Bernoulli's Principle and the AC Transformer

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Abstract. Officially the AC transformer involves no capacitor theory. It is explained purely as an electromagnetic device. A step-up transformer increases the voltage and decreases the current in the secondary circuit. The low current in the secondary circuit is desired in order to minimize resistive losses as it travels large distances across the countryside. Electromagnetic waves will oscillate perpendicularly in and out from the wires and cannot therefore be involved in the energy transfer process since they are moving in the wrong direction by ninety degrees.

So there is clearly some important feature missing from the explanation for electrical energy transfer. How does such a small current carry so much power and cause such a dangerous tendency to arc?

The answer lies in Bernoulli's Principle as applied to aether hydrodynamics. In the primary circuit, kinetic energy is high and potential energy is low. In the secondary circuit, kinetic energy is low and potential energy is high.

Bernoulli's Principle can be satisfied by using $1/2LI^2$ for the kinetic energy and $1/2CV^2$ for the potential energy. But this means officially introducing capacitance.

The enormously high pressure (erroneously referred to as tension) in the secondary wires and the tendency of the electric current to arc to Earth is evidence of a very high capacitance. It will now be suggested that capacitance is in fact the main factor involved in the lossless transmission of electrical power.

The 'Turns Ratio'

I. It is the 'turns ratio' of the secondary to the primary coil which determines the step-up or step down factor in an AC transformer, and electromagnetic induction explains the theory of how power is transferred from the primary coil to the secondary coil.

Lossless impedance can be both inductive and capacitative, and the space between each turn of a coil gives rise to a very definite capacitance. There is a tendency for the electric current in the coils to arc across the space between each turn. This tendency to arc is caused by vitreous aether pressure (vitreous charge) in the wires. It has got nothing to do with any build up of charged particles inside electrical wires. See 'Electric Arcing and Action-a-Distance' at,

http://www.wbabin.net/science/tombe27.pdf

So clearly, capacitance is playing a major role as regards the significance of the 'turns ratio' and as regards the propagation of this effect.

Bernoulli's Principle

II. Providing we ignore the rotational EM radiation losses (spin losses) that occur in the space between the two coils, we can equate the rate of exit of energy from the primary circuit to the rate of entry of energy to the secondary circuit through the power equation,

$$\mathbf{V_p I_p = V_s I_s} \qquad \textbf{(1)}$$

Where $\mathbf{V_p}$ is the primary voltage, $\mathbf{I_p}$ is the primary current, $\mathbf{V_s}$ is the secondary voltage and $\mathbf{I_s}$ is the secondary current.

Once we have accepted the principle that capacitance is involved no matter to what degree, we immediately obtain the right to involve the equation for potential energy stored in a capacitor. Together with the equation for the kinetic energy stored in an electric circuit we can construct a Bernoulli type energy conservation equation. Bernoulli's Principle is essentially another way of stating the law of conservation of energy. It is an irrotational principle that is applied to hydrodynamics, and since electric current can be modelled as the hydrodynamics of the vitreous electric fluid (the aether), then we can apply Bernoulli's Principle to the AC transformer in the form,

$$\mathbf{1/2C_pV_p^2 + 1/2L_pI_p^2 = 1/2C_sV_s^2 + 1/2L_sI_s^2} \qquad \mathbf{(2)}$$

after integrating equation **(1)** with respect to time. **C** is capacitance and **L** is inductance.

In a step-up transformer, the voltage in the secondary circuit is very high and the current is very low, so clearly the capacitative potential energy is much more important than the kinetic energy.

This potential energy is being propagated both inside the wires and in the space beside the wires in the form of a transverse linear electro-polarization wave. The main action will of course be where the elasticity is greatest, which is inside the wires.

The Electropolarization Wave

III. There is no official recognition in modern physics of the existence of an electropolarization wave (the stretch wave). However electrical power is clearly not being carried by electromagnetic radiation (The spin wave) because this only oscillates inwards and outwards perpendicularly to the wires. Neither can substantial electrical power in high tension cross-country cables be carried conventional electric current in the wire because this has been made deliberately small to minimize resistive losses.

The missing factor in AC power transmission can be adequately accounted for by the propagation of linear polarization of electric dipoles both inside the wires and in the electron-positron sea in the space beyond the wires, with the main action occurring inside the wires.

Conclusion

IV. Electric current can clearly take on the form of a free flow of charged particles (slide) or an elastic displacement of dipoles (stretch). The AC transformer is a device which can convert between slide and stretch. Slide is associated with kinetic energy whereas stretch is associated with potential energy, voltage, or pressure. Electrical pressure is erroneously referred to as tension but in fact the tension in the stretched dipoles is a reaction to the vitreous aether pressure which is ultimately caused by fine-grain centrifugal force.

The common link between these two kinds of electric current is the flow of vitreous aether which constitutes an electric field. The kinetic energy $1/2LI^2$ associated with this flow will result in resistive losses and the conversion of some of this kinetic energy into heat. These resistive losses are known as the I^2Rt factor and they can be minimized by the transformer.

When the electric field results in the linear polarization of dipoles, then we will obtain capacitative potential energy (pressure) given by the expression $1/2CV^2$.

The flow of pressurized vitreous aether can be compared to the flow of a pressurized gas in a pipe, however, in an electric circuit the pressurized vitreous aether can leak into the surroundings depending on the dielectric constant of the surrounding medium.

The dielectric constant is essentially a measure of the elasticity of a material or of the electron-positron sea. Centrifugal aether pressure is everywhere and the dielectric constant is a measure of how much aether can be compressed into a given material.

Hence in all matters to do with electric circuits, the junction between different kinds of materials is absolutely crucial in determining the equilibrium state that will ensue, because the junction involves a change in dielectric constant/elasticity.

If a circuit contains a segment which is not a conductor, then below a certain threshold of voltage which will depend upon all the dielectric constants involved, dielectric polarization will block the flow of vitreous fluid. Above that threshold, the vitreous fluid will flow, but charged particles will only flow in an electric circuit if the entire circuit is composed of conducting material.

The actual flow of charged particles which occurs only in conducting materials is important in that it acts as a pressure release that allows free electric current to flow at lower voltages. However in general, electric current does not need to involve the flow of charged particles. The flow of pure vitreous aether is sufficient in its own right to constitute electric current. Cathode rays are a flow of pure aether through the electron-positron sea but they differ from electromagnetic radiation by virtue of the manner of the interaction of this flow with the aether vortices that are associated with the electron-positron dipoles. The cathode rays approach the aether vortices directly and stretch them, whereas electromagnetic radiation approaches the aether vortices tangentially and angularly accelerates them.