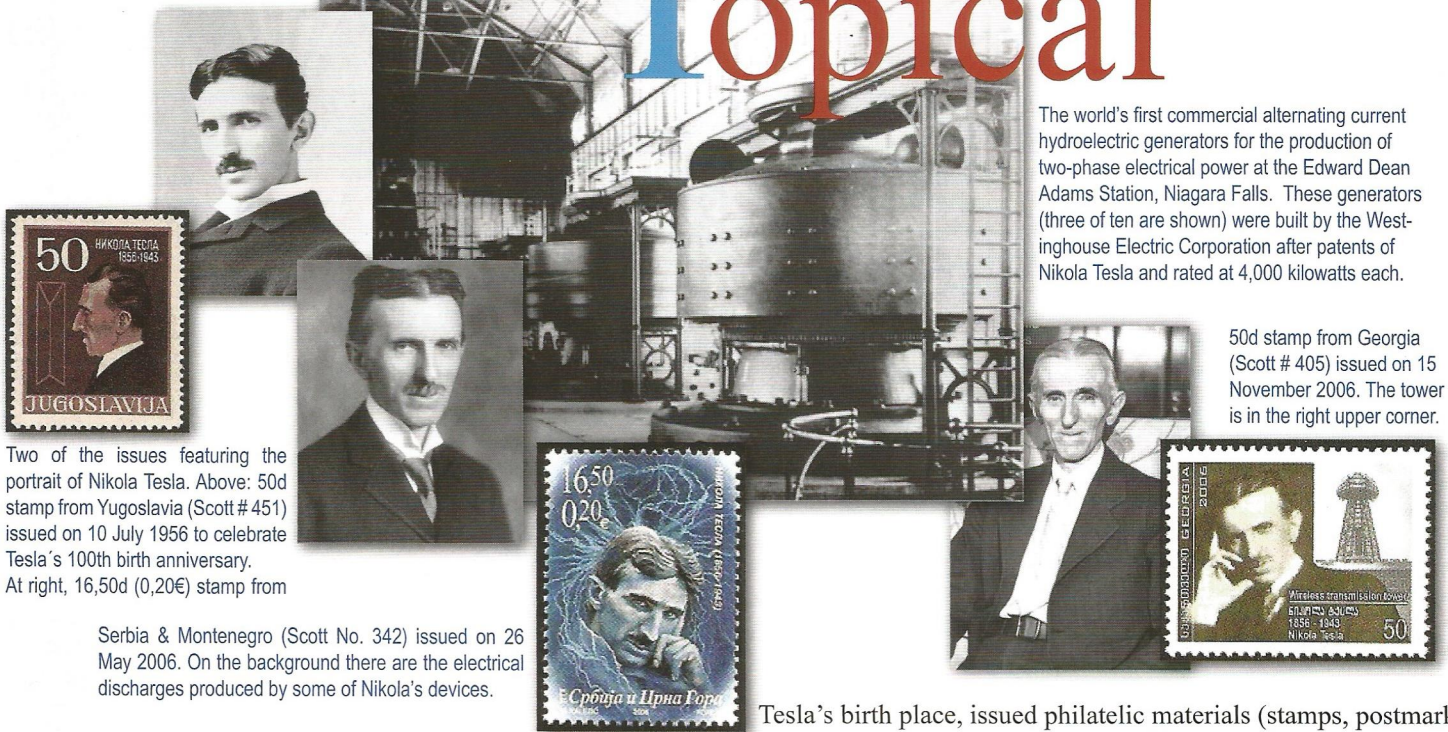


A Tesla T Topical

By Fábio S. Flosi



The world's first commercial alternating current hydroelectric generators for the production of two-phase electrical power at the Edward Dean Adams Station, Niagara Falls. These generators (three of ten are shown) were built by the Westinghouse Electric Corporation after patents of Nikola Tesla and rated at 4,000 kilowatts each.

50d stamp from Georgia (Scott # 405) issued on 15 November 2006. The tower is in the right upper corner.

Two of the issues featuring the portrait of Nikola Tesla. Above: 50d stamp from Yugoslavia (Scott # 451) issued on 10 July 1956 to celebrate Tesla's 100th birth anniversary. At right, 16,50d (0,20€) stamp from

Serbia & Montenegro (Scott No. 342) issued on 26 May 2006. On the background there are the electrical discharges produced by some of Nikola's devices.

NIKOLA TESLA was a great Yugoslav-American electrical engineer and inventor. His discoveries in the field of electricity advanced the United States and the rest of the world into the modern industrial era. Called "the man out of time", he pioneered many areas of electrical technology. Over seven hundred patents were issued to him worldwide, mostly in the U.S. and U.K.

We will mention his most important inventions and discoveries. Several philatelic items featuring the scientist and his apparatus will be commented upon. Fifteen stamps, one FDC, two souvenir sheets and three pictorial postmarks will be shown together with their full descriptions.

Nikola Tesla's birthday

Tesla was born between the 9th and 10th of July 1856, in the small village of Smilijan, in Croatia (the former Yugoslavia). According to legend, he was born precisely at midnight and the sky was illuminated up by lightning due to a severe storm. Coincidence or not, "lightning" later on became one of his main areas of experiments, discoveries and inventions.

The Republic of Croatia (known as Republika Hrvatska) is a central European country and its capital is Zagreb. Several countries around the world, including those European countries near

[Editor's Note: Fábio S. Flosi, who resides in Brazil, is our newest writer—assigned by your editor to offer some commentaries on particularly enticing subjects for a topical/thematic collection. Tesla is a good pick to start. An incredibly amazing individual, honored many times on stamps, fun to learn about, and largely unsung in today's world.]

Tesla's birth place, issued philatelic materials (stamps, postmarks, souvenir sheets, maximum cards, FDCs and booklets) to commemorate Tesla's birthday.

For example, his 100th anniversary was celebrated by Yugoslavia with a series of four stamps (Scott # 448, 449, 450 and 451). His 150th anniversary was celebrated by many countries too, including Serbia & Montenegro.

Nikola Tesla's main invention

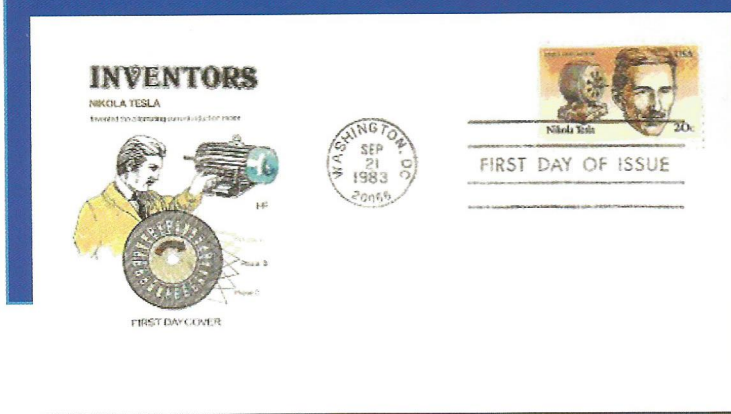
While studying electrical engineering, from 1875 to 1878, at the Polytechnic Institute of Graz (near Vienna, Austria) Tesla became fascinated with electromagnetism (electricity and magnetism). In February 1882, while walking through a city park in Budapest, suddenly, in a flash of inspiration, he mentally conceived the theory for the "rotating magnetic field", which is the principle of the "alternating current induction motor", one of Tesla's most important inventions. Around 90% of all electric motors in the world are operating on the principle of Tesla's "rotating magnetic field".

The prototype of this main invention appears on many stamps issued to honor the scientist.

Alternating Current (abbreviation: AC) is an electric current which periodically alternates its direction of flow (for example, 60 times per second or 60 cycles per second). It is delivered by the outlets (female receptacles) we find at home, in the office, etc., and which supply operating power to the equipments (TV receivers, CD players, computers, printers, etc.) plugged into them.

Immigration to the United States

That day in February 1882, while walking through the park, Tesla not only created the principle of "rotating magnetic" field, but he conceived the entire theory of the "multi-phase AC system" for electrical power generation, transmission for long distances and distribution. So, his dream was to go to America to harness the



On September 21, 1983, the U.S. Postal Service issued a set of four stamps called "American Inventors". One of the 20¢ stamps (Scott # 2057) honors Nikola Tesla. On the left corner of the envelope Tesla is handling his AC motor (in reality, a three-phase induction motor).

power of the water of Niagara Falls and to apply his AC theory.

In 1884, Tesla immigrated to the United States. He arrived in Manhattan, in June that year, and spent the rest of his productive life of inventions living in the city of New York, N.Y.

In 1888 he patented the "AC induction motor." Until today this machine is widely used in household appliances like refrigerators, clothes washers, blenders, food processors, mixers, etc.

Tesla's induction coil

In 1889, he invented a new electric apparatus (the "induction coil"), a kind of "transformer" that generates a high AC voltage at a high frequency. Later it was named as "Tesla coil", perhaps the only Tesla invention carrying his name today.

The principle of induction coil is embedded in numerous electrical and electronic devices, like the automotive ignition systems that produce a spark when the car is started; the deflection systems that produce a high voltage for the analog TV receiver sets, and the electrotherapy equipment for the treatment of some kinds of diseases, etc.

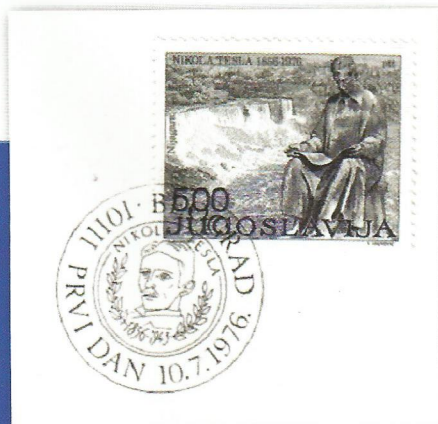
On July 30, 1891, at the age of 35, Tesla became an American naturalized citizen.

Tesla and Niagara Falls

In 1896, the first hydroelectric power plant in Niagara Falls started to run, transmitting three-phase alternating current to Buffalo through a power-transmission line.

In the process of designing and building up the generators and the system of transmission of electrical energy, nine of several Tesla's patents had been used. This event gave him a worldwide reputation as an electrical researcher and inventor.

To celebrate the scientist's 120th birth anniversary, Yugoslavia issued a Niagara



5d stamp (Scott No. 1308) and postmark, both issued by Yugoslavia on July 10, 1976, on the occasion of the inventor's 120th birthday. The stamp shows Nikola Tesla's monument in Belgrade (capital of the former Yugoslavia) at the right side, and Niagara Falls at the left side. The postmark depicts Tesla's portrait.



The 25h stamp issued by Czechoslovakia (Scott # 949) on December 7, 1959. It belongs to a set of six to honor inventors in the fields of telegraphy and radio. On the right side is Nikola's portrait; in the center, the electrical schematic diagram of the device; in the left side, electrical discharges and Tesla's lab tower at Colorado Springs, Colo.

Falls related stamp (Scott No. 1308) on July 10, 1976. Also note the other Yugoslavia stamp, above.

Tesla's remote control

Tesla was increasingly interested in transmitting electrical power over large distances without wires! During his research of wire-less transmission, in 1896 he developed and patented the basis for a system of radio communications (a four tuned circuits system). He also developed the remote-control (or radio-control), a technology that is used nowadays in cars, planes, boats and television sets controlled remotely without wires.

In 1898, Tesla demonstrated his first remote controlled boat model at Madison Square Garden. Inside the vessel there were "Tesla's coils" tuned to other coils on shore. Through them Tesla were able to direct the vessel. During the demonstration, astonished public (journalists and Tesla's financiers) were all the time searching for hidden cables!

The magnifying transmitter

From May 1899 until 1900, Tesla stayed at Colorado Springs, Colo., where, at a height of six thousand and five hundred feet (around 2,000 meters) above sea level, he built his new laboratory. There, as an improved version of the "Tesla coil", he constructed the largest coil ever built and named it as "magnifying transmitter."

Measuring 50 feet (around 15 meters) in diameter, it was a very big air-core "transformer" consisting of two coils (or windings): the primary, with a few turns of large diameter cooper wire, and the secondary, with many turns of small diameter cooper wire.



Ghana issued a sheet of eight called "Twentieth Century Inventors and Their Inventions" on September 1, 1998. This 1000c stamp (Scott No. 2062c) is part of a se-tenant pair. It shows the "magnifying transmitter" (a monstrosity built at his Colorado Springs laboratory) and Tesla in front of it.

For the budding collector of the Tesla topic, here are some references:

WEBSITES:

- Nikola Tesla Museum (in Belgrade): www.tesla-museum.org
- Tesla Memorial Society of New York: www.teslasociety.com
- Tesla Wardenclyffe Project: www.teslascience.org
- Tesla - 150 years of a genius: www.nikolatesla.hr

BOOKS:

- Cheney, Margaret, *Tesla: Man out of Time*, Laurel Publishing, 1983, 336 pages, ISBN-13: 978-0440390770.
- Cheney, Margaret & Uth, Robert, *Tesla, Master of Lightning*, Metro Books (NY), 2001, 184 pages, ISBN-13: 978-1586631871.

• O'Neill, John J., *Prodigal genius: The Life of Nikola Tesla*, Brotherhood of Life, 1994, 327 pages, ISBN-13: 978-0914732334.

• Foil A. Miller, *Nikola Tesla*, Philatelia Chemica Et Physica, the journal of the Physics on-Stamps Study Unit of ATA, summer 2007, whole number 114, pages 140-148.

This monstrosity was able to generate a high frequency, very high AC voltage at the output (around four million volts!). So, the apparatus was able to produce artificial lightning (sparks or electrical discharges). With his invention, Tesla claimed to have generated flashes exceeding 100 feet (30 meters) in length!

The Wardenclyffe Tower

Intended to act as a world wireless communications center, it was located near the town of Shoreham on the northern shore of Long Island in Suffolk country, and was constructed between 1901 and 1905. The tower was some 200 feet high with a 70 foot copper dome on top, where Tesla's "magnifying transmitter" was housed.

From there Tesla wanted to manage the transmission of wireless energy! However, he never finished his project due to the lack of funds. The erected, but incomplete, tower was destroyed by the U.S. Navy on July 4, 1917, due to security reasons.

Eccentricities

Among his several inventions, there are the arc lights for use in lighting public places. He also developed the first practical phosphorescent lamps (the precursors to fluorescent lamps).

As he got older, Tesla became more and more eccentric. He remained celibate and always preferred to dine alone. He became

increasingly germophobic, avoided shaking hands and washed his hands frequently.

Tesla was fascinated by number 3 and numbers divisible by 3: he used to walk around a block three times before entering a building, he always asked for three folded cloth napkins beside his plate during a meal, etc.

For the last ten years of his life Tesla lived in the New Yorker Hotel, located at the corner of 8th Avenue and 34th Street in Midtown Manhattan, New York city, on the 33rd floor (33 = 11 x 3), room # 3327 (3327 = 1109 x 3)!

Tesla's death

During an experiment on the first of January 1943, Tesla complained of chest pains and retired to his two-room suite at the New Yorker Hotel in Manhattan. He had had a heart attack and, after about six days, died privately and peacefully in his hotel room at the age of 86.

On the occasion of the "Conférence Générale des Poids et Mesures," held in Paris, in 1960, the great scientist was honored with the international unit to measure the "magnetic flux density". This unit was named "Tesla" and has the symbol "T" (figure 11). One Tesla equals to 1 Weber per square meter. The equation is the following: $T = Wb / m^2$. ☒

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