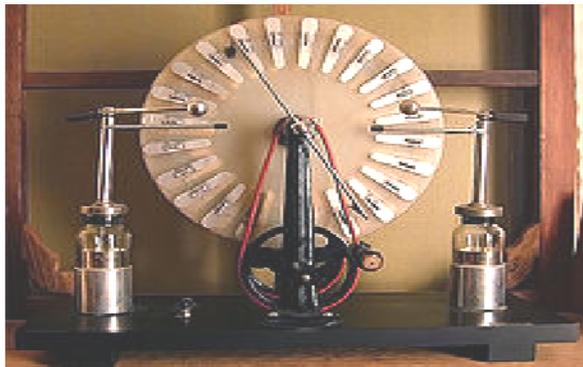


The Wimshurst Machine



One of the most common versions of the Wimshurst Machine, shown here with two glass Leyden jars.

What is a Wimshurst Machine?

Also known as the Wimshurst Influence Machine, it is a mechanically power device that belongs to a class of electrostatic generators called influence machines, which separate electric charges through electrostatic induction, or influence, not depending on friction for their operation.

Basically, the Wimshurst influence machine is an electrostatic generator and is used to generate high voltages without significant amounts of work.

When was it created?

The Wimshurst Machine was developed between 1880 and 1883 by British inventor James Wimshurst. But, earlier machines in this class were developed by Wilhelm Holtz (1865 and 1867), August Toepler (1865), J. Robert Voss (1880), and others.

The older machines were less efficient and exhibited an unpredictable tendency to switch their polarity. The Wimshurst did not have this defect.

How does it work?

In a Wimshurst machine, the two insulated discs and their metal sectors rotate in opposite directions passing the crossed metal neutralizer bars and their brushes.

An imbalance of charges is induced, amplified, and collected by two pairs of metal combs with points placed near the surfaces of each disk. These collectors are mounted on insulating supports and connected to the output terminals.

The positive feedback increases the accumulating charges exponentially until the dielectric breakdown voltage of the air is reached and an electric spark jumps across the gap.

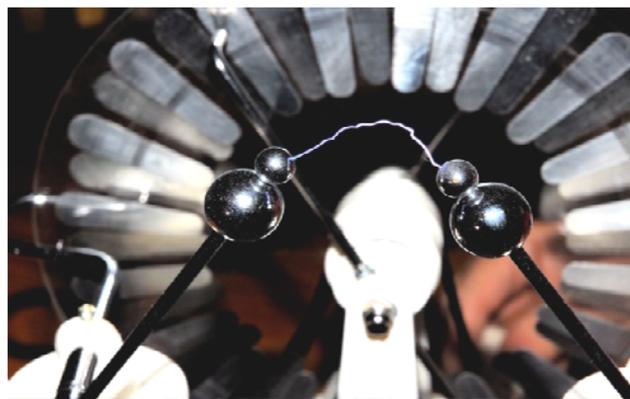
What science is involved?

There are three parts of the machine working at separate times, and shows the three ways of charging.

Charging by rubbing: The metal brushes rub against the metallic surface on the rotating discs causing static electricity, which is then sent to the Leyden Jars.

Charging by contact: Then the connecting crocodile wires send the charge to the Pendulum which is charged negatively and positively, as it is with the spheres.

Charging by Induction: The electrical whirls three arms spin between the two polar-charge spheres, causing it to rotate continually.



An electric discharge occurring when the glass plates rub against the metal brushes causing static electricity.

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Safety Precautions:

Static electricity can cause mild pain when it comes in contact when the skin. You should always be aware of where you place your hands when operating the machine.