

This Day in History... April 9, 1865

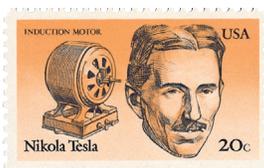
Birth of Charles Steinmetz

Mathematician and electrical engineer Charles Proteus Steinmetz was born Karl August Rudolph Steinmetz on April 9, 1865, in Breslau, Province of Silesia, Prussia (present-day Wrocław, Poland). Steinmetz developed the electrical theories that allowed for the expansion of the electric power industry. He was also known as the “Forger of Thunderbolts” and the “Wizard of Schenectady.”

Steinmetz displayed a high proficiency for math and science from an early age, impressing his teachers at the Johannes Gymnasium. He went on to attend the University of Breslau in 1883. By 1888, he had nearly earned his doctorate degree when he came under investigation by the German police for his involvement in a socialist university group and newspaper. Both were banned in Germany, so Steinmetz fled to Zurich.

In 1889, Steinmetz moved to the US and changed his name to the more American-sounding Charles. He also adopted the middle name Proteus, after a smart hunchbacked character from the *Odyssey* (Steinmetz himself had a hunchback and stood at four feet tall as an adult).

Upon his arrival in the US, Steinmetz began working for Rudolph Eickemeyer in Yonkers, New York. There he explored magnetic hysteresis, the process by which magnets become and remain magnetic permanently. This research earned him international attention. In 1893, Eickemeyer’s company was purchased and re-established as General Electric. Steinmetz quickly became GE’s engineering wizard.



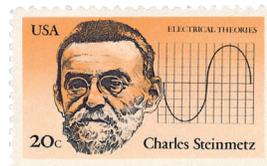
Steinmetz patented GE’s AC distribution system based on principles established by himself and Nikola Tesla.

Steinmetz was a pioneer in AC circuit theory and analysis. Up to this time, this work required complicated and lengthy calculus. In 1893, Steinmetz published the paper, “Complex Quantities and Their Use in Electrical Engineering” for the American Institute of Electrical Engineers. Steinmetz managed to transform this method into “a simple problem of algebra.” He established the use of the letter “j” as a complex number phasor to represent the rotation in AC system analysis. This and Steinmetz’s other papers “taught a whole generation of engineers how to deal with AC phenomena.”

Steinmetz also vastly increased our understanding of lightning. He became famous for being able to create man-made lightning in a laboratory the size of a football field. That earned him the nickname, “Forger of Thunderbolts.” Steinmetz also built a tower to study natural lightning to learn more about its patterns and effects.

Steinmetz served as chair of electrical engineering at Union College from 1902 to 1913 and continued as a professor until 1923. He was also on the Schenectady Board of Education and President of the Common Council of Schenectady. Additionally, he was president of the American Institute of Electrical Engineers from 1901 to 1902 and the first vice president of the International Association of Municipal Electricians. He even founded America’s first glider club, though none of their gliders managed to fly. Steinmetz died on October 26, 1923.

Steinmetz had over 200 patents by the time of his death. Several scientific processes carry his name, including Steinmetz’s equation (to find the heat energy of magnetic hysteresis), the Steinmetz solid (the body created by intersecting cylinders at right angles), and the Steinmetz equivalent circuit theory (to design and test induction motors). Additionally, the Institute of Electrical and Electronics Engineers’ highest award is named after him as well as a lecture series and scholarship.



Steinmetz stamp from the 1983 American Inventors Issue



Steinmetz devised methods of harnessing high voltage for the Niagara Falls Power Plant.

This Day in History... April 9, 1865

Birth of Charles Steinmetz

Mathematician and electrical engineer Charles Proteus Steinmetz was born Karl August Rudolph Steinmetz on April 9, 1865, in Breslau, Province of Silesia, Prussia (present-day Wrocław, Poland). Steinmetz developed the electrical theories that allowed for the expansion of the electric power industry. He was also known as the “Forger of Thunderbolts” and the “Wizard of Schenectady.”

Steinmetz displayed a high proficiency for math and science from an early age, impressing his teachers at the Johannes Gymnasium. He went on to attend the University of Breslau in 1883. By 1888, he had nearly earned his doctorate degree when he came under investigation by the German police for his involvement in a socialist university group and newspaper. Both were banned in Germany, so Steinmetz fled to Zurich.

In 1889, Steinmetz moved to the US and changed his name to the more American-sounding Charles. He also adopted the middle name Proteus, after a smart hunchbacked character from the *Odyssey* (Steinmetz himself had a hunchback and stood at four feet tall as an adult).

Upon his arrival in the US, Steinmetz began working for Rudolph Eickemeyer in Yonkers, New York. There he explored magnetic hysteresis, the process by which magnets become and remain magnetic permanently. This research earned him international attention. In 1893, Eickemeyer’s company was purchased and re-established as General Electric. Steinmetz quickly became GE’s engineering wizard.



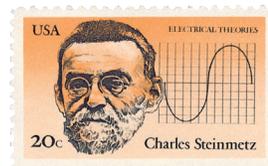
Steinmetz patented GE’s AC distribution system based on principles established by himself and Nikola Tesla.

Steinmetz was a pioneer in AC circuit theory and analysis. Up to this time, this work required complicated and lengthy calculus. In 1893, Steinmetz published the paper, “Complex Quantities and Their Use in Electrical Engineering” for the American Institute of Electrical Engineers. Steinmetz managed to transform this method into “a simple problem of algebra.” He established the use of the letter “j” as a complex number phasor to represent the rotation in AC system analysis. This and Steinmetz’s other papers “taught a whole generation of engineers how to deal with AC phenomena.”

Steinmetz also vastly increased our understanding of lightning. He became famous for being able to create man-made lightning in a laboratory the size of a football field. That earned him the nickname, “Forger of Thunderbolts.” Steinmetz also built a tower to study natural lightning to learn more about its patterns and effects.

Steinmetz served as chair of electrical engineering at Union College from 1902 to 1913 and continued as a professor until 1923. He was also on the Schenectady Board of Education and President of the Common Council of Schenectady. Additionally, he was president of the American Institute of Electrical Engineers from 1901 to 1902 and the first vice president of the International Association of Municipal Electricians. He even founded America’s first glider club, though none of their gliders managed to fly. Steinmetz died on October 26, 1923.

Steinmetz had over 200 patents by the time of his death. Several scientific processes carry his name, including Steinmetz’s equation (to find the heat energy of magnetic hysteresis), the Steinmetz solid (the body created by intersecting cylinders at right angles), and the Steinmetz equivalent circuit theory (to design and test induction motors). Additionally, the Institute of Electrical and Electronics Engineers’ highest award is named after him as well as a lecture series and scholarship.



Steinmetz stamp from the 1983 American Inventors Issue



Steinmetz devised methods of harnessing high voltage for the Niagara Falls Power Plant.