CALIFORNIA STATE SCIENCE FAIR
2009 PROJECT SUMMARY

Name(s)
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Project Number
S0911

Project Title
Kinetic Energy through Induction: A Solution to Pollution

Abstract

Objectives/Goals
My objective is to prove that the property of electromagnetic induction can be applied to create a new method of powering transportation. Electricity would pass through a primary coil under the road surface, transfer to the secondary coil in the vehicle through induction, and power an electric motor in the car.

Methods/Materials
A model of this concept was built using an electric motor from a Lego train, a rectifier, a primary coil, and a secondary coil. The coils have iron cores and were wrapped with enameled copper wire. The motor, rectifier, and secondary coil were connected in one circuit. The variables being tested include the distance between the coils, the orientation of coils, the amount of voltage used, and the size difference between the coils. Data were measured by a digital multimeter, a ruler, a protractor, and a variable transformer.

Results
The primary coil provided the best transfer of energy to the secondary coil when the distance was minimal, the coils were parallel, and the length ratio between the secondary and primary coils was one. If voltage provided to the primary coil increased, then the induced voltage also increased. Thus, when certain conditions were met, the primary coil was able to induce the secondary coil to power the electric motor.

Conclusions/Discussion
Creating kinetic energy through induction worked and, under the proper conditions, enough voltage is induced in the secondary coil to cause the electric motor to run. Further testing is necessary to make the road surface longer in relation to the car, so that the technology can be realistically used. If this is possible, then this could be used to eliminate the need for petroleum in motor vehicles traveling on developed roads, powering them instead by electricity.

Summary Statement
Cars can be powered through induction using two separate electromagnetic coils: one imbedded in the road and the other inside the car powering the electric motor.

Help Received
I received help from my grandfather with the concept and with some construction of the model.