Pressures within Reach

1. Detecting the infinitesimal - electromagnetic lever action
2. Ammonium nitrate - quantity over quality
3. Nitroglycerin and nitric acid - air, water, & high voltage
4. Shaped charges - copper corners & explosive pinching
5. Violent electrolysis, EMPs, and fusion - copper pipes & explosive induction
6. Force addition over time - standing waves & constant acceleration

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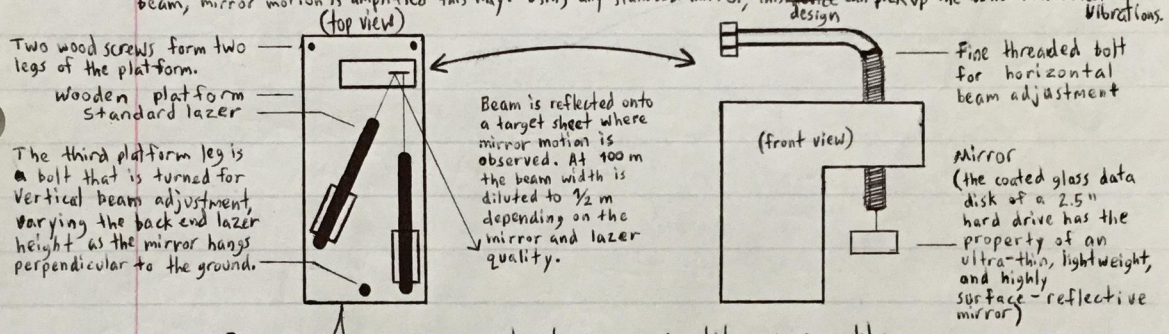
1. Detecting the infinitesimal - electromagnetic lever action

A lever long enough can yield movement approaching zero distance that can be used to apply infinitesimal pressure and travel. Inverse lever action involves the translation of slow movement into fast movement that is dependent on the lever length. In order to amplify infinitesimal pressure using a lever, the length of the lever must be significant and its weight - close to zero. Unfortunately, small forces cannot redirect long sums of matter. Light beams however, such as that of a lazer can be reflected and redirected with only the pressure required to ~~vibrate a~~ move a tiny mirror whose face diameter matches the lazer beam width. The length of the reflected beam determines the sensitivity. A ten meter flutter beam will detect the footsteps of a mouse and a hundred meter beam will ~~vibrate~~ as vehicles pass over a pothole at a distance. The purpose of the following design is to demonstrate photon momentum or that light has pushing force. The mirror is balanced and hangs glued to a very thin synthetic hair which allows the mirror to turn from the slightest pressure. The mirror remains motionless as long as both sides reflect an equal amount of beam light. Blocking the beam of the lazer on the right will cause the mirror to slightly redirect the other beam, mirror motion is amplified this way. Using any standard mirror, this ~~force~~ design can pick up the earlier mentioned vibrations.



2. Ammonium nitrate - quantity over quality

Ammonium nitrate is mostly used for blasting rock and farmland fertilization. It's a pearly white substance that is molten and solidified as spherical droplets for ease of handling, mixing, and molding. Its melting point is close to the decomposition temperature at which detonation can occur. A good test for ammonium nitrate is its endothermic reaction with water where it becomes cold. If exposed to atmospheric moisture for too long, ammonium nitrate begins to clump and stiffen. The following 95 to 5 mixtures are used for explosives.

95 % ammonium nitrate with 5 % aluminum powder.
95 % ammonium nitrate with 5 % diesel fuel.

High density means high effectiveness, tightly packing the explosives will increase the shockwave velocity. Carefully melting the aluminum mixture yields the highest density. The mixtures can be crushed and packed with high pressure, eliminating the space between the spheres. These materials are stable and difficult to set off. Typically, the projectiles of high powered rifles or a small device placed within the material that is to reproduce the pressure and velocity of that projectile is sufficient. The deterministic method involves detonators ~~and~~ or other high explosives.

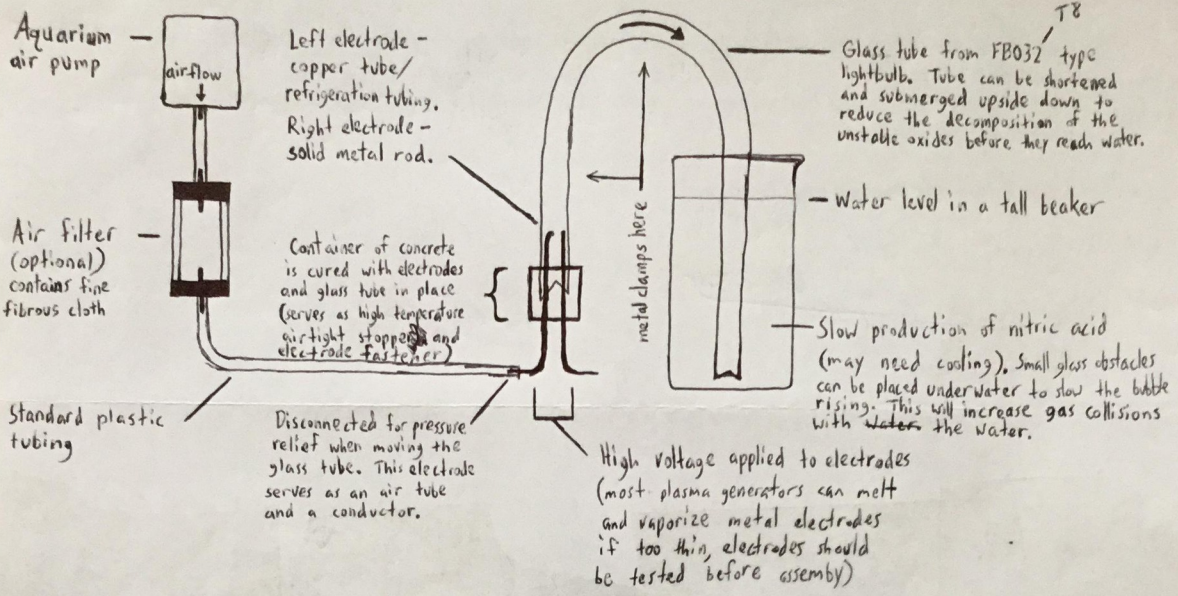
3. Nitroglycerin and nitric acid – air, water, & high voltage

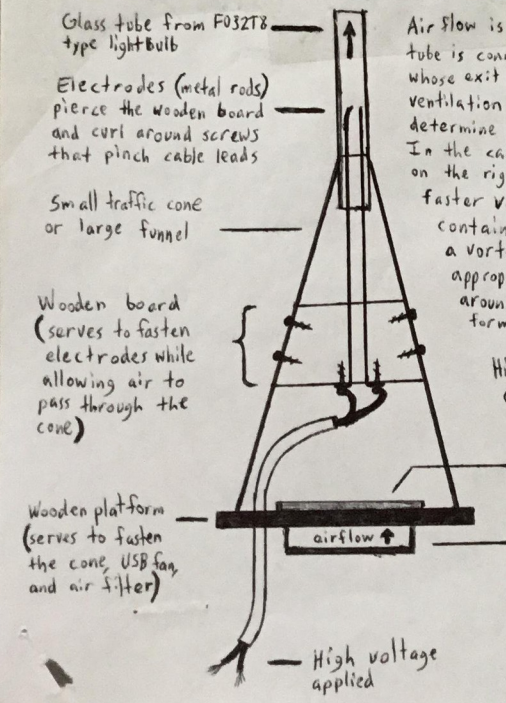
Nitroglycerin is mostly used as the active ingredient in dynamite, which is any absorbent material that has been wet with nitroglycerin. On its own, the substance is a slightly oily and discolored fluid. It's considered to be a high explosive that is dangerously sensitive to shock such as a hammer blow, dynamite would be the more stable and desensitized version. Nitroglycerin can also be set off with an electric discharge, whether its the instant metal vaporization pressure of a short circuit or the sudden high temperature of an electric arc between two electrodes. Small material samples should be tested with caution. Over very long periods of time nitroglycerin can escape the absorbent material and form sensitive clumps and concentrations. High explosives can be produced by carefully nitrating substances, dripping them slowly into concentrated nitric acid. If the nitration is exothermic which is usually the case, the acid would be set into a small bath of ice water to slow and control the reaction. Nitric acid can be produced in a glass container by mixing ammonium nitrate with concentrated sulfuric acid and leaving the mixture to chill for less than a day. The substance for nitration is ethylene glycol (antifreeze), preferably the concentrated version that is still to be mixed with water for use in vehicles.

Ammonium nitrate with sulfuric acid yields nitric acid.
Nitration of ethylene glycol (antifreeze) yields nitroglycerin.

Nitric acid can also be produced with air, water, and high voltage. The composition of nitrogen in dry air at ground level is 78 %. High temperatures and electric fields such as those produced by plasma generators can break down the air molecules where they randomly recombine to form other substances such as ozone and nitrogen oxides, nitrogen being the one requiring high temperature from the electric arc while oxygen requires only an electric field such as the purple haze between two electrodes that has the sharp scent of something like fresh snowfall. Electric arcs or plasma will of course break down both gasses. Ozone is created and destroyed in equilibrium: $O_2 \rightarrow 2O$, $O + O_2 \rightarrow O_3$, $O + O_3 \rightarrow 2O_2$. $N_2 + O_2 + 181\ kJ \rightarrow 2NO$. Nitrogen and oxygen break down and combine to form nitrogen oxides such as NO and NO_2. Some of these unstable and poisonous oxides combine with water to form HNO_3 (nitric acid). It is possible to construct simple apparatus for continuously passing electrified air through a glass container of water. In the first diagram, the air pump is placed before the high voltage electrodes in order to avoid the ozone, since ozone is the more active version of oxygen that can age rubber. The tube for submersion is glass to prevent melting since air electrification in a closed environment can get hot over time. This apparatus involves poisonous unstable compounds, oxidizers, strong acids, and high temperatures which are to be vented and handled with glass. Such a device can be used to grow plants effectively, plants require blue light, red light, and carbon dioxide for the greens and nitration for the roots. On its own, atmospheric nitrogen is useless to plants and dirt is not required. The process of introducing nitrogen oxides to water can be significantly sped up by misting the water and blowing electrified air into the mist. Plant roots can be misted with this water. Diagram 2 shows the simplest apparatus for blowing electrified air over the surface of water while forcing the greatest travel distance for gas–water contact. This method is faster than bubbling air and slower than misting water. Applying intense vibrations to the shallow containers will cause the water to bead into the air. Higher frequencies produce smaller beads, this helps mix and increase the water surface area.

Slow pressurized airflow





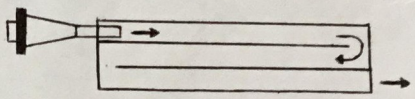
Airflow is pressurized when the tube is connected to a container whose exit hole diameter or ventilation pipes constrict and therefore determine the airflow rate. In the case of the vortex container on the right, higher pressure means faster vortex spin. Square containers can also produce a vortex if the cone is placed appropriately. Cones placed radially around the vortex container will form a vortex from the pressure alone.

High flow air filter (optional) consists of low density fibers. Intake filter assemblies from unwanted vehicles are fast filters of much higher quality.

USB fan (highly effective with unregulated full power such as that of USB power supplies and chargers)

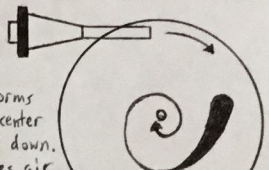
Maze container

(Top view, may need cooling)



Vortex container

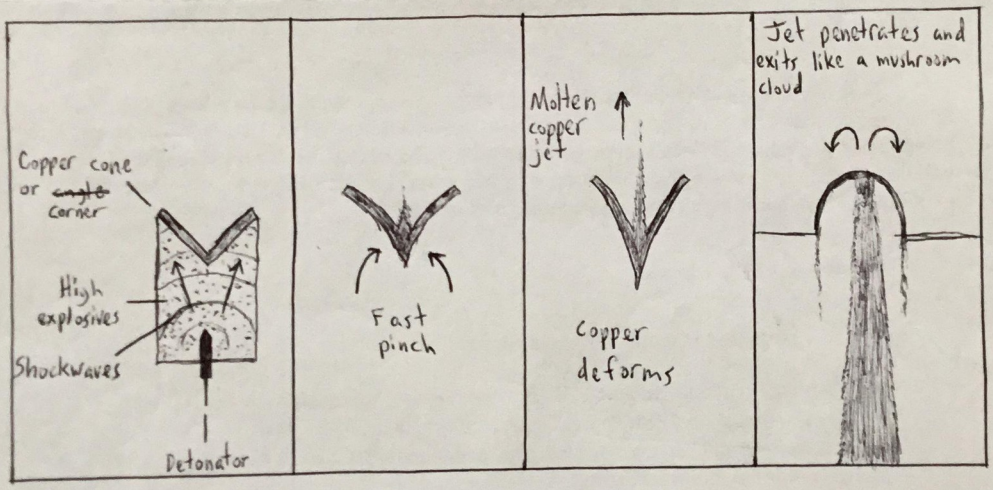
(Top view, may need cooling)



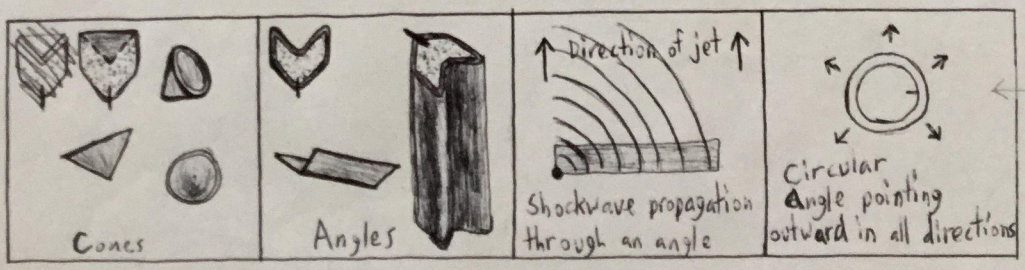
This container forms a vortex in the center that spins upside down. The vortex forces air to circulate over the water surface and prevents air from exiting too quickly upward through the lid hole in the center. Heavier compounds stay behind a little longer due to the centrifuge effect in the centripetal vortex. Multiple cones can be placed around this container for additional nitrogen oxides and centripetal force.

4. Shaped charges – ~~Copper~~ corners & explosive pinching

Shaped charges can penetrate and slice through many meters of solid steel. High explosives are used to accelerate projectiles of a clever shape and orientation where velocities are far beyond what is possible with explosive pressure alone. Consider the analogy of a slippery melon seed between two fingers. A light squeeze would shoot the seed across the room. Here, copper faces come together at high speed and the projectile is the material in between, the copper itself. Explosive pressure would pinch the copper fast enough to squeeze it out from between the faces and send a sharp molten jet that is faster than the collision of those faces.



~~Cones~~ Cones are used for piercing and ~~angles~~ corners are used for slicing targets. ~~Corners~~ produce a jet in the shape of a sheet. ~~Cones~~ are typically ten centimeters or about four inches in diameter, metal casings securely surrounding the explosives can increase the effectiveness by concentrating the shockwave onto the cones and ~~angles~~ corners.



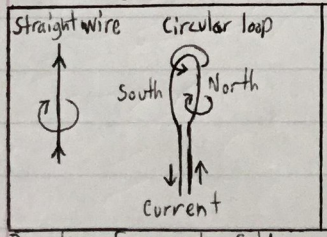
5. Violent electrolysis, EMPs, and fusion – copper pipes & explosive induction

The more energy borrowed, the less time to play with it.

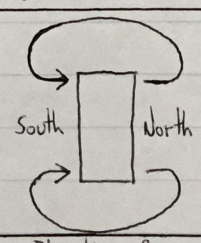
Explosively Pumped Magnetic Flux Compression Generators can produce extremely high currents and magnetic field densities. High explosives are used to deform copper cylinders interacting with electricity and magnetism. Potential chemical energy turns into kinetic energy, which then becomes current flow as electrical energy. And where there is a current flow, there is a magnetic field. The reverse is also true relative to a conductor, varying or moving a magnetic field will cause current to flow in that conductor. The Exploding generator is used to significantly amplify a given current. It is possible to chain these devices in series where one feeds another, however, a single generator of extra length and sufficient input current is effective for higher energy requirements. Daisy chains increase the complexity. Without high quality detonators and precision timing, explosive tubing is to be used where a single detonation source activates the entire device assembly. As long as the density of the explosives packed into the tubing is even throughout, the shockwave will travel at linear speed through the forks

The load can be replaced with a tube or container of water that is salted for conductivity. $2H_2O + 490\ kJ \rightarrow 2H_2 + O_2$. This can be achieved with electrolysis or high temperatures, the sudden flash of intense electricity running through the water can violently vaporize and break it down. A mixture of these effects yields an expansion ratio greater than that of water to steam alone.
1 kg of H_2O + 2,260 kJ → 1 kg of steam.

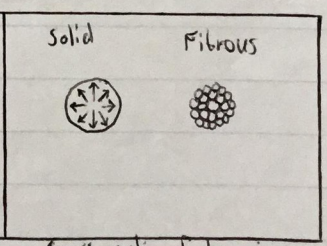
The load can also be replaced with a simple conductor or coil thick enough to handle the maximum current before that conductor is vaporized. An ElectroMagnetic Pulse from such a device is highly effective. Light is produced whenever a conductor experiences current flow or electric charge. Information is transferred by pulsating this light which is then absorbed as electron flow by another conductor such as a radio antenna. Any conductor can be an antenna, especially the wiring of tiny circuits which cannot handle the intense signals produced by the exploding device. The same can be said about magnetic fields, however, their densities are limited to a range and used only for close frying and magnetization leveling. Using these methods tiny electrical components can be damaged, vaporized, and magnetized. The exploding generator has the advantage of significant range.



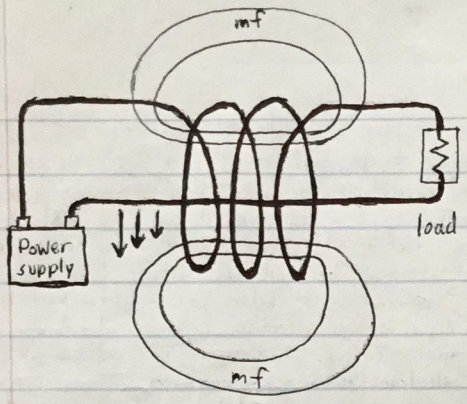
Direction of magnetic field in current carrying wires. The left hand rule states that if you wrap your hand around a conductor such that your thumb points in the direction of electron flow, your fingers curl in the direction of the magnetic field.



Direction of magnetic field in a permanent magnet

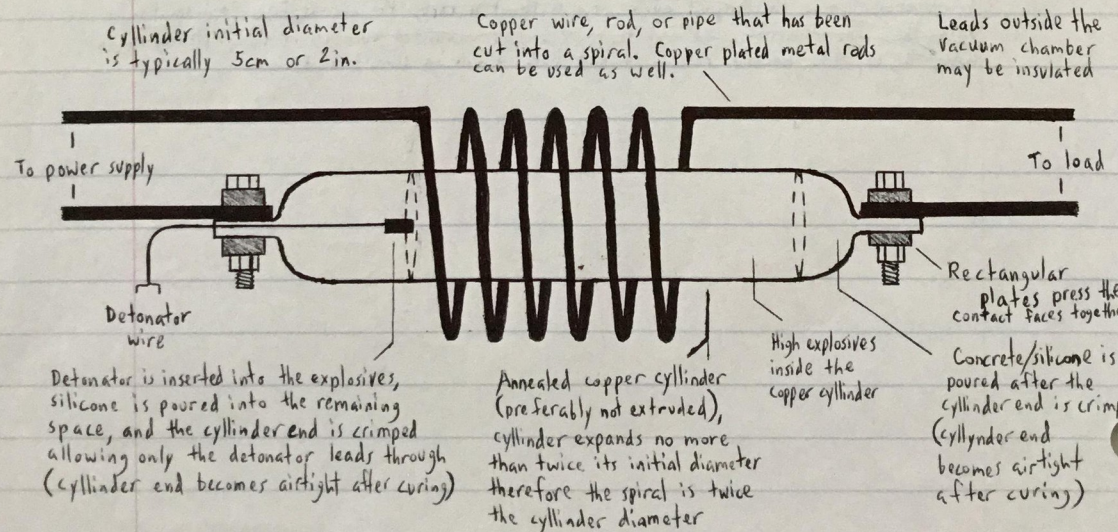


Cross section of two wires, one solid and one bundled or fibrous. The arrows represent electron flow in a wire. Since like forces repel, the electrons spread out and travel near the perimiter and out of the page. Fibrous wires are therefore more efficient due to the increased surface area.

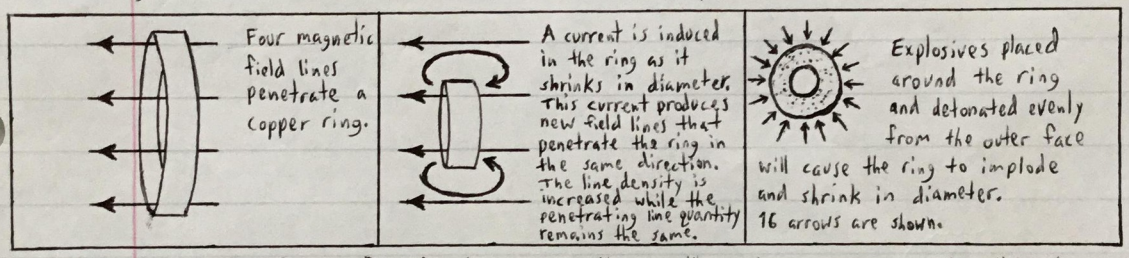


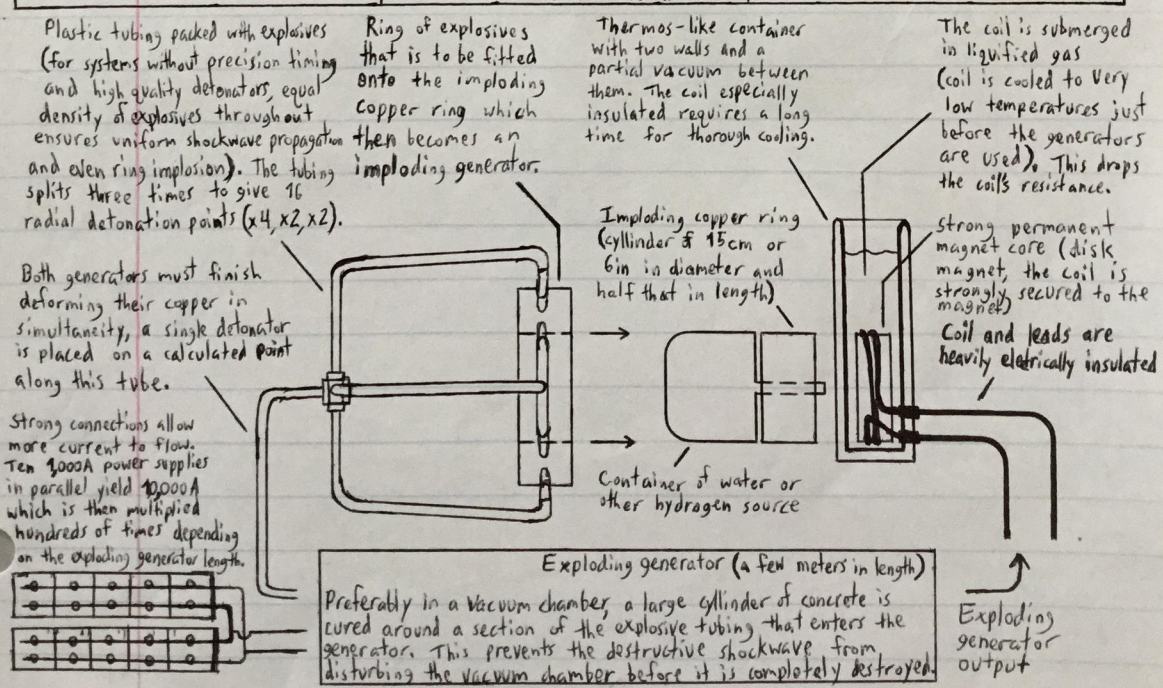
A simplified version of the exploding generator. The coil represents the spiral and the wire passing through the coil represents the expanding copper cyllinder. The magnetic field is supplied by the single circuit and the arrows represent that wire's movement which would be forced by explosives. Movement will induce a current in that wire. In the generator, this wire is replaced with a cyllinder that expands outward in all directions as if multiplying the number of wires passing through that coil. Once the wire contacts the coil, there is a short circuit and the existing magnetic field begins to collapse, that stored energy is released as electron flow back into the load. In this case, the magnetic field does not have time to collapse. Instead, the continued copper deformation will utilize the existing magnetic field to multiply the current in that wire. Faster movement means higher current hence the use of high explosives. The exploding cyllinder takes the shape of a cone and eventually makes contact with the entire spiral as the cyllinder expands from left to right.

The exploding generator's input current is applied a fraction of a second before detonation, this allows magnetic fields to reach maximum magnitude for that input current. The input is high amperage and low voltage, this also serves to prevent sparks and early discharging for devices not in a vacuum. The vacuum chamber is either a much larger non-conductive cyllinder that covers the entire device or a simple rectangular case. Explosives remain under one atmospheric pressure along with the small quantity of air that remains. The ~~cyllinder~~ copper cyllinder is airtight for the purpose of deforming the copper in a vacuum. The copper deformation is considered finished when most of the cyllinder has made contact with the coiled section. Capacitor banks or batteries can be used to supply the input current.



The Imploding generator is used to produce high magnetic field densities using a given magnetic field. These pressures are then used to produce high density allotrotes and new substances for study. Given a significant magnetic field input, it is possible to fuse hydrogen atoms. The exploding generator can be used to provide the imploding generator with a magnetic field by replacing the load with with a large coil of a few turns. Cooling the coil down to very low temperatures before the device is used and inserting a magnetic core for the coil will yield a density far beyond what is possible without these techniques. Air cores (the absence of a core) are considered faster than iron cores since raw iron takes work and time to align with an exterior field, a strong permanent magnet core will instead add to the field density and strength. The directions of coil and magnet flux are not to be in opposition. The normally active nature of the permanent magnet also serves to magnetically penetrate the imploding ring before the ring is deformed. The magnet is there to establish a sort of template of where the magnetic fields can be intensified as the exploding generator grows the input current. Without a core, the coil is free to dramatically vary the magnetic field spread and therefore induce unwanted currents in the imploding ring. Here, the exploding generator runs first and both finish in simultaneity.





6. Force addition over time - standing waves & constant acceleration

The audio recording of a ringing bell if played back to the bell, causes it to ring again. Notice that a single audio wave is nowhere near the strength of a hammer blow yet over time, the addition of constructive interference that compliments the previous influence has been seen to shatter glass, wobble bridges to the ground, and violently shake the earth. A small spinning weight offset for the purpose of generating vibrations can be securely attached to a bell or any structure where the energy is transferred directly to that object for efficiency. The effective frequency is called the resonant frequency at which objects "resonate" with the influential force. Depending on structural give and integrity, the resonant frequency may change as the constructive waves are applied. This requires the vibrator to adjust dynamically, periodically pausing the force application to measure the new object frequency.

Objects accelerating due to an external force are not expected to exceed the velocity of the accelerating force. Objects accelerating due to an internal force are expected to approach the speed of light. Constant force yields constant acceleration. Propulsion systems accelerate along with the object and continue adding force as the velocity changes. Such an internal force is not contained within the object, as propellant must leave the system. Every action has an equal and opposite reaction. The faster a propellant leaves the system, the more force is applied and acceleration becomes efficient. In the case of artificial satellites a heavy gas is expelled at extremely high speed, one particle at a time. Some particle accelerators have given a single proton 50% the speed of light. The energies inside a particle accelerator and the joining of two black holes are some of the most energetic events in the universe. A small object traveling near the speed of light has enough kinetic energy to completely disintegrate a planet.

not verifiable

$e = mc^2 \rightarrow e = m \rightarrow m = e \rightarrow$ A small mass is a large quantity of energy

Pressures Within Reach is part of the ~~P&C~~ compromise-evident works collection.