



## Albert Einstein and Ignacy Mościcki's, Patent Application

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Much was said and written during the 2005 World Year of Physics about Einstein's work in the Bern, Switzerland Patent Office (Fig. 1). He took the post (Technical Expert 3rd Class) there after completing his studies at the Zurich Polytechnic (later called ETH) in 1900 and unsuccessful attempts to obtain a university position. However, little seems to be known of the patent applications he examined during his five years at the office in Bern. This paper discusses one of those applications – one that was submitted by a rather remarkable individual. It is well-known that Einstein's period in the Patent Office, in spite of a very turbulent family life, was the most fruitful of his career. Great attention has, of course, been given to Einstein's papers of 1905 (his *Annus Mirabilis*), but what was he doing during the hours spent in the office? What sorts of patent applications did he work with? We know one specific example because the inventor himself is well-known. In 1905 Einstein reviewed the construction details of a special arc furnace employing a rotating electric arc and used for the production of nitric acid, needed in the manufacture of agricultural chemicals and in other industrial applications. The system was invented by Ignacy Mościcki. The field generated by an electromagnet was used to rotate the arc. The 26-year-old physicist and the still young (38) but already renowned inventor and scholar met and discussed the patented idea. Einstein was curious to know why an electric arc changed its orientation in a magnetic field. A sample drawing illustrating the patented idea is shown in Fig. 2.



Fig. 1. Einstein at the Patent Office in Bern

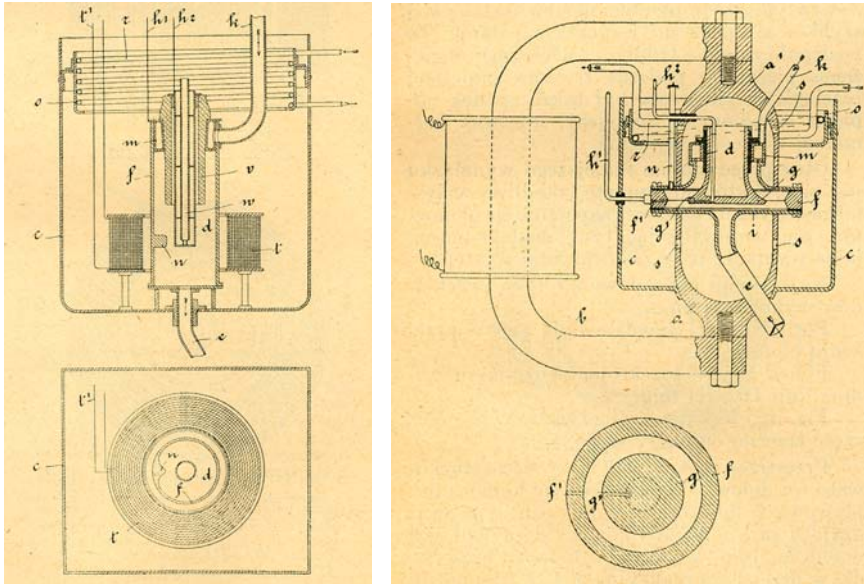


Fig. 2. Drawings from the Swiss Patent Office (Patent No. 35840).

It looks as it is rather technical, but of course Einstein had studied at a technical university and it was no problem for him to read and understand such diagrams. Also, we know that electrical engineering was his family business (his father Hermann and uncle Jacob were involved in the production of dynamos and electric motors). We don't know how many patent applicants Einstein may have met during his working years in Bern, but we do know that he met Ignacy Mościcki personally. Who was Ignacy Mościcki (Fig. 3)? He was a Pole and former assistant to Józef Wierusz-Kowalski (1896), professor of physics, and rector (provost) at Albert-Ludwigs University in Freiburg, Switzerland.

Mościcki was very skilled in laboratory work; in Freiburg he organized an instructional modern physics lab. He was also a very productive inventor. His specialty was electric technology, especially high-voltage (100,000 V) capacitors and methods for safely transmitting electricity over long distances. Mościcki needed high-voltage capacitors for creating electric arc discharges. At that time this subject was quite fashionable and many other physicists were working on it, among them William Crookes. Electric arcs in air result in the production of nitric oxide. Mościcki patented a method for the cheap industrial production of nitric acid, and he was one of the first to use atmospheric nitrogen to produce nitric acid on an industrial scale. As a designer of super-power capacitors, he was recognized

as one of the best European specialists in the field. He became a successful businessman in Switzerland. After WWI he became professor of electrochemistry at Lwów Polytechnic in Poland (now Lviv, Ukraine) and in 1925 was elected rector. That same year he moved to the Warsaw Polytechnic and the next year he became president of Poland.



Fig. 3. Ignacy Mościcki (1867–1946), scholar, scientist, and inventor; holder of honorary doctorates from numerous Polish and foreign universities; president of Poland (1926–1939).

How did this come about? As a young student of chemistry in St. Petersburg, Russia, Mościcki was an active socialist. Later, back in Poland, he participated in a failed attempt on the life of the tsarist governor of Warsaw. In 1892 he was threatened with arrest and escaped to London where he met Józef Piłsudski, who was to become one of the most important people in Polish history. In 1920 Marshal Piłsudski led the forces that defeated the Soviet army at the Battle of Warsaw. This and subsequent battlefield successes led to Poland's victory in the Polish/Soviet war and saved weakened by WWI Europe from the threat of Soviet conquest. After Piłsudski engineered a coup d'état in Poland, Ignacy Mościcki was asked to become the president. He gave up his academic positions and served as president of the Republic from 1926 until the outbreak of the WWII in 1939.

Among his other titles, Mościcki is known as the father of the chemical industry in Poland. A town in southern Poland (Mościce) is named after him. And one of his many patent applications was studied by a young technical expert, Albert Einstein, in Bern, Switzerland.

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