

Two-Stage Mechanical Oscillator as Energy Input Amplifier

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Abstract:

This paper discusses the theory of a two-stage oscillator which acts as a mechanical amplifier. At first glance it looks like the law of conservation of energy is defied, however, it is just combining two energies, one from the pendulum itself and another one given by its motion. When the system is analyzed and efficiency is measured, usually the energy used to move the pendulum is regarded as the input energy without considering the energy of the pendulum. Because of that omission, the system can appear to defy the law of conservation of energy. To dispel any doubts that the law of conservation of energy is defied, the theory part will explain how the pendulum's energy is calculated. Then, both input and output forces will be measured using the prototype, to show that this method is using the law of conservation of energy. It is assumed that the pendulum is already in motion when given energy is applied to maintain its continuous movement. During the experiment, the first set of measurements is taken when the lever is in equilibrium and has no additional load, and the second set when the lever has a load equal to half the pendulum's weight.

Keywords:

Energy amplifier, mechanical oscillator, pendulum.