REVOLUTIONARY NEW U.S. PATENTED HOT HYDROGEN FUSION POWER REACTOR

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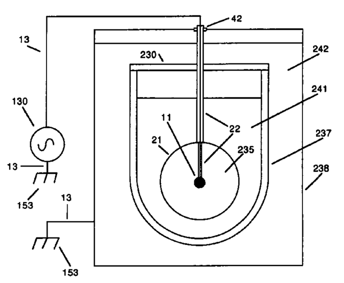
PATENT AND OPERATION

U.S. Patent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(54) APPARATUS FOR HOT FUSION OF FUSION-REACTIVE GASES

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Related U.S. Application Data

(60) Provisional application No. 60/311,453, filed on Aug. 8, 2001.

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(52) U.S. Cl. 376/100; 376/107; 376/150

(58) Field of Classification Search 376/100, 376/107, 150

See application file for complete search history.

(56) References Cited

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Primary Examiner — Ricardo Palabrica

(57) ABSTRACT

A generally spherical sealed reactor vessel defining a volume. A target sphere shaped electrode 11 is centered within a nonconductive reactor vessel 21. The target sphere is insulated from and fixedly centered within the nonconductive reactor vessel by an insulated stalk 22. This vessel is suspended in an insulating and cooling medium 241 composed of transformer oil. Deuterium gas 235 is released into and contained within the volume at a predetermined pressure. A source of high voltage, high frequency potential 130 is connected to the target electrode by an electrical connection 13. The other terminal of the high voltage, high frequency potential source is connected to Earth ground 153. The applied alternating electrical potential creates an alternating electrical field within the reaction chamber. This an oscillating electric field is formed within the enclosed space of nonconductive reactor vessel 21, extending between target electrode 11 and heat absorbent container 238. This electric field is of sufficient intensity to provide for the ionization of gases contained therein. It also provides for the alternately radial outward acceleration and the alternately radial inward acceleration of the contained ionized gases. The collapsing of ionized gases provides for ions impacting the spherical target, and for the impact of ions with one another. The intensity of the electric field is sufficient that such impacts occur at fusion reactive velocities.

20 Claims, 7 Drawing Sheets

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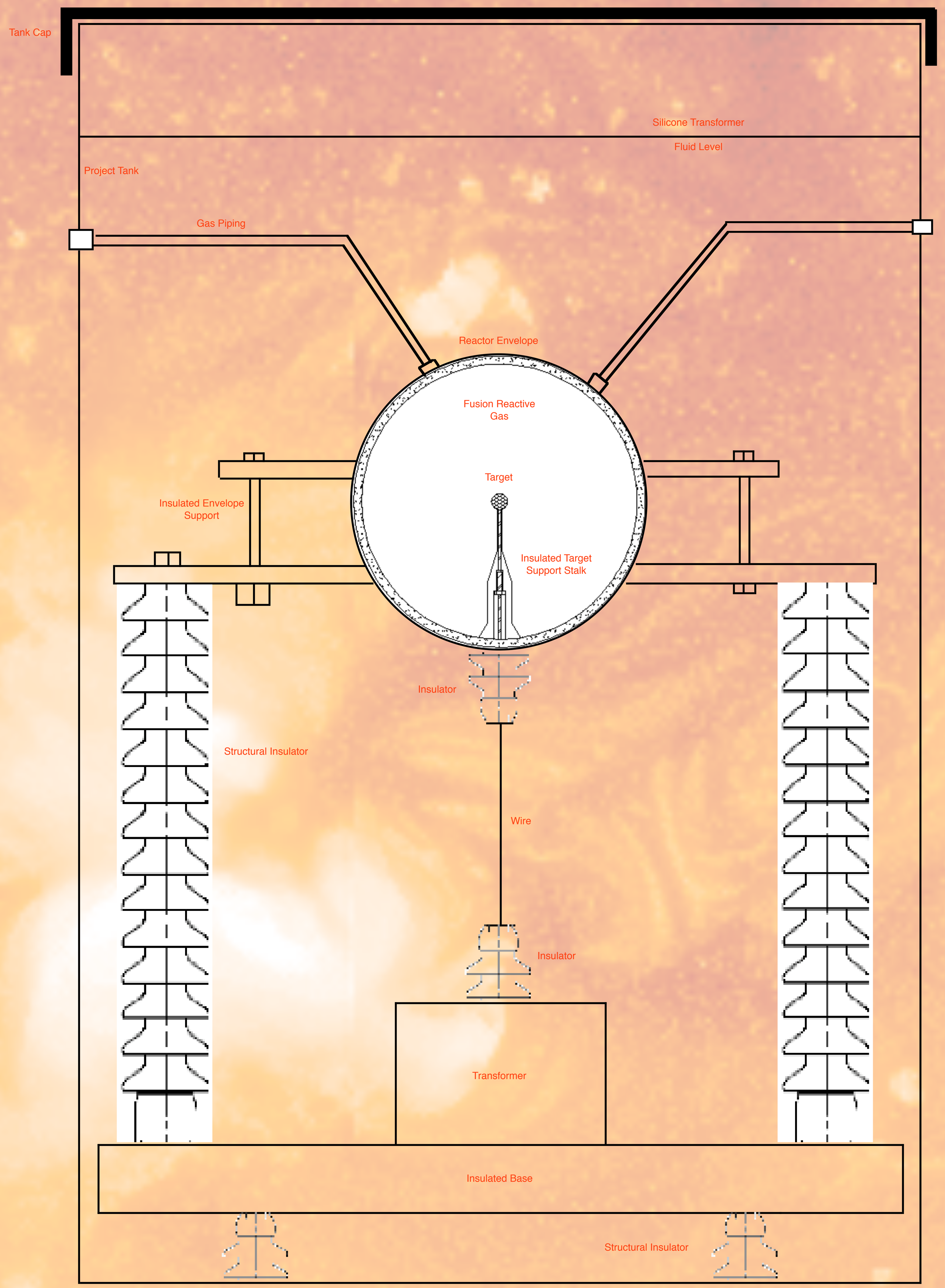


HOW IT WORKS

A. INTRODUCTION.

A spherical reactor vessel filled with rarefied deuterium gas contains a central titanium target. A high voltage AC potential is applied between this target and the external ground plane. The intervening material comprises thermal and electrical insulation. See Figure in abstract at left, and figure 2 at lower right.

The applied AC potential creates an oscillating electrical field within the reactor. The process sequences through steps. Neutral gas. Ionization. Inward positive ion acceleration with concomitant outward electron acceleration. Inward acceleration of positive ions to target at fusion reactive velocities. Disassembly of the reacting mass. Recombination of electrons and positive ions to neutral gas. Extraction of waste gas and injection of fuel gas. Continuous repetition of this sequence.

B. NEUTRAL GAS

See Figure 3.

C. IONIZATION

The gas is ionized with initial differential acceleration of charged particles. Positive charged particles are radially accelerated inward towards the target with electrons accelerated outwards. A net current still flows through the capacitor comprised of positive and negative charge carriers. See Figure 5.

D. INWARD POSITIVE ION ACCELERATION WITH CONCOMITANT OUTWARD ELECTRON ACCELERATION

Increasing potential continues acceleration of charged particles. Negative, low mass electrons start collecting at the inner surface of the reactor envelope defining a region of potential intermediate between the ground plane and the target. This forms the two innermost plates of an AC capacitive voltage divider. Current through the capacitor is decreasing as electrons accumulated along the inner surface of the reactor envelope. See Figure 6.

E. INWARD ACCELERATION OF POSITIVE IONS TO TARGET AT FUSION REACTIVE VELOCITIES.

Electron capture at the inner layer of the reactor envelope is complete. The capacitive voltage divider is fully formed and it's intermediate equipotential voltage layer continues to increase with increasing power applied by the power supply. The current flow through this capacitor is at it's minimum due to charge carrier depletion by the collection of electrons along the inner surface of the reactor envelope. The innermost capacitor has the smallest value, therefore the greatest potential develops across this region. This is the acceleration potential for the positive ions. This potential reaches sufficient magnitude for inward acceleration of positive ions to the target resulting in fusion reactions. See Figure 7.

F. DISASSEMBLY, ION RECOMBINATION, FUEL & WASTE EXCHANGE, CONTINUOUS REPETITION.

Reaction occurs when the voltage potential across the inner capacitor exceeds a threshold value. Reaction continues for this fractional duty cycle of the AC alternation. As the potential decreases below threshold, the reacting mass disassembles and reactions stop. On potential reversal, charged particles are accelerated in reverse directions and ion recombination occurs forming neutral gas. Fuel, catalyst, and waste gases can be exchanged at this time. The process can continue, cyclicly repeating as long as the drive potential and reaction conditions persist. It can cycle continuously. Cycling gives stability and controllability to the process.

See U.S. Patent US 8,090,071 B2 for further operational details and drawing references.

Figure 3

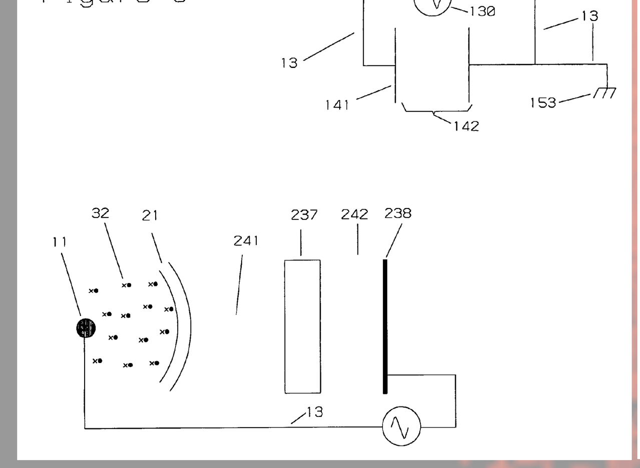


Figure 5

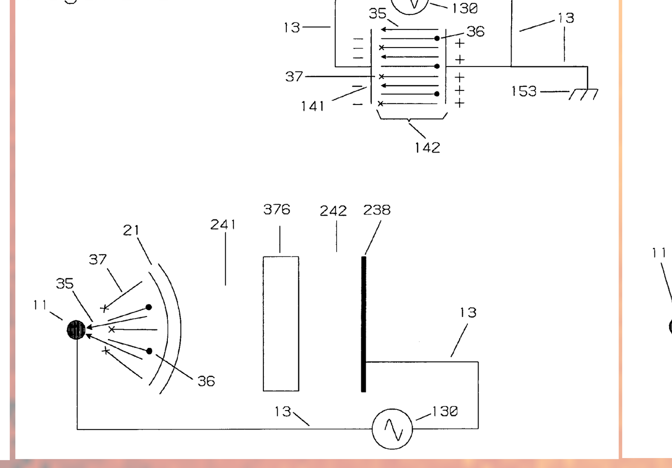


Figure 6

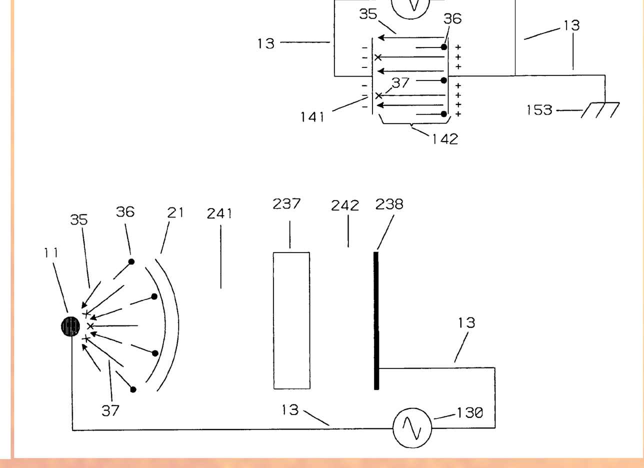
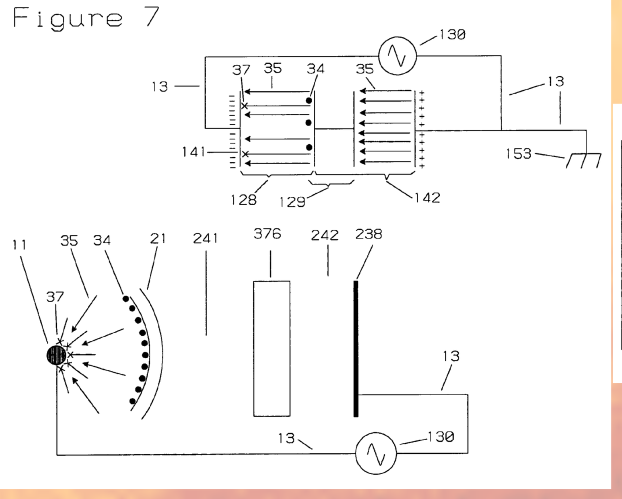


Figure 7



EXPERIMENTAL PROJECT

300 WATT PROTOTYPE EXPERIMENT

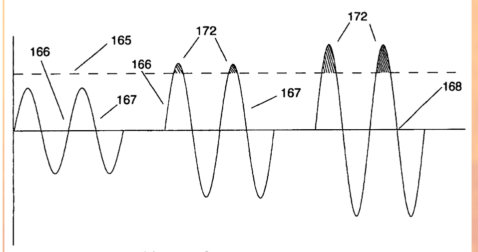


Figure 2

WHAT FUSION MEANS

I. Unlimited Sustainable Power

Fuel to operate a 2.25 GW power plant for one year:

360 gallons of water.

22.5 x 10^6 barrels of oil.

4.5 x 10^6 tons of coal. Ref 1.

Diablo Canyon 2.25 Gigawatt Power Plant

WATER: 1 Pickup Truck.

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OIL: 16 Supertankers.

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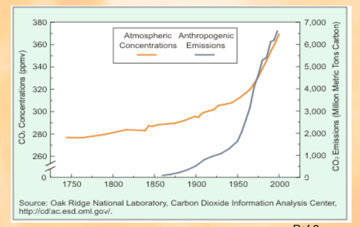
COAL: 45,000 car train, 560 miles long.

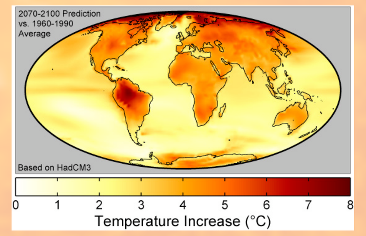
II. Carbon Dioxide Recycling

We sequester 5-6 10^6 tons of CO_2 yearly.

This equals 2.4-2.9 10^6 tons of CH_4.



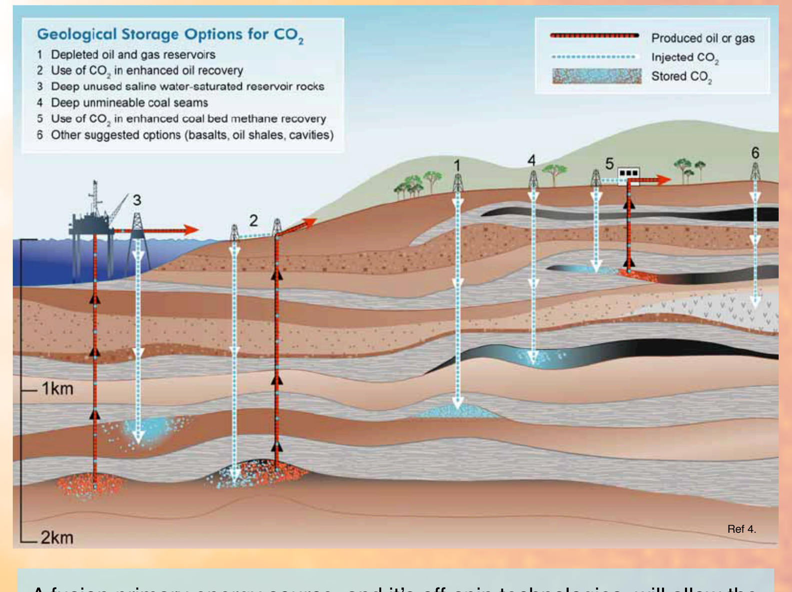
Ref 2.



Predicted global warming at the end of the 21st century, according to the Hadley Centre HadCM3 climate model, and assuming "business as usual" - predicted "normal" economic growth, with no significant steps to reduce greenhouse gas emissions. Ref 3.

A Melting Glacier

The Warming Arctic Region



A fusion primary energy source, and it's off-spin technologies, will allow the recycling of this valuable carbon into needed pipeline gas with a carbon neutral footprint!

III. Clean Water, Air, and Environment

IV. Recycling of Waste

A primary energy source allows recycling of all wastes into raw materials, industrial chemicals, and fuels.

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V. Transmutation Recycling of Radioactive Materials

All radioactive materials, irrespective of half-life, can be recycled into non radioactive elements and isotopes.

^{90}Strontium
^{137}Cesium
^{99}Technetium
^{129}Iodine

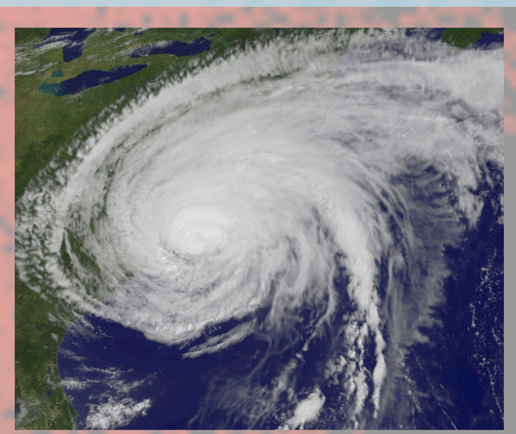
Safely Transmuted Into:

Hydrogen
Helium
Carbon
Oxygen
Water

This sounds like Alchemy, and it is! Changing lead into gold is a nuclear reaction. But the above and similar reactions are significantly more valuable than merely transforming lead into gold!

VI. Safely Dissipating Hurricanes

A fusion neutronic detonator allows hydrogen explosions without heavy radio-isotopic fallout. This provides for offshore disruption and dissipation of hurricanes at safe distances from land and people.



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3. http://blogs.ei.columbia.edu/2012/03/07/plugging-the-leaks-in-climate-models/
4. http://esd.lbl.gov/FILES/research/projects/induced_seismicity/co2/ CO2_storage_101.pdf page 6.

Abstract: Project of a 300 Watt Prototype Fusion Reactor

A project to complete the engineering, manufacturing, and test operation of a 300 watt spherical DeLuze fusion reactor. Detailed operational descriptions are presented in: APPARATUS FOR HOT FUSION OF FUSION-REACTIVE GASES; US Patent 8,090,071 B2 issued on 1/3/2012. Considerable materials and manufacturing engineering has already been completed. Suppliers of appropriate materials able to meet the exacting specifications of this job have been engaged. A machine shop with sufficient equipment, experience, and engineering support has been procured. Drafting is 30-40% completed. Specialized component electrical engineering is about 50% complete. Materials and electrical engineering, and project layout design is basically complete. The reactor is to be run on deuterium with and without the catalyst gas tetradeuteromethane. Operational parameters of voltage, current draw, temperature, gas pressure, gas mass spectrum analysis, neutron and other radiation output levels will be recorded to calculate power levels, stability, gain, and related factors. Operational maps predictive of larger devices will be derived.

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