

In the same year, German mechanical engineer Karl Benz integrated an internal combustion engine with a chassis - designing both together - and became the first inventor to design and build the world's first practical automobile to be powered by an internal combustion

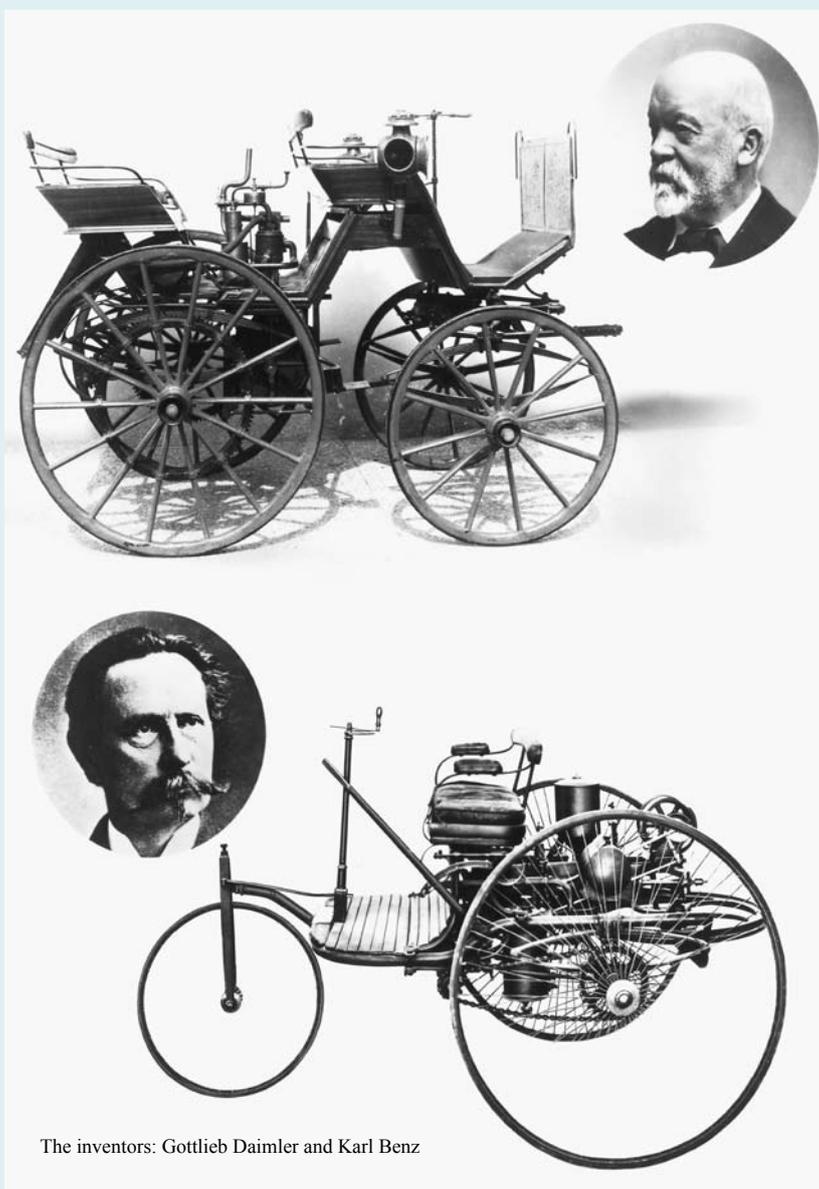
It didn't take long for Ford to become the world's biggest car manufacturer. By 1927, 15 million Model T's had been manufactured. The car had become cheaper to produce and Ford's dream had been realised – he had brought the automobile to the masses.

engine. On 29 January 1886, Benz received the first patent (DRP No. 37435) for a gas-fuelled car – a three-wheeled affair.

Hot on his wheels, on 8 March 1886, Daimler designed the world's first four-wheeled automobile by adapting a stagecoach to hold his new engine. Three years later, he invented a V-slanted two-cylinder, four-stroke engine with mushroom shaped valves. This revolutionary design set the standard going forward for all car engines. At the same time Daimler and Maybach moved away from adapting other vehicles and purpose-built an automobile from the ground up. This new Daimler vehicle had a four-speed transmission and obtained speeds of 10 mph. Daimler founded the Daimler Motoren-Gesellschaft company in 1890 and began manufacturing his designs. A year later, Benz produced his first four-wheeled car and his company, Benz & Cie, began to grow.

But neither Daimler Motoren-Gesellschaft nor Benz & Cie were the first car manufacturers (i.e. builders of entire motor vehicles for sale, not just engine inventors who experimented with car design to test their engines). That honour went to French companies Panhard & Levassor (1889) and Peugeot (1891). Panhard & Levassor were commissioned by Edouard Sarazin, who held the license rights to the Daimler patent for France, to build their first car in 1890.

They not only produced the car but made improvements to the automotive body design. Their vehicles were manufactured with a pedal-operated clutch, a chain trans-



The inventors: Gottlieb Daimler and Karl Benz

Since its rather modest beginnings, the automotive industry has grown to become the main industrial employer worldwide. More than 10 million people produce a staggering 60 million vehicles each year. That equates to two vehicles every second!

**The first automobile to be mass-produced in the United States was the 1901 Curved Dash Oldsmobile.**

mission leading to a change-speed gearbox, and a front radiator. In fact, Levassor was the first designer to move the engine to the front of the car and use a rear-wheel drive layout to provide better balance and improved steering. The Systeme Panhard design quickly became the standard for all cars. Panhard & Levassor are also credited with the invention of the modern transmission - installed in their 1895 Panhard.

**“Levassor was the first designer to move the engine to the front of the car”**

Early French manufacturers did not produce standardised car models - each car was different from the next. The first standardized car was the 1894 Benz Velo. One hundred and thirty four identical Velo's were manufactured in the following year. Despite the fact that Benz & Cie had entered the manufacturing arena later than Panhard and Levassor, Benz's company rapidly became the world's largest manufacturer of automobiles by 1900.

The licensing rights to Daimler motors were shared by Panhard & Levassor and Armand Peugeot, but Peugeot produced a car that went on to win the first real car race, the “Paris to Marseille” race of 1897. The historic win gained Peugeot enormous publicity and boosted car sales but sadly resulted in a fatal auto accident, killing Emile Levassor.

Already, many of the vehicles being produced around

the world were protected by patents. George Selden, a patent attorney from Rochester, New York saw a gap and unscrupulously filed a patent for what he called a “road engine” in 1879. Due to the patent laws at that time, he was able to pre-date his patent by two years. Over the years, Selden expanded the claims of his patent and when it was finally granted in 1895, Selden held a patent for a three cylinder motor vehicle that over the next few years allowed him to collect royalties from all American car manufacturers – he had never built a car in his life!

On the other side of the ocean, the Americans still favoured electric vehicles around 1900. But sales quickly fell as new vehicles driven by the internal combustion engine gained popularity. America's first gasoline-powered commercial car manufacturers were brothers Charles and Frank Duryea. Originally bicycle makers, they became interested in gasoline engines and automobiles and built their first motor vehicle, the Duryea, in 1893, in Springfield, Massachusetts. Three year on, they had only sold thirteen models of the expensive limousine, which remained in production into the 1920's, but which was never really mass-produced. The first automobile to be mass-produced in the United States was the 1901 Curved Dash Oldsmobile, built by the American car manufacturer Ransome Eli Olds.

Olds first began making steam and gasoline engines with his father, Pliny Fisk Olds, in Lansing, Michigan in 1885. He designed his first steam-powered car



The car is still one of man's greatest inventions



within two years and, in 1899, with a growing experience of gasoline engines, Olds moved to Detroit to start the Olds Motor Works, invented the basic concept of the assembly line and began producing low-priced cars. He produced 425 Curved Dash Olds in 1901, and was America's leading auto manufacturer from 1901 to 1904.

Henry Ford, also an American car manufacturer at the time, designed his first car, called the Quadricycle, in June 1896. However, he only achieved real success after forming the Ford Motor Company in 1903. This was the third car manufacturing company formed to produce the cars he designed. He had a vision to make automobiles affordable to the general population. Ford vehemently opposed paying any licensing fees to George Selden, believing his patent rights to be questionable. Selden was furious and took Ford to court. A bitter and lengthy battle ensued. In 1904 the judge ordered that an automobile be built according to the George Selden Patent. The car failed dismally.

Then Ford introduced the famous Model T in 1908, which was an instant success. In 1911 the Selden patent was overturned and George Selden was unable to collect further royalties. The American car manufacturers were now free to produce cars at a lower cost. Henry Ford wasted no time and went on to improve the assembly line process to reduce the costs of car manufacture. Around 1913, he installed the first conveyor belt based assembly line in his Highland Park, Michigan plant. The assembly line drastically

reduced production costs by reducing assembly time. His famous Model T was assembled in a mere ninety-three minutes! And you could choose it in any colour as long as it was black.

The history of the car didn't stop with Ford. Car manufacturers today continue to innovate at a rapid rate. Each new innovation is protected by patent in a fiercely competitive industry. This, no doubt, improves the car for our benefit.