



# AN INTELLECT WITHOUT BORDERS

The patent record of **Nikola Tesla** is evidence of a restless mind that **respected few boundaries.**

Inventor Nikola Tesla won numerous patents during his life, most of which relate to electrical systems. His name is associated with motors, lamps, power transmission, and many other devices. Tesla's inventiveness crossed many disciplines, including mechanical engineering, as evidenced by the following Tesla patents.

In Patent No. 514,972 (1894), the electric motor of a rail vehicle is inductively powered by a wire buried between the train tracks. A conductive plate extends downward from the rail vehicle and is positioned closely adjacent to the buried wire. The benefits of such a design, compared to an overhead pantograph style power collector (invented in 1879) included lower electrical losses.

I came across Tesla Patent No. 613,809 when searching for historical unmanned

aerial vehicle patents for another Patent Watch column. According to this 1898 patent, Tesla was the first to remotely control a boat or other vessel. He demonstrated a radio-controlled boat at the Electrical Exhibition in Madison Square Garden in the same year.

Tesla won two patents in 1928, Nos. 1,655,113 and 1,655,114, for an aircraft which takes off and lands in a helicopter configuration and pivots once airborne to fly like an airplane.

Tesla Patent No. 1,329,559 (1920) is for a one-way valve with no moving parts. The internal geometry of the device permits a liquid to flow through a central channel in one direction. A series of diverters called partitions and curving channels called buckets reverses the flow coming from the opposite direction.

Patent No. 568,177 (1896) discloses an apparatus for producing ozone using another of Tesla's inventions, a high-frequency electricity generator.

Tesla also liked meters. Patent No. 1,314,718 (1919) is for a speedometer for a ship. Patent No. 1,365,547 (1921) is for a flow meter, which uses a Tesla turbine

immersed in the flow.

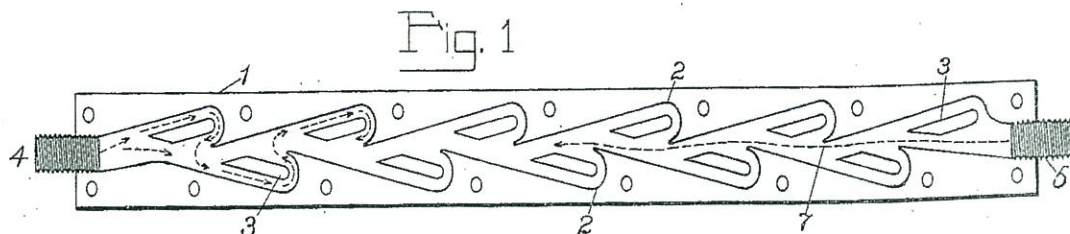
The Tesla turbine, which uses closely spaced parallel discs instead of blades, is itself the subject of patent 1,061,206, dated May 6, 1913.

Some of Tesla's inventions improved already existing technologies. For example, in Patent Nos. 514,169 and 517,900 issued in 1894, the inventor describes reciprocating engines that gain in efficiency by eliminating the conventional flywheel and replacing it with a spring.

Another involved a new kind of water fountain. In Patent No. 1,113,716 (1914), a large mass of water was moved upwards overflowing a funnel shaped conduit in the fountain.

The patent record proves that Tesla practiced in different disciplines well before "cross-disciplinary engineering" became a buzzword. Maybe he invented that too. **ME**

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Tesla 1920 Patent No. 1,329,559 is for a one-way valve devoid of moving parts. As shown in Fig. 1 of the patent, fluid can freely flow from fitting 5 to fitting 4 along pathway 7 but not in reverse due to "buckets" 2 and "partitions" 3.