Abstract

One concept that the everyday person takes for granted and do not really understand is the importance of energy and power. Power can be determined by the rate of work (energy) done on an object. In the same context, electrical power is the fundamental first step for any type of electrical technology to "turn on" and begin to execute its commands in which affects the daily life of every type of person. Nikola Tesla, a scientist of the 20th century, was given the nickname "The man who invented the 20th century" profoundly for his electrical inventions and contribution to the science and engineering fundamentals of power systems. Nikola Tesla presented three patents that introduced and discussed the phenomenon of wireless power transmission and his inventions that could potentially make this phenomenon possible. After reading each patent the interest to understand and experiment with the concept of wireless power transmission formulated this research topic. Therefore, this research topic seeks to understand and experiment with wireless power transmission by utilizing the Tesla Hairpin Circuit.

To be able to have a realistic and practical understanding of the concept of wireless power transmission under the parameters provided by the School of Engineering, I will be examining the behavior of the Tesla Hairpin Circuit is crucial as it is the small sample of how the Tesla Coils behave which can exhibit true wireless power transmission. The Tesla Hairpin Circuit is made up of a transformer, two high voltage doorbell capacitors, spark-gap, two copper pipes, and a copper shunt. The transformer increases the input AC voltage to the required amount to able to ignite and break the infinite resistance provided by the spark gap in which both capacitors are being charged. The phenomenon occurs on both copper pipes which are connected to both capacitors, respectively. Scientists, researchers, and engineers still debate what type of energy flows on the copper pipes because of its characteristics of being safe to touch and can power an energy receiving device such as a fluorescent tube bulb. Therefore, this research topic proposes

to build a physical prototype of the Tesla Hairpin Circuit, test the different theories that try to explain the phenomenon of the circuit on the prototype, and experiment with the prototype to achieve an understanding of energy produced by the Tesla Hairpin Circuit in which will lead to research the concept of wireless power transmission. Two conclusions will be made which are a theory of the energy phenomenon produced by the Tesla Hairpin Circuit and the understanding and demonstration of wireless power transmission.