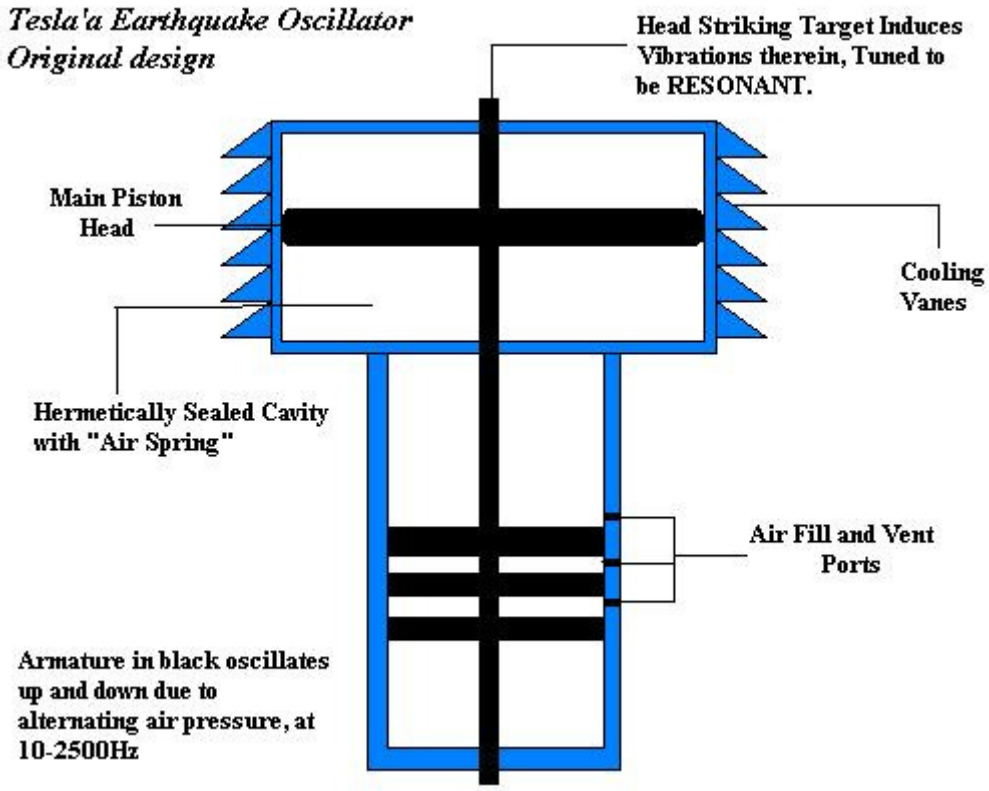
The Tesla Oscillator

Nikola Tesla is primarily thought of as an electrical genius, but he also was responsible for a number of mechanical devices. One of the most notorious of these was his *"Earthquake Machine"* otherwise known as the Tesla Oscillator. The machine which Tesla tested was small, around seven inches long, and weighing only one or two pounds; something "you could put in your overcoat pocket". In 1898, Tesla's New York lab was nearly shaken to pieces with this ittle device, operated by only five pounds of air pressure acting against a special pneumatic piston device. The whole assembly was designed to be powered by steam pressure.

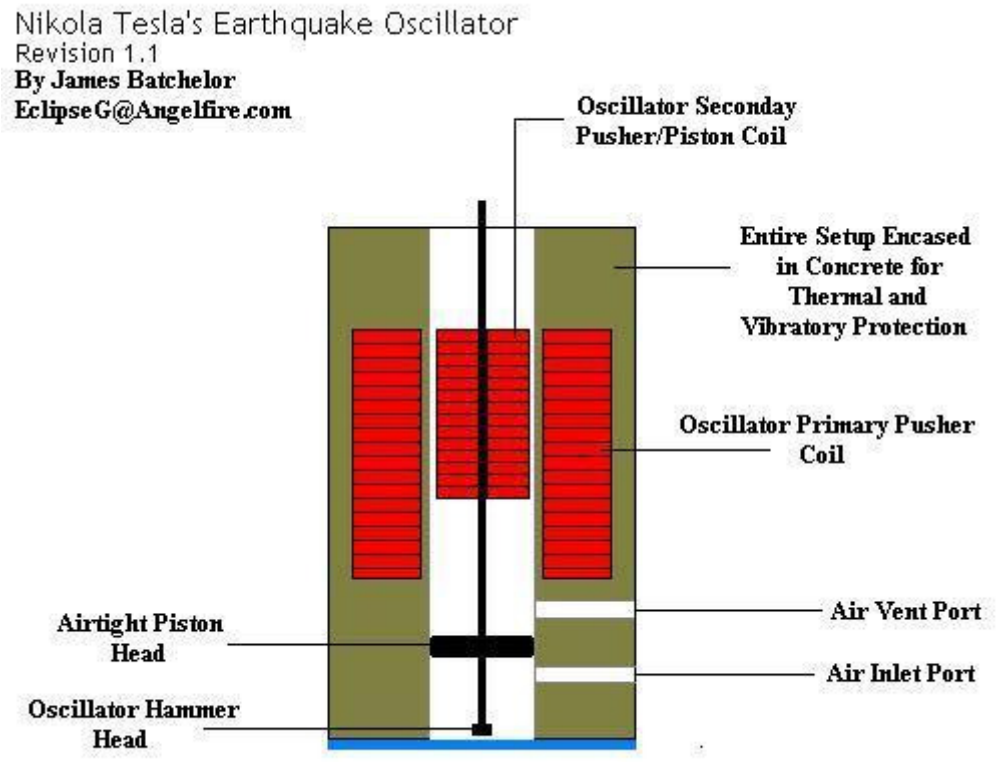
Tesla was experimenting with ways to transmit motive power *through the Earth!* Large versions of these oscillators, weighing perhaps 200 pounds, and being about three feet high could transmit usable motive power anywhere on te entire planet. As fantastic as it sounds, this device can also locate ships, submarines and buildings anywhere on a global scale. Tesla's device was purely mechnical, and is outlined below:



Steam would be forced into the oscillator, and exit through a series of ports, the net effect of which was to cause the armature to vibrate at high speed, within is casing. The casing was by necessity very strong, as temperatures due to pressure heating in the upper chamber exceeded 200 degrees, and the pressure reached 400psi. Other versions of the machine were created, designed to produce electrical power, both alternating and direct, (without the need for rectifiers).

The Plan

With this in mind, I began to think of a way in which I could build one of these oscillators more easily than with a steel pressure vessel. Since the air piston relies on compressed air to effect the oscillating motion, it seemed to me that another way of forcing the piston to move might be useful. I hit upon the idea of using a magnetic field to create part of the motion. Having variable frequency AC would be the perfect solution to this problem, allowing flawless tuning of the oscillation frequencies with a simple coil setup, without the need for air or steam at all. Eventually, the solution which best seemed to fit the job was the one below:



How it works is as follows. Compressed air entering the inlet port forces the piston head upwards. However, the piston shaft is impeded from moving upwards by the action of opposing magnetic fields between the two coils. The current in the coils can be varied to create a field of specific strength, and therefore amount of force required for the piston to rise. The field pushes down and the air pushes up. When the air push exceeds the field push, the piston will shoot upwards, but as soon as the piston head rises above the air vent port, the cavity will depressurise. When that happens, the field will slam the piston downwards, and the hammer head will strike the steel plate at the base. By varying the air pressure and magnetic field strength, any range of frequencies desired could be created.

Bringing the House Down!

Everything in nature vibrates at a certain frequency. When an object is vibrated at its natural resonance, it begins to undergo severe shock, as it tries to shake itself apart. It would be ludicrous to imagine that a tiny oscillator could by itself bring down a building, if not for the *principle of resonance*. Like a child on a swing, only a very small force is required to maintain a fairly large reciprocating motion. A major vibration could be established in a house by coinciding each stroke of the piston with the return of the individual vibrations through the building to where the oscillator is. Every time the piston hits, it magnifies the force a little more. At frequencies of 1000Hz, the force build-up can be very appreciable! The frequency of resonance is linked to the time it takes for the vibrations to spread out through the building, reverberate, and the "echoes" to return to the oscillator again. By finding the correct frequency, ANY structure can be destroyed. In fact, the larger it is, the lower the resonant frequency is, so the easier it is to destroy. Tesla once joked that he could split the Earth with one of these devices, and no-one ever knew if he was joking.....

Construction

I am presently considering constructing an oscillator to test, based upon my design on this page. The device is rather dangerous, so I will need to proceed with caution. If anyone has any suggestions of further improvements which could be made, please mail me.