

Tesla's Method

A Lightning Protection System (LPS) is designed to protect a structure from damage due to lightning strikes. Despite the many types of installation, we can clearly identify that they are two lightning protection philosophies that are based on principles diametrically opposite :

Tesla's Method – To avoid lightning formation (**Deionization**)

Franklin's Method – To attract lightning strike on lightning rod (**Ionization**)

Origin of lightning suppressor

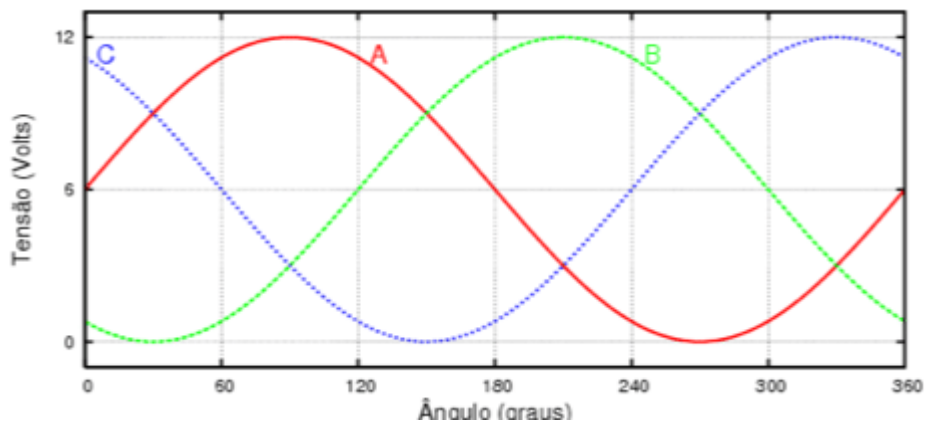
Nikola Tesla was an inventor and engineer in the 19th century.

Tesla is notoriously known for its leading role in the development and adoption of **alternating current** for the transmission and distribution of electricity.

He also created the **Tesla coil**, which produces high voltage at low current, high-frequency alternating current, and the world's first wireless remote control. Tesla was recognized as “the master of lightning.”



Nikola TESLA 1856 - 1943

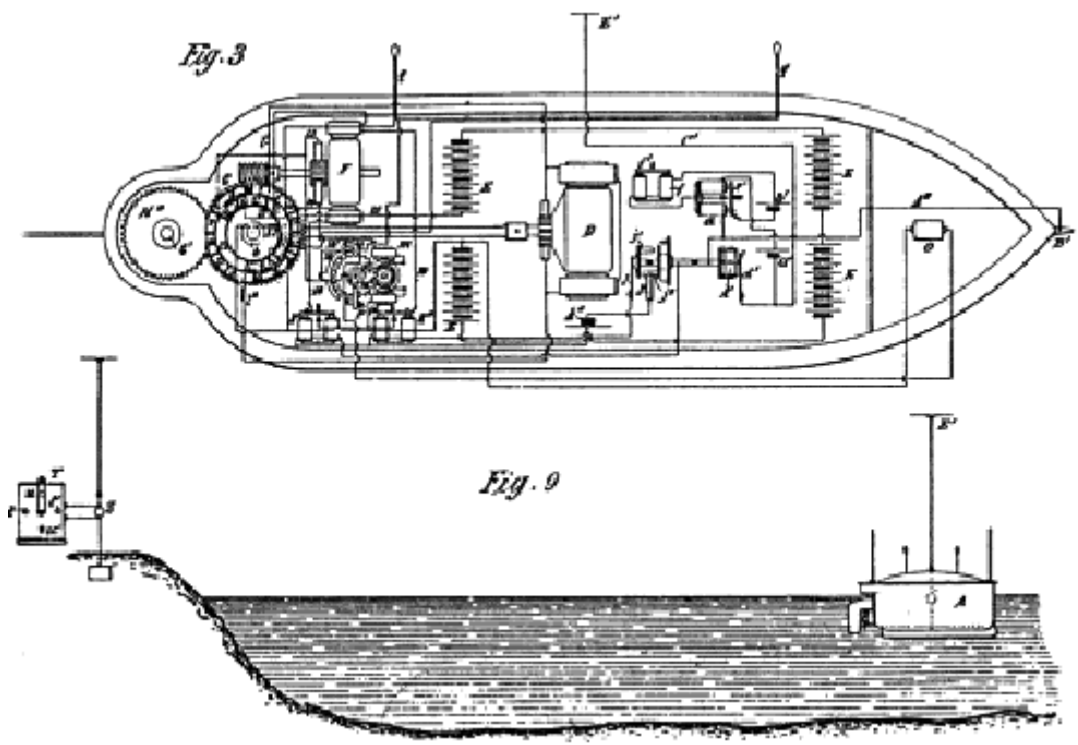


Alternating current

AC 1887-1888

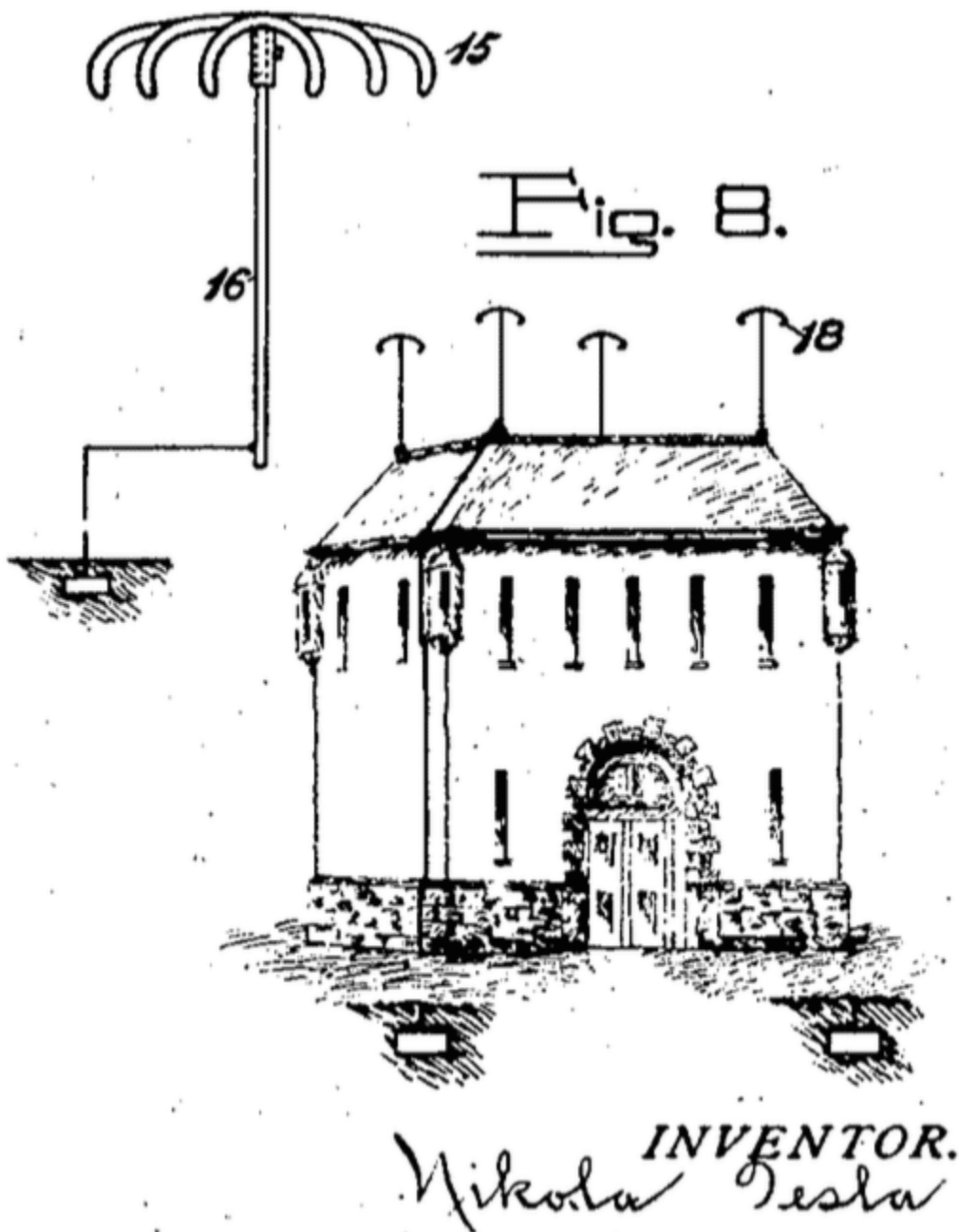


Tesla coil 1891



control boat 1898

Radio

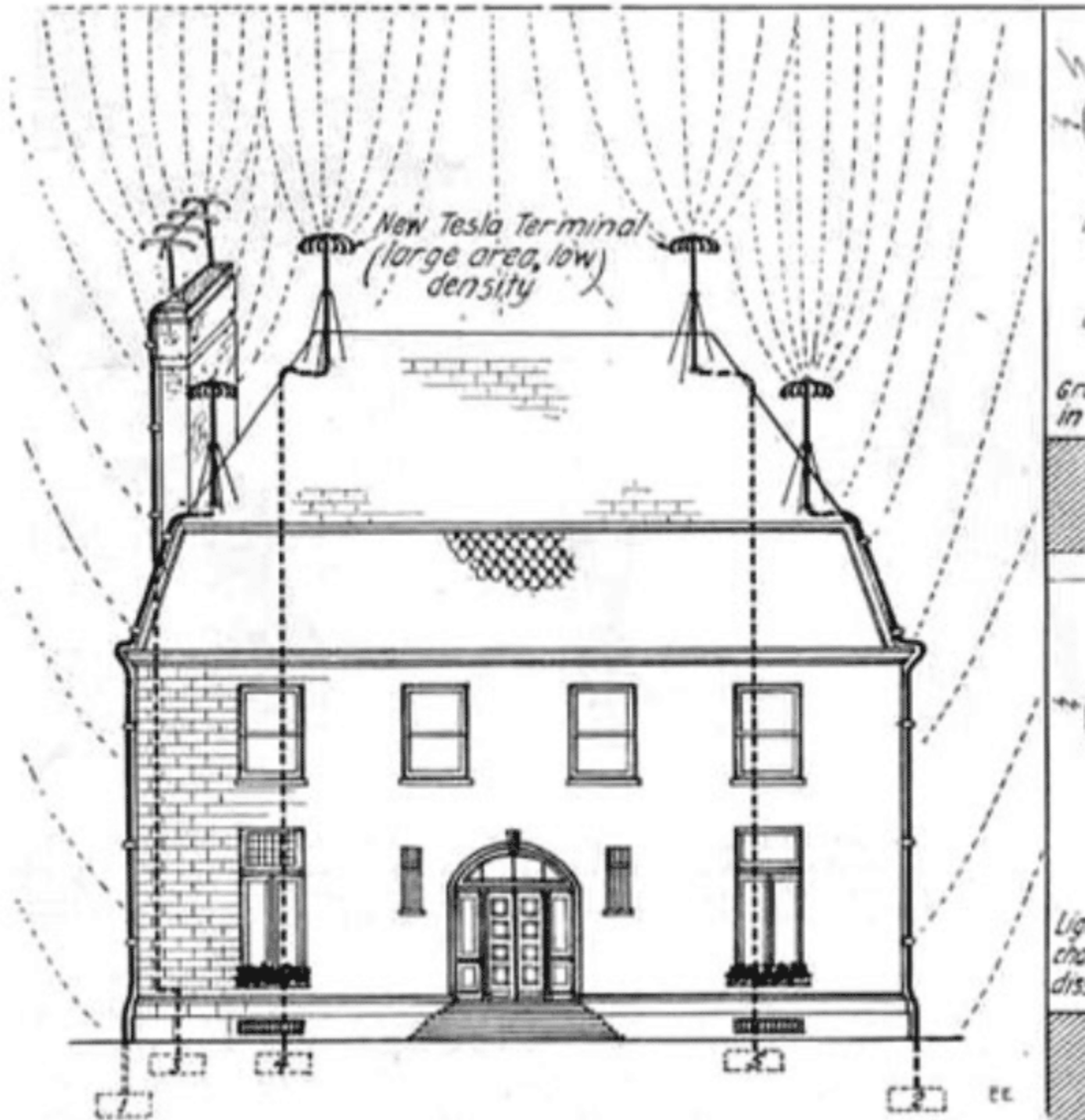


Lightning Protector 1916

LPS design by Tesla

In 1916, the brilliant inventor **Nikola TESLA** pointed out that Franklin's lightning rod greatly increased the risk of a lightning strike and decided to create "the lightning protector," which is founded on principles diametrically opposite by using a large round shape to secure **a very low density and preserves insulating qualities** of the ambient medium.

The Tesla's lightning protector was designed to regulate the electric environment, which prevents lightning formation.



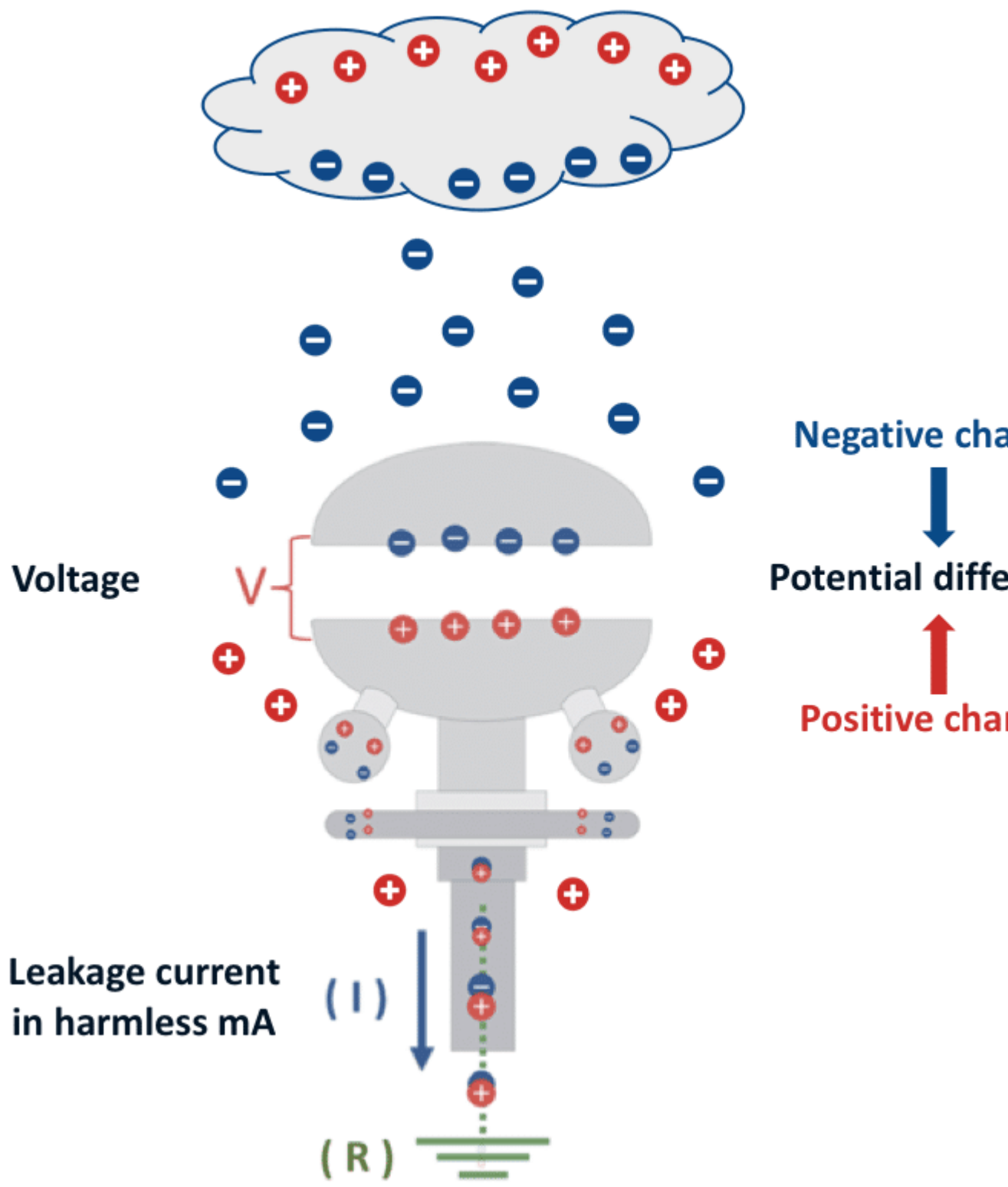
Nikola Tesla, Expert on High Frequency Currents, Such As Light, Recently Patented the New "Rounded" Form of Lightning Rod, Which is Superior to the Time-Honored "Pointed" Rods so Familiar to All of Us. A Reason For This Radical Departure in Lightning Protection is

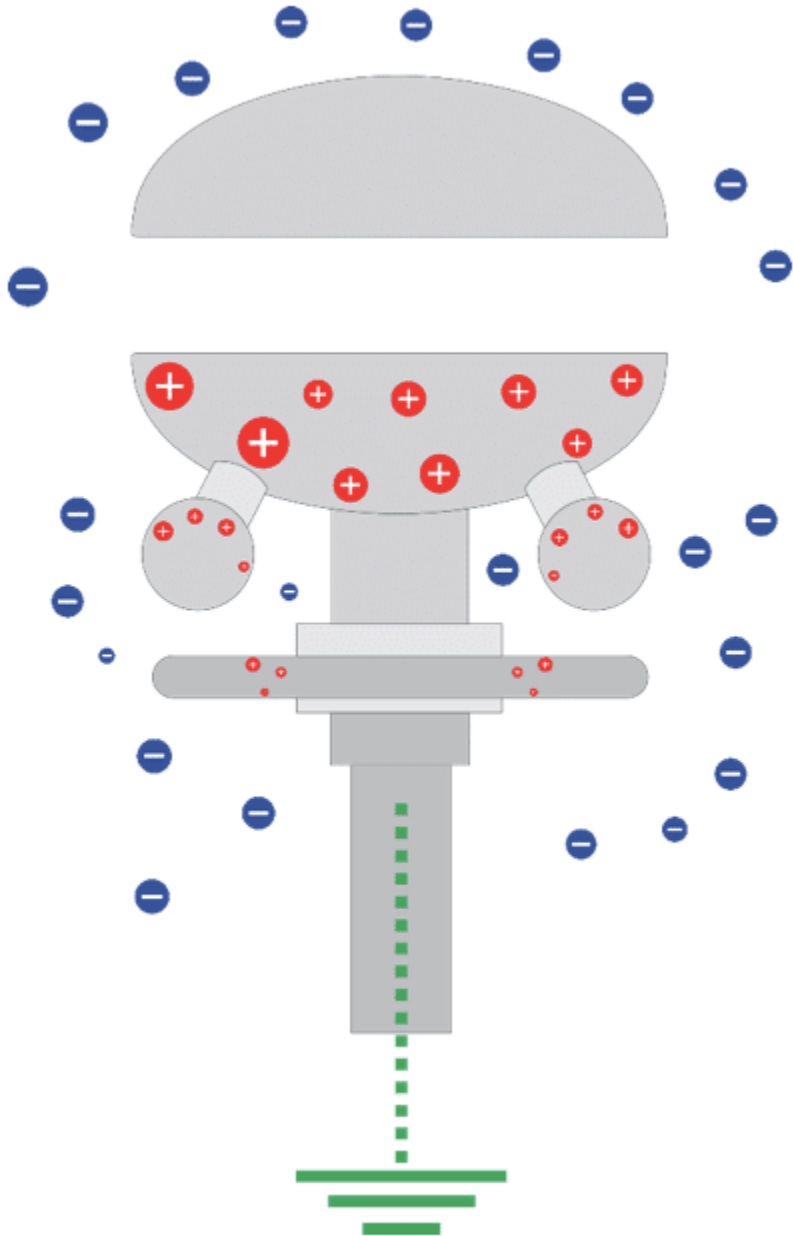
"Nikola Tesla, an Expert on High-Frequency Currents, such as lightning discharges, has recently patented the new "Rounded" form of the lightning rod, which he states is superior to the time-honored "Pointed" rods so familiar to all of us. Also, Dr Tesla has good reasons for this radical departure in lightning rod design."

Deionization step-by-step

The lightning suppressor CMCE has been designed following Tesla's principles to eliminate the potential difference between the ambient atmosphere and the protected structure.

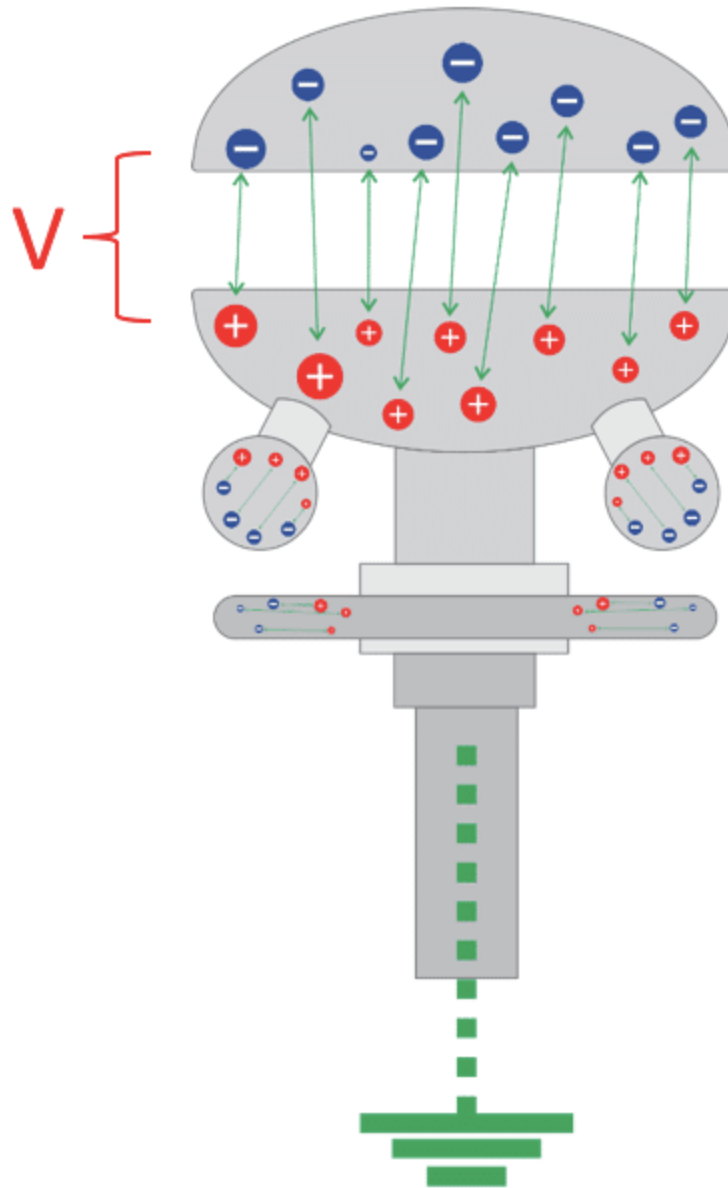
By absorbing and draining excess charges to the grounding system, the CMCE avoids the excessive concentration of opposing electrostatic charges, which prevents streamer emission and eliminates lightning formation in the protected area.





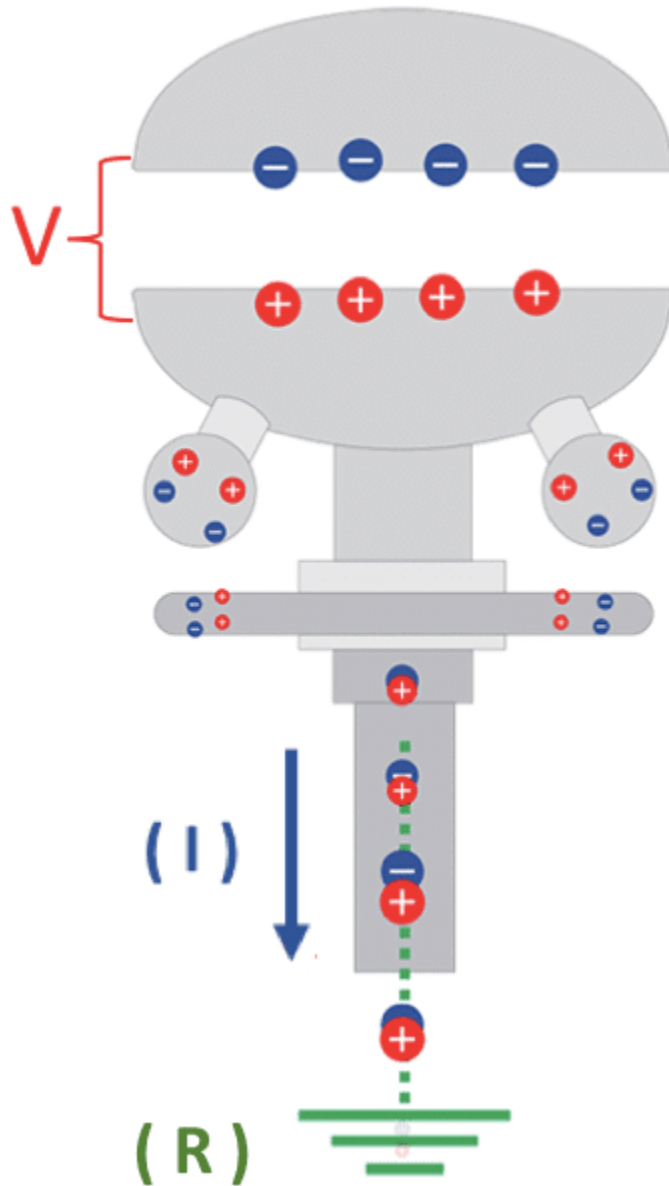
Step 1 :

Charges from the grounding system (positives) are distributed into the device from several earth electrodes. Charges from the opposite sign (negatives) are collected from other free electrodes.



Step 2 :

As charges of opposite signs attract each other, the system absorbs charges that appear in the surrounding electromagnetic field. The potential difference between 2 electrodes generates an electric voltage (V).



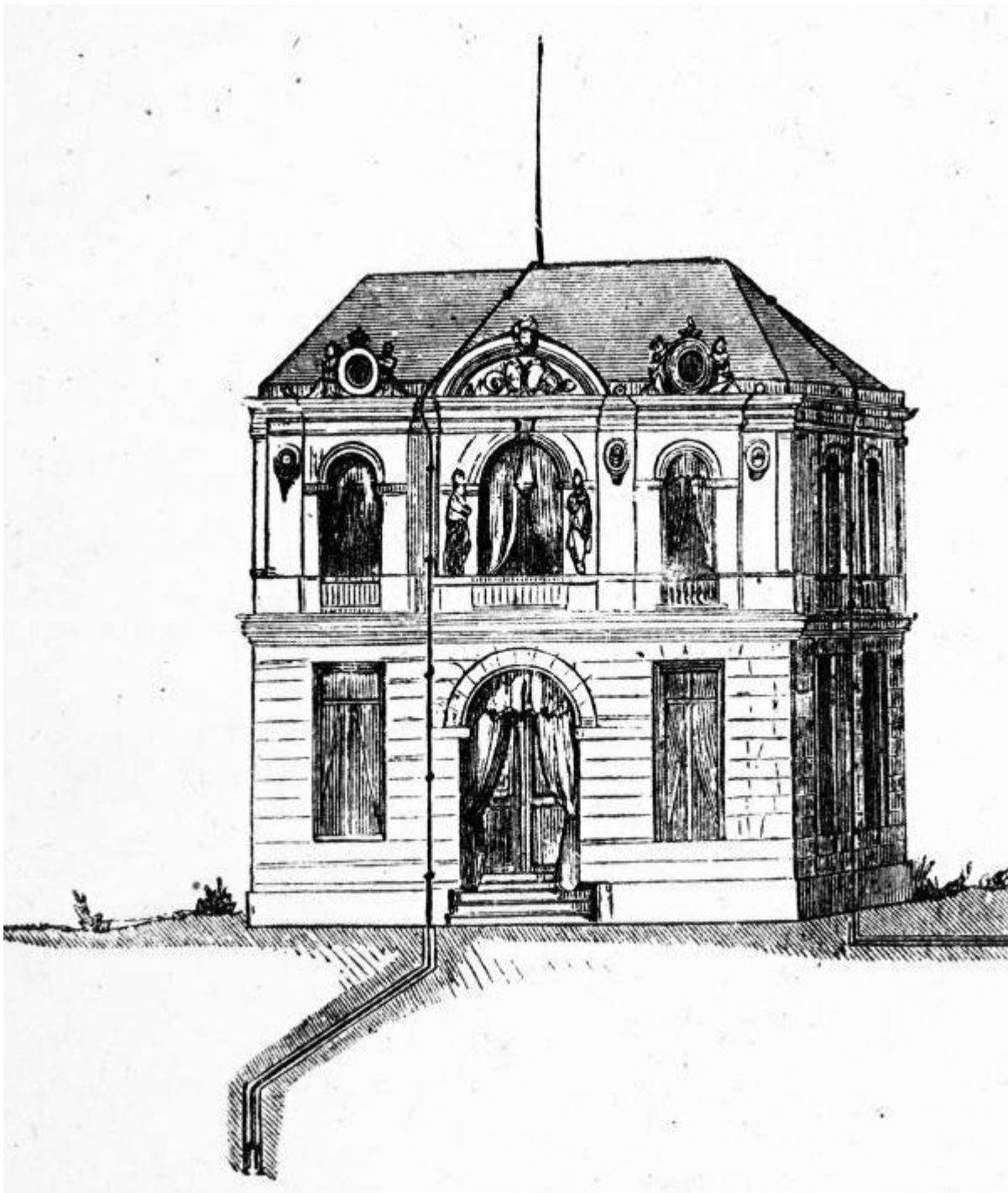
Step 3 :

The electric voltage (V) generated by the orderly movement of charges between the electrodes creates a controlled flow of leakage current (I) in harmless milliamperes.

Franklin's Method

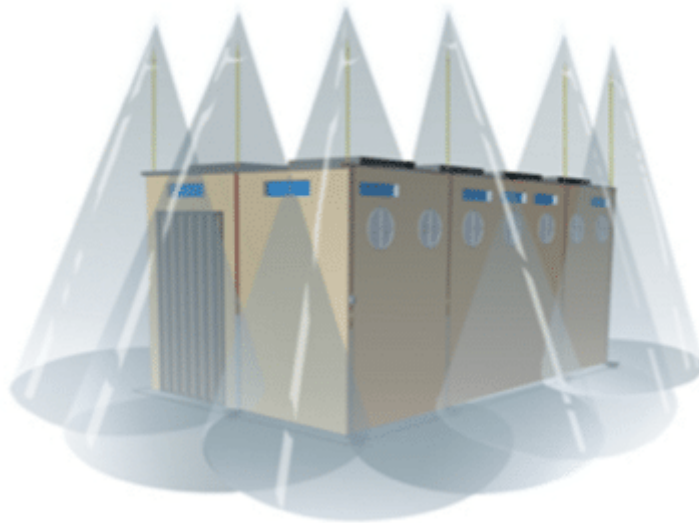
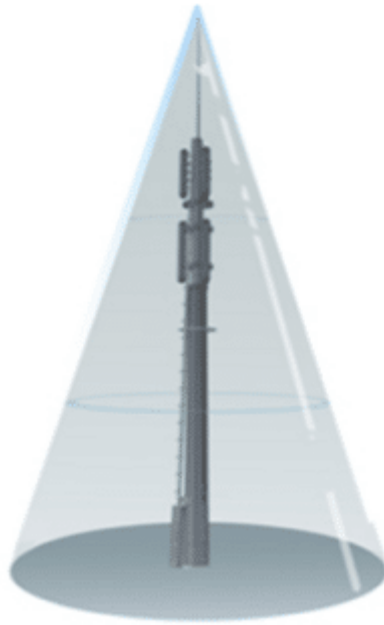
The pointed lightning rod conductor, also called lightning attractor or Franklin rod, was created by **Benjamin FRANKLIN** in 1752 as part of his groundbreaking exploration of electricity. Franklin, with the assistance of his son William, proposed an experiment with **conductive iron rods and wire to attract lightning** and conduct current to the ground.

The experiment aimed to demonstrate that lightning and electricity resulted from the same electrical phenomenon.



Lightning Attractor 1752 - Benjamin Franklin

Franklin's design to attract lightning :

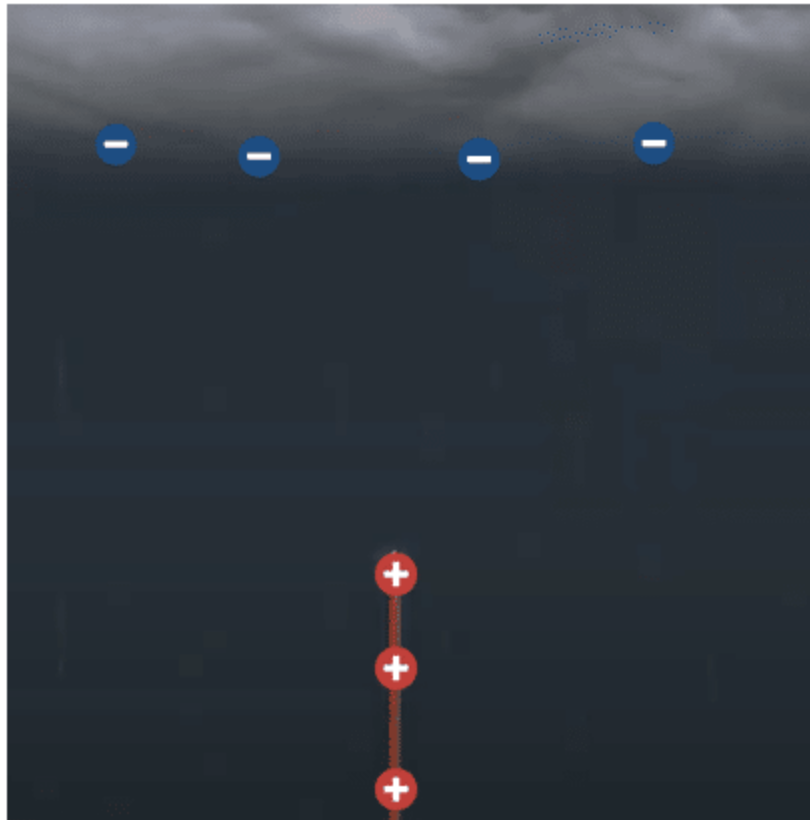


Conventional LPS use **Franklin's rods to attract lightning strikes on preferential impact points**; the lightning current flows through copper down conductors to the earth to dissipate lightning current (rolling sphere method, angle calculation method).

In 1836, Michael Faraday invented the “Faraday cage,” also known as the “mesh method,” which was formed by a continuous covering of conductive material.

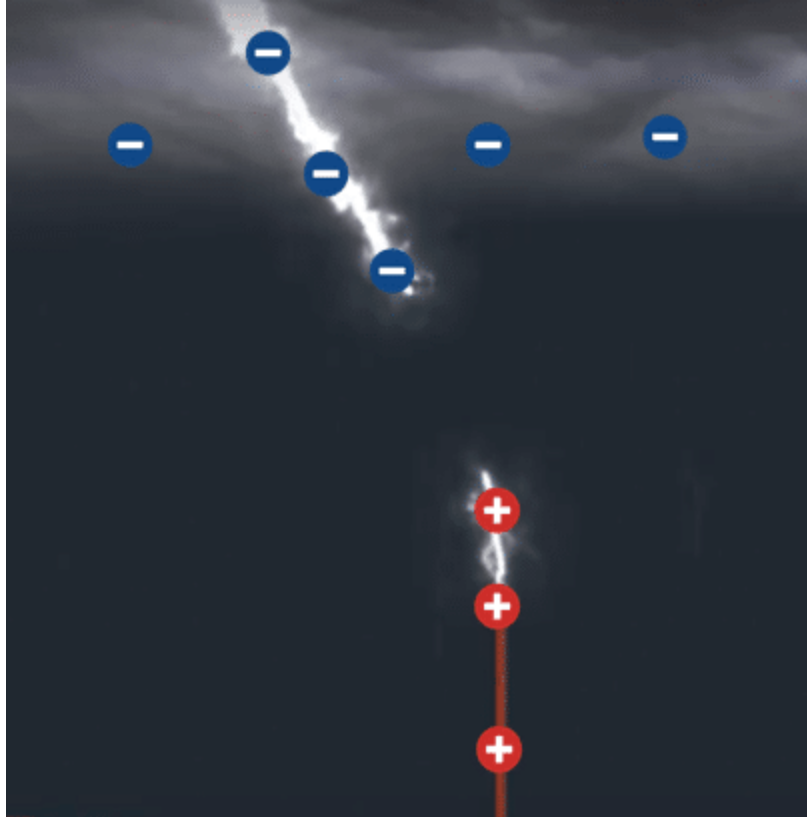
Many improvements have been made to increase the ionization phenomenon, especially with active lightning rods such as ESE, designed to increase streamer emission and capture lightning strikes on a larger radius.

Ionization step by step :



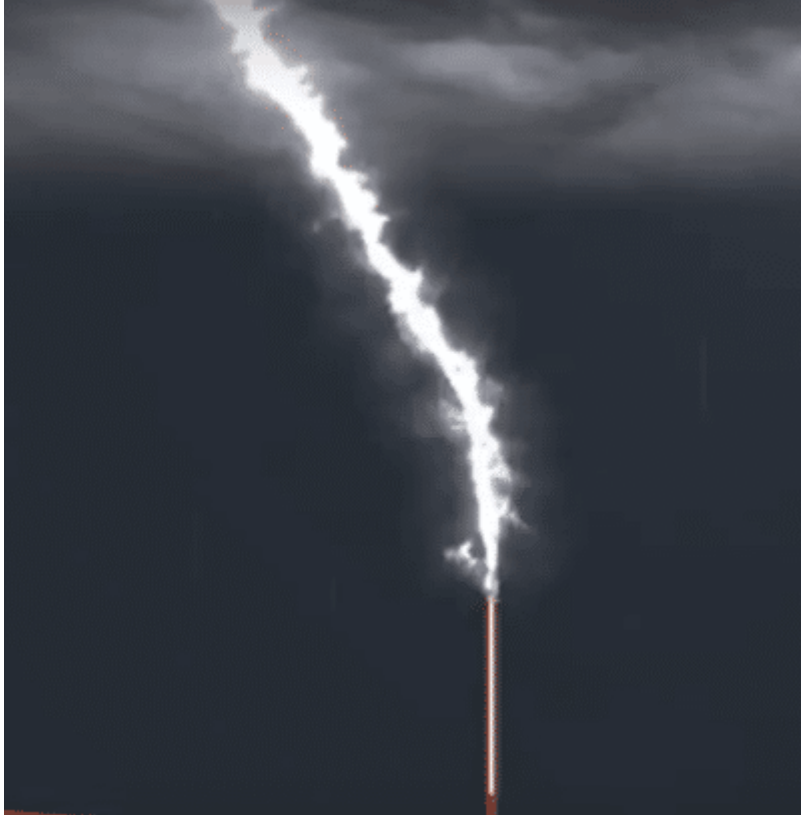
Step 1 :

When the atmospheric conditions change, the lightning rod collects opposite charges and brings them to its tip.



Step 2 :

The accumulation of charges will generate a streamer (leader) to collect lightning on its tip.



Step 3 :

The lightning current will flow through copper down conductors to join the grounding system to dissipate the lightning current into the earth.

Life is and will ever remain an equation incapable of solution, but it contains certain known factors.

