

CURRENT COUPLED COILS

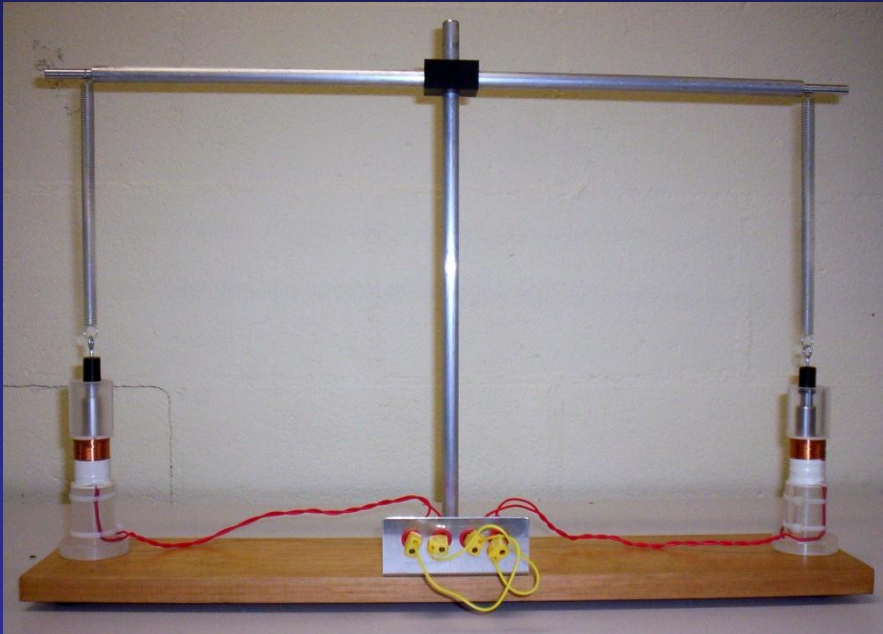
What to do

1. Push one of the magnets downward on the spring
2. Disconnect the wires and now push magnet

The induction coils are an example of Faraday's law, which describes the generation of voltage from changes in magnetic flux. This law is:

$$emf = -d\Phi/dt$$

Where emf is the induced voltage, Φ is the magnetic flux and $d\Phi/dt$ is the change in magnetic flux. This is the principal on which electrical generators are based, that convert mechanical energy to electrical energy. Transformers also apply Faraday's Law and are used to adjust the relative voltage between circuits.



The induction coils need to be placed some distance apart so that the magnets do not interfere with one another. One of the magnets on a spring is set into motion. The magnet moving up and down inside the coils produces a current in the coils. The current travels through the attached wires to the second set of coils. This current *induces* an opposing magnetic force in the second set of coils, which the second magnet responds to. The magnet contained in the coils moves in counterpoint to the first magnet; as the first magnet ascends the second magnet descends and vice versa.

When the wires between the two sets of coils are disconnected, the motion of one magnet does not affect the other. This is because the current can no longer travel between the coils and so the coupling of the two systems cannot occur.