

August Borsig (1804-1854)



August Borsig (1804-1854)

As Berlin-born political essayist and satirist Kurt Tucholsky once wrote: “*True Berliners all come from Poznań or Wrocław.*” In that sense, August Borsig was indeed a true Berliner. Born in Wrocław (or Breslau, as it was known in German at the time), at first it looked as if he would take on his father’s profession as a carpenter.

Starting in 1819, he was apprenticed to the master carpenter who had trained his father, spending his summers working in the master’s workshop and taking advantage of slow business in the winter to learn the theory behind the profession at the College for Arts and Building in Wrocław. He received good grades and, once he had completed his apprenticeship in 1823, he was offered a scholarship to continue his studies at the Royal Prussian College for Tradesmen. Recently founded with the aim of supporting the development of industry in Prussia, the school offered Borsig the chance to change his subject of focus from carpentry to machine-building and, although he did so, he does not seem to have been happy at the college, leaving after less than two years without finishing his course. It may have been the heavily theoretical nature of the curriculum that led him to leave, since his next move was to start as a trainee at the foundry of machine builder Franz Anton Egells. He was so successful at Egells’ foundry that he was made a foreman at the exceptionally young age of 23, marrying Louise Praschl, daughter of a parson, a year later in 1828. The following year, his only son Albert was born.

It would seem that, for several reasons, he was already considering going into business under his own name at this time. Not only did his contract run for a fixed term of 8 years, but both Egells and his customers were more than satisfied with his work, as several references he received show. Since he received commission on the company’s turnover, by 1836 he had been able to save a substantial sum to set himself up with.

Borsig started making preparations for his own business while he was still working for Egells in 1836, applying for a license to run an iron foundry and buying two pieces of land on Thurmstrasse and Chausseestrasse right next to Egells’ site. He was also granted citizenship in the city of Berlin in that year.

In 1837, Borsig was ready to operate under his own name, and after founding his company, began to gradually expand his site as his orders increased and he started to manufacture steam locomotives. At the same time, he took several exemplary measures for his workers’ welfare, setting up a health insurance fund into which both he and his employees paid contributions; he even required an entrance fee from visitors to his park and greenhouses and put this into the insurance scheme. In addition to this, Borsig made sure to pay his employees more than the going rate: with an income of 250 to 500 Prussian thalers a year, Borsig workers earned almost as much as tradesmen, freight carriers, and innkeepers.

Over the years, Borsig added iron and steel mills in Berlin's Moabit district to his foundry and workshop, making him independent from British suppliers. By 1854, August Borsig had reached the high point of his achievements as a businessman and pillar of Prussian society: he had been named Privy Councilor for Commercial Affairs by King Frederick William IV and presided over celebrations for his 500th locomotive when, in the summer of that year, he was struck down by a stroke. August Borsig died on July 6 at the age of 50, leaving his son Albert a hugely successful company and an enormous personal fortune of 7 million Prussian thalers. Although the first prestige projects the young industrialist had taken on in Prussia had not contributed much to this sum, they had given the company a reputation on which its later financial success was built.



August Borsig's grave at the Dorotheenstädischer Friedhof, a cemetery, depicted by Heinrich von Strack in 1865 (lithograph). From 1988 to 1991, the grave was lovingly restored with financial support from Borsig.

A Fountain with 80 Horsepower: Borsig Builds a Pumping Station at Sanssouci

“Dearest Mr. Borsig, his Majesty the King has just bestowed his approval on the fountain works in their entirety.” With this letter, Borsig’s young company received its first large-scale construction project – from none less than the King of Prussia himself, at whose Potsdam Palace Borsig was now to build a set of fountains.



The Great Fountain in the Sanssouci Palace Gardens, Potsdam, painted in watercolors by Johann Heinrich Hintze, 1844.

The King’s great uncle, Frederick the Great had started work on the Sanssouci Palace in 1745, and his plans had called for the huge gardens surrounding the building to be fitted with fountains. He would never live to see this wish come true, however, since a comprehensive watering system would have been needed since the kind of comprehensive watering system required would have been extremely difficult to develop and implement in the 18th century. His immediate successors had neither the interest nor the resources to realize the original plans, and it was not until Frederick’s great nephew, Frederick William IV, ascended to the throne in June 1840 that the idea was re-examined. The new king commissioned Borsig with the work and, after 100 years in abeyance, the fountains now became a matter of royal priority.

In August, Borsig was finally apprised of the technical requirements, delivering the first design just six weeks later. Borsig would build the steam engine and pumping station, as well as laying the pipes to supply the fountains with water. August Borsig was responsible not just for the mechanical side of the project, but also for its architectural form, requiring both his technical and aesthetic skills. At the same time, the king had very clear ideas about how the fountains should look and work.

This state-funded project was not without its difficulties, however. By spring 1841, there were doubts as to whether the fountain system would be completed by summer 1842, as was the royal wish. Not only did the young company have no experience as yet of building machinery on this scale, it did not even have the equipment needed for the project it had taken on. A Borsig employee was swiftly dispatched to Britain to acquire what was needed, which was a long and arduous process at the time. Furthermore, the 80 horsepower (hp) steam engine to drive the pumping station was of completely novel dimensions, being the biggest machine in the whole of Prussia at the time.

On October 23, 1842, Frederick William IV was able to admire the engine in place in the palace gardens of Sanssouci as it sent a stream of water 6.5 centimeters in diameter from the middle of the great fountain 36 meters into the air. Despite having to pay a contractual penalty of 350 Prussian thalers due to the late readiness of the fountains, the company had shown its expertise in this area. Borsig’s work spoke for itself and no-one could doubt the abilities of this carpenter turned industrialist. At the end of the 19th century, the water works were to be extended, with the volume pumped increased from 250,000 to 600,000 cubic meters – and the company hired to build the new pumps, boiler, and steam engine was none other than Borsig. In 1904, the company delivered another 80 hp steam engine, which the company had constructed based on the experience gained from the 5,000 steam locomotives it had already built. The first of these was the Borsig 1 of 1841.



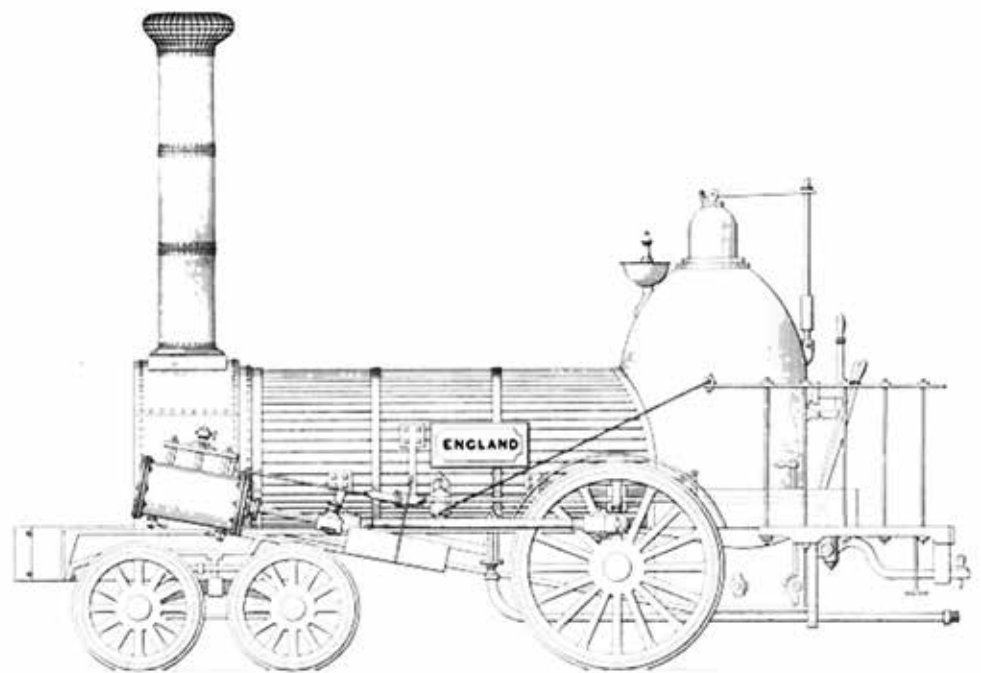
The pumping station for the Sanssouci Palace Gardens fountains, built in 1841-1843 in Islamic mosque architecture. (Photograph: Michiel 1972)

Number 1: The Prussian Locomotive

Despite the fear and loathing it engendered in many, the advance of the railway was relentless and could not be stopped. The steam engines on which Prussian railways were dependent, however, continued to be imported from Britain, the land of their birth, or from the United States. This infuriated Borsig, who had started repairing locomotives at his works in 1838 and was convinced that he could build them, too. Along with his employee and confidant Friedrich Wöhlert, he decided to try.

Two engines produced by William Norris of Philadelphia would serve as a basis for his first designs: Norris had been building locomotives since 1832 and had sold two – the Prussia and the America – to the Berlin-Potsdam Railway, Borsig's first-ever customer, in September 1839. By early 1840, Borsig had seen the blueprints for the two Norris engines. Two years later, Borsig 1, the first Prussian steam locomotive ever, was ready. Leaving from the newly opened Anhalter Bahnhof in Berlin as it was taken into service alongside eleven locomotives built by British competitor Stephenson, it proved to be so fast and so reliable that Borsig was soon taking orders for more.

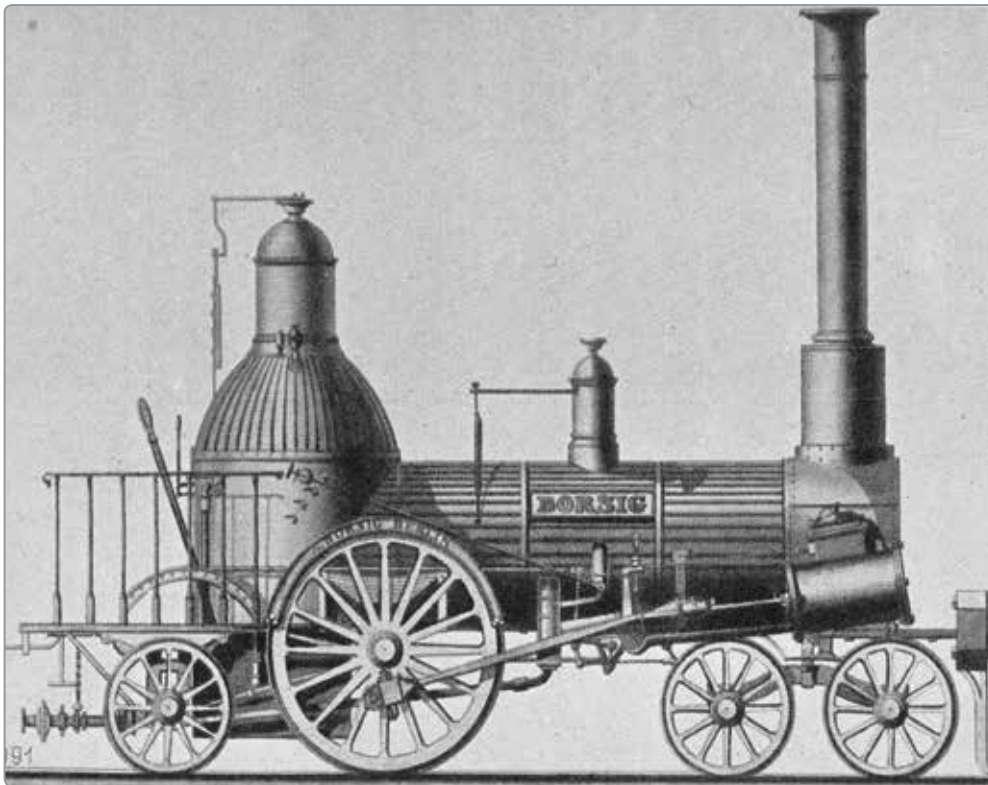
In building his first locomotive, August Borsig had been careful to change the Norris design he was working with just enough to avoid infringing on the American builder's patents, but the similarities remained visible: just like its blueprints, the Borsig had a rear driving axle and two carrying sets of wheels on a bogie (a bogie being two or more sets of wheels spring-mounted in a frame which can turn independently of the carriage or locomotive to which they are attached).



The England by William Norris, around 1840.

Where Borsig's locomotive differed was in the power it produced: he lengthened the boiler, spreading its increased weight over both a front bogie and an extra rear dead axle. He also moved the driving axle further forward than it had been in Norris' design, which allowed it to carry more of the vertical boiler's load. This meant that the Borsig distributed its weight in a very balanced way, giving it higher torque and thus more purchase on the rails, which in turn translated into higher speeds. Another respect in which Borsig's design differed from Norris' was his adoption of British methods for controlling steam in the cylinders. Together, these design features laid the foundations for Borsig's success in locomotive building.

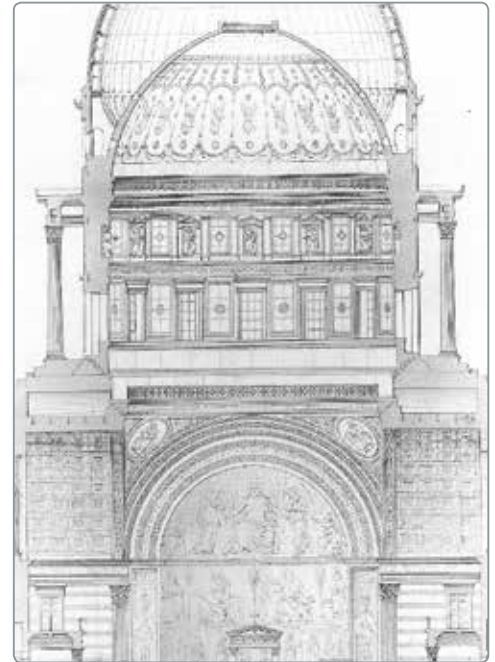
In Prussia, Borsig was a lone pioneer. Along with J. A. Maffei of Munich and the Maschinenbau-Gesellschaft in Karlsruhe, who had started building locomotives in 1841, Borsig was one of the only three manufacturers in Germany who started to compete with foreign companies, some of whom had had a 20-year head start in steam engine construction. The design features Borsig used for his locomotives would later become known as the Borsig Original Model and provide the standard blueprint for all Prussian express and passenger steam locomotives. Meanwhile, along with the neighboring factory of his former boss Franz Anton Egell, Borsig's works became one of the centers of industrialization in Prussia, training engineers and industrialists who would then go on to spread their knowledge across the country. Friedrich Wöhlert and Louis Schwartzkopff, who both went on to become locomotive builders outside Berlin's Oranienburger Tor, are just two examples of this new generation. Yet at the beginning, the company Borsig was nowhere near as well known for locomotives as it was for spectacular construction projects.



August Borsig's first locomotive, the Borsig 1, in 1841.

Iron Visions: Domes in Potsdam and Berlin

When it was designed, the Nikolaikirche in Potsdam was supposed to have a huge dome and four towers, one on each corner. Yet at its consecration in 1837, it had neither towers nor a dome. With its simple sloping roof, it looked somewhat pathetic next to Potsdam's pompous Stadtschloss, and King Frederick William IV was not amused. Three years later, he commissioned August Borsig to finish the church in the way its architect Schinkel had intended.



The Nikolaikirche, Potsdam, (left); a cross-section view of the dome for the Nikolaikirche, 1858, engraving by Gustav Emil Prüfer (right).

Designing the church, Schinkel had imagined a dome like the one on Paris' Pantheon, but his ambitious plans could not be realized in the 1830s, as Prussia simply ran out of money. It was not just his idea for a dome that fell victim to the economic downturn either, as cheaper materials than Schinkel had stipulated were used to complete the church. By 1840, however, the state coffers were fuller than they had been, and the new king decided to have the church rebuilt. Yet even if money was no longer an object, the technical side of the dome project was anything but straightforward. The low-grade materials substituted during construction meant that cracks were already starting to appear in the new building, and so Schinkel's dome would have to be lighter or smaller than originally planned. Several structural engineers declared that it simply could not be done. Not August Borsig, however, who had studied domes during his time at the Wroclaw College for Arts and Building. By using cast iron, Borsig made a dome for the Nikolaikirche that was the same size as in Schinkel's plans, but a fifth lighter.

At first, however, Borsig was not even commissioned with constructing the dome. He had built the fountain pumps at Sanssouci, but this time, his only job was to deliver a high-pressure steam engine to process the building materials – at the king's behest, of course. The

first documents mentioning Borsig's company as builders of domes date from early 1846, although after this there is plenty of material showing how Borsig and the master builder on the Nikolaikirche, Gustav Emil Prüfer, exchanged ideas about the project. In terms of the building, Prüfer deferred to Borsig, sending him a blueprint for a wrought-iron dome in December 1846 and writing, "Perhaps you will be able to make something better and more suit-



The Berlin Stadtschloss, around 1900.

ing?" Which Borsig then did, designing a graceful iron framework to which zinc plating would be attached. The king placed an order for this dome for 13,000 Prussian thalers, which was a real bargain in view of the fact that just ten years before, Prussia had been dependent on imports from Britain for wrought and cast iron, leading to astronomical prices for projects of this scale. Borsig's foundry meant that domestically-produced iron could now take the place of expensive foreign materials.

It was cast iron which made Schinkel's dome possible again, and Borsig's company was key in showing the possibilities of this material. This made the firm into an expert in the field of dome construction – this, and the fact that the company had produced a dome for none less than the king himself. Just three months after the Nikolaikirche project was finished, the Borsig works was already building its next Schinkel-designed dome for the Berlin Stadtschloss.

In Berlin alone, the company constructed the roof and stairs of the king's palace, the tower of the Petrikirche on Gertraudenstrasse, and the domes for the stock exchange building and the hall of fame in the armory building. Yet for all the kudos these projects brought the company, steam locomotives were what would make Borsig a respected name across the world.