

Stanley Meyer: Water Fuel Cell

[Electronics World & Wireless World](#) (January 1991)

[USP # 4,936,961](#) ~ Method for the Production of a Fuel Gas

[KeelyNet/Vanguard Notes](#)

[USP # 4,826,581](#) ~ Controlled Process for the Production of Thermal Energy from Gases...

[USP # 4,798,661](#) ~ Gas Generator Voltage Control Circuit

[USP # 4,613,304](#) ~ Gas Electrical Hydrogen Generator

[USP # 4,465,455](#) ~ Start-up/Shut-down for a Hydrogen Gas Burner

[USP # 4,421,474](#) ~ Hydrogen Gas Burner

[USP # 4,389,981](#) ~ Hydrogen Gas Injector System for Internal Combustion Engine

[Dan Danforth: Molecular Dissociation of Water](#)

[Water Fuel Cell News Release](#) (Winter/Spring 87/88)

[Raum & Zeit](#) 1(6) 63-68 (1990)

[Patents Granted](#) (@ 1990)

[Water Fuel Cell R&D Format](#)

[Infinite Energy](#) 19: 50-51 (1998) Obituary

[Water-Powered Car Video](#) (Link to <http://www.lonelantern.org/collection.html>)

Excerpts from: ***Electronics World & Wireless World*** (January 1991) ~ KeelyNet File MEYER1.ASC

Eye-witness accounts suggest that US inventor Stanley Meyer has developed an electric cell which will split ordinary tap water into hydrogen and oxygen with far less energy than that required by a normal electrolytic cell.

In a demonstration made before Professor Michael Laughton, Dean of Engineering at Mary College, London, Admiral Sir Anthony Griffin, a former controller of the British Navy, and Dr Keith Hindley, a UK research chemist. Meyer's cell, developed at the inventor's home in Grove City, Ohio, produced far more hydrogen/oxygen mixture than could have been expected by simple electrolysis.

Where normal water electrolysis requires the passage of current measured in amps, Meyer's cell achieves the same effect in milliamps. Furthermore, ordinary tap water requires the addition of an electrolyte such as sulphuric acid to aid current conduction; Meyer's cell functions at greatest efficiency with pure water.

According to the witnesses, the most startling aspect of the Meyer cell was that it remained cold, even after hours of gas production.

Meyer's experiments, which he seems to be able to perform to order, have earned him a series of US patents granted under Section 101. The granting of a patent under this section is dependent on a successful demonstration of the invention to a Patent Review Board.

Meyer's cell seems to have many of the attributes of an electrolytic cell except that it functions at high voltage, low current rather than the other way around. Construction is unremarkable. The electrodes --- referred to as "excitors" by Meyer --- are made from parallel plates of stainless steel formed in either flat or concentric topography. Gas production seems to vary as the inverse of the distance between them; the patents suggest a spacing of 1.5 mm produces satisfactory results.

The real differences occur in the power supply to the cell. Meyer uses an external inductance which appears to resonate with the capacitance of the cell --- pure water apparently possesses a dielectric constant of about 5 --- to produce a parallel resonant

circuit. This is excited by a high power pulse generator which, together with the cell capacitance and a rectifier diode, forms a charge pump circuit. High frequency pulses build a rising staircase DC potential across the electrodes of the cell until a point is reached where the water breaks down and a momentary high current flows. A current measuring circuit in the supply detects this breakdown and removes the pulse drive for a few cycles allowing the water to "recover".

Research chemist Keith Hindley offers this description of a Meyer cell demonstration: "After a day of presentations, the Griffin committee witnessed a number of important demonstration of the WFC" (water fuel cell as named by the inventor).

A witness team of independent UK scientific observers testified that US inventor Stanley Meyer successfully decomposed ordinary tap water into constituent elements through a combination of high, pulsed voltage using an average current measured only in milliamps. Reported gas evolution was enough to sustain a hydrogen /oxygen flame which instantly melted steel.

In contrast with normal high current electrolysis, the witnesses report the lack of any heating within the cell. Meyer declines to release details which would allow scientists to duplicate and evaluate his "water fuel cell". However, he has supplied enough detail to the US Patent Office to persuade them that he can substantiate his 'power-from-water' claims.

One demonstration cell was fitted with two parallel plate "excitors". Using tap water to fill the cell, the plates generated gas at very low current levels --- no greater than a tenth of an amp on the ammeter, and claimed to be milliamps by Meyer --- and this gas production increased steadily as the plates were moved closer together and decreased as they were separated. The DC voltage appeared to be pulsed at tens of thousands of volts.

A second cell carried nine stainless steel double tube cell units and generated much more gas. A sequence of photographs was taken showing gas production at milliamp levels. When the voltage was turned up to its peak value, the gas then poured off at a very impressive level.

"We did notice that the water at the top of the cell slowly became discolored with a pale cream and dark brown precipitate, almost certainly the effects of the chlorine in the heavily chlorinated tap water on the stainless steel tubes used as "excitors".

He was demonstrating hydrogen gas production at milliamp and kilovolt levels.

"The most remarkable observation is that the WFC and all its metal pipework remained quite cold to the touch, even after more than twenty minutes of operation. The splitting mechanism clearly evolves little heat in sharp contrast to electrolysis where the electrolyte

warms up quickly."

"The results appear to suggest efficient and controllable gas production that responds rapidly to demand and yet is safe in operation. We clearly saw how increasing and decreasing the voltage is used to control gas production. We saw how gas generation ceased and then began again instantly as the voltage driving circuit was switched off and then on again."

"After hours of discussion between ourselves, we concluded that Stan Meyer did appear to have discovered an entirely new method for splitting water which showed few of the characteristics of classical electrolysis. Confirmation that his devices actually do work come from his collection of granted US patents on various parts of the WFC system. Since they were granted under Section 101 by the US Patent Office, the hardware involved in the patents has been examined experimentally by US Patent Office experts and their seconded experts and all the claims have been established."

"The basic WFC was subjected to three years of testing. This raises the granted patents to the level of independent, critical, scientific and engineering confirmation that the devices actually perform as claimed."

The practical demonstration of the Meyer cell appears substantially more convincing than the para-scientific jargon which has been used to explain it. The inventor himself talks about a distortion and polarization of the water molecule resulting in the H:OH bonding tearing itself apart under the electrostatic potential gradient, of a resonance within the molecule which amplifies the effect.

Apart from the copious hydrogen/oxygen gas evolution and the minimal temperature rise within the cell, witnesses also report that water within the cell disappears rapidly, presumably into its component parts and as an aerosol from the myriad of tiny bubbles breaking the surface of the cell.

Meyer claims to have run a converted VW on hydrogen/oxygen mixture for the last four years using a chain of six cylindrical cells. He also claims that photon stimulation of the reactor space by optical fibre piped laser light increases gas production.

The inventor is a protegee' of the Advanced Energy Institute.

USP # 4,936,961

Method for the Production of a Fuel Gas

Stanley Meyer

Related Application: This is a continuation-in-part of my co-pending application Ser.; No. 081,859, filed 8/5/87, now U.S. Pat. No. 4,826, 581.

Field of Invention: This invention relates to a method of and apparatus for obtaining the release of a fuel gas mixture including hydrogen and oxygen from water.

BACKGROUND OF THE PRIOR ART

Numerous processes have been proposed for separating a water molecule into its elemental hydrogen and oxygen components. Electrolysis is one such process. Other processes are described in the United States patents such as 4,344,831; 4,184,931; 4,023,545; 3,980, 053; and Patent Cooperation Treaty application No. PCT/US80/1362, Published 30 April, 1981.

OBJECTS OF THE INVENTION

It is an object of the invention to provide a fuel cell and a process in which molecules of water are broken down into hydrogen and oxygen gases, and other formerly dissolved within the water is produced. As used herein the term "fuel cell" refers to a single unit of the invention comprising a water capacitor cell, as hereinafter explained, that produces the fuel gas in accordance with the method of the invention.

Brief Description of the Drawings

FIG. 1 illustrates a circuit useful in the process.

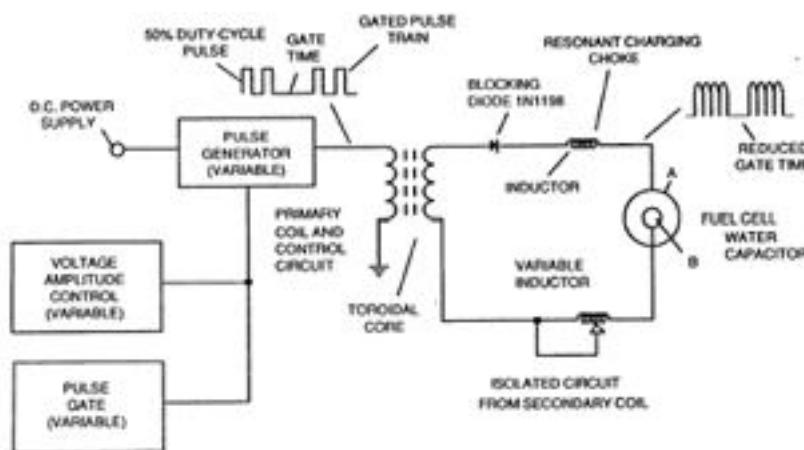
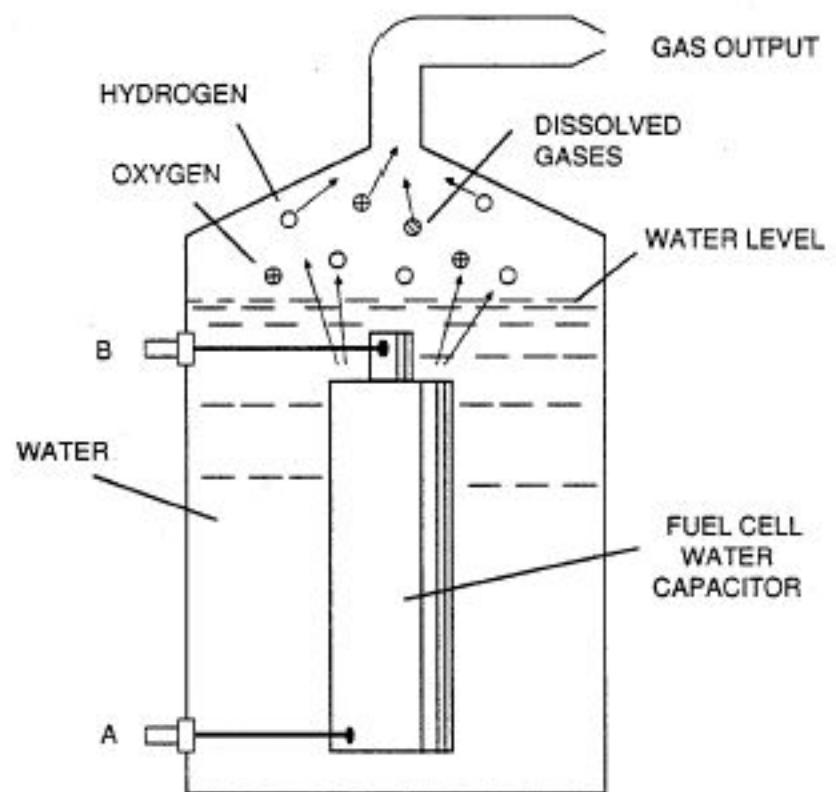
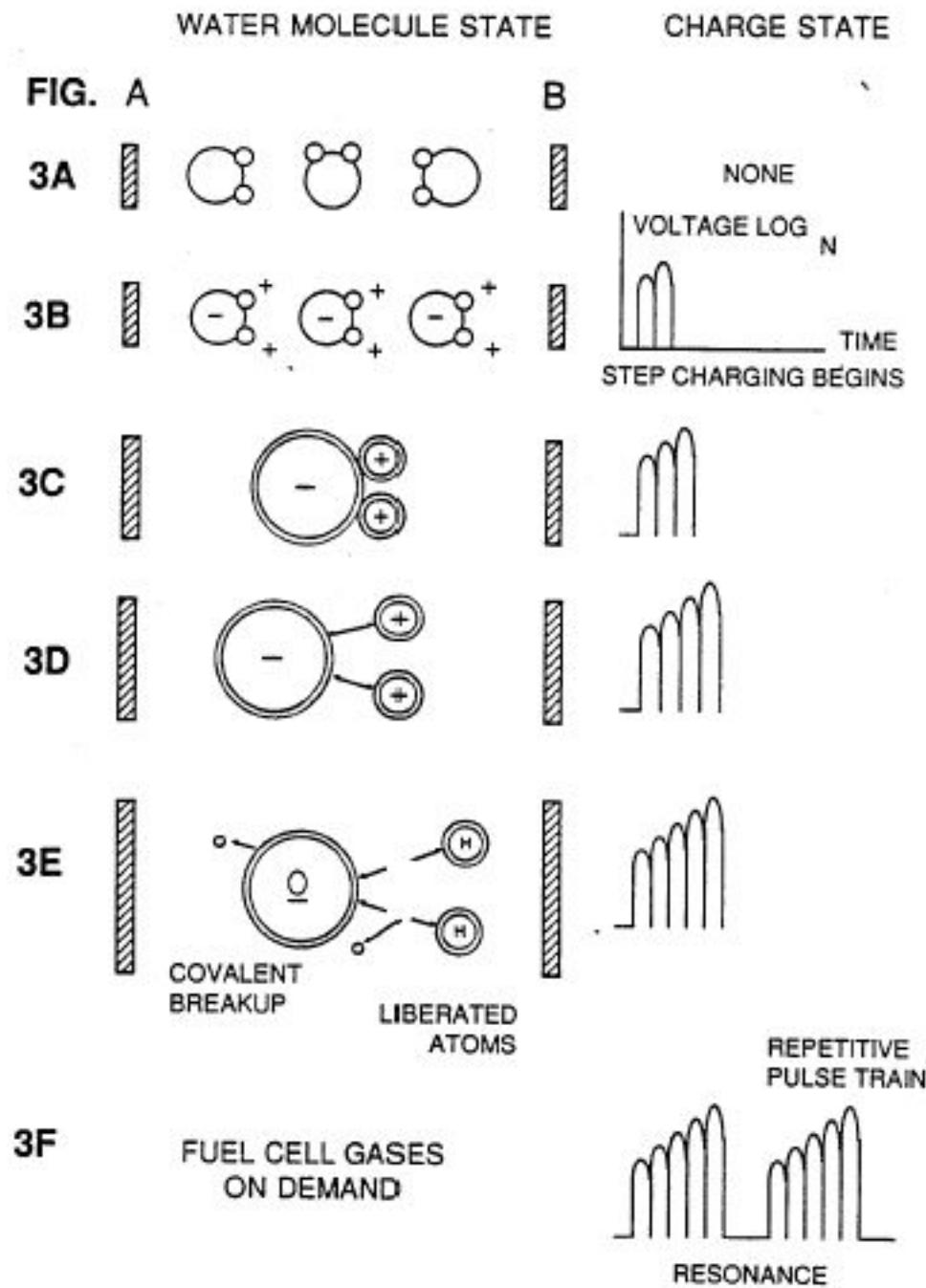


FIG. 2 shows a perspective of a "water capacitor" element used in the fuel cell circuit.



FIGS. 3A through 3F are illustrations depicting the theoretical bases for the phenomena encountered during operation of the invention herein.



Description of the Preferred Embodiment:

In brief, the invention is a method of obtaining the release of a gas mixture including hydrogen on oxygen and other dissolved gases formerly entrapped in water, from water consisting of:

(A) providing a capacitor, in which the water is included as a dielectric liquid between capacitor plates, in a resonant charging choke circuit that includes an inductance in series

with the capacitor;

(B) subjecting the capacitor to a pulsating, unipolar electric voltage field in which the polarity does not pass beyond an arbitrary ground, whereby the water molecules within the capacitor are subjected to a charge of the same polarity and the water molecules are distended by their subjection to electrical polar forces;

(C) further subjecting in said capacitor to said pulsating electric field to achieve a pulse frequency such that the pulsating electric field induces a resonance within the water molecule;

(D) continuing the application of the pulsating frequency to the capacitor cell after resonance occurs so that the energy level within the molecule is increased in cascading incremental steps in proportion to the number of pulses;

(E) maintaining the charge of said capacitor during the application of the pulsing field, whereby the co-valent electrical bonding of the hydrogen and oxygen atoms within said molecules is destabilized such that the force of the electrical field applied, as the force is effective within the molecule, exceeds the bonding force of the molecule, and hydrogen and oxygen atoms are liberated from the molecule as elemental gases; and

(F) collecting said hydrogen and oxygen gases, and any other gases that were formerly dissolved within the water, and discharging the collected gases as a fuel gas mixture.

The process follows the sequence of steps shown in the following Table 1 in which water molecules are subjected to increasing electrical forces. In an ambient state, randomly oriented water molecules are aligned with respect to a molecule polar orientation.

They are next, themselves polarized and "elongated" by the application of an electrical potential to the extent that covalent bonding of the water molecule is so weakened that the atoms dissociate and the molecule breaks down into hydrogen and oxygen elemental components.

Engineering design parameters based on known theoretical principles of electrical circuits determine the incremental levels of electrical and wave energy input required to produce resonance in the system whereby the fuel gas comprised of a mixture of hydrogen, oxygen, and other gases such as air were formerly dissolved within the water, is produced.

TABLE 1

Process Steps:

The sequence of the relative state of the water molecule and/or hydrogen/oxygen/other atoms:

- A. (ambient state) random
- B. Alignment of polar fields
- C. Polarization of molecule
- D. Molecular elongation
- E. Atom liberation by breakdown of covalent bond
- F. Release of gases

In the process, the point of optimum gas release is reached at a circuit resonance. Water in the fuel cell is subjected to a pulsating, polar electric field produced by the electrical circuit whereby the water molecules are distended by reason of their subjection to electrical polar forces of the capacitor plates.

The polar pulsating frequency applied is such that the pulsating electric field induces a resonance in the molecule. A cascade effect occurs and the overall energy level of specific water molecules is increased in cascading, incremental steps.

The hydrogen and oxygen atomic gases, and other gas components formerly entrapped as dissolved gases in water, are released when the resonant energy exceeds the covalent bonding force of the water molecule. A preferred construction material for the capacitor plates is stainless steel T-304 which is non-chemical reactive with water, hydrogen, or oxygen.

An electrically conductive material which is inert in the fluid environment is a desirable material of construction for the electrical field plates of the "water capacitor" employed in the circuit.

Once triggered, the gas output is controllable by the attenuation of operational parameters. Thus, once the frequency of resonance is identified, by varying the applied pulse voltage to the water fuel cell assembly, gas output is varied.

By varying the pulse shape and/or amplitude or pulse train sequence of the initial pulsing wave source, final gas output is varied. Attenuation of the voltage field frequency in the form of OFF and ON pulses likewise affects output.

The overall apparatus thus includes an electrical circuit in which a water capacitor having a known dielectric property is an element. The fuel gases are obtained from the water by the disassociation of the water molecule. The water molecules are split into component atomic elements (hydrogen and oxygen gases) by a voltage stimulation process called the electrical polarization process which also releases dissolved gases entrapped in the water.

From the outline of physical phenomena associated with the process described in Table 1, the theoretical basis of the invention considers the respective states of molecules and gases and ions derived from liquid water. Before voltage stimulation, water molecules are randomly dispersed throughout water in a container.

When a unipolar voltage pulse train such as shown in FIGS. 3B through 3F is applied to positive and negative capacitor plates, an increasing voltage potential is induced in the molecules in a linear, step like charging effect.

The electrical field of the particles within a volume of water including the electrical field plates increases from a low energy state to a high energy state successively in a step manner following each pulse-train as illustrated figuratively in the depictions of FIG. 3A through 3F.

The increasing voltage potential is always positive in direct relationship to negative ground potential during each pulse. The voltage polarity on the plates which create the voltage fields remains constant although the voltage charge increases. Positive and negative voltage "zones" are thus formed simultaneously in the electrical field of the capacitor plates.

In the first stage of the process described in Table 1, because the water molecule naturally exhibits opposite electrical fields in a relatively polar configuration (the two hydrogen atoms are positively electrically charged relative to the negative electrically charged oxygen atom), the voltage pulse causes initially randomly oriented water molecules in the liquid state to spin and orient themselves with reference to positive and negative poles of the voltage fields applied.

The positive electrically charged hydrogen atoms of said water molecule are attracted to a negative voltage field; while, at the same time, the negative electrically charged oxygen atoms of the same water molecule are attracted to a positive voltage field.

Even a slight potential difference applied to inert, conductive plates of a containment chamber which forms a capacitor will initiate polar atomic orientation within the water molecule based on polarity differences.

When the potential difference applied causes the orientated water molecules to align themselves between the conductive plates, pulsing causes the voltage field intensity to be increased in accordance with FIG. 3B. As further molecule alignment occurs, molecular movement is hindered.

Because the positively charged hydrogen atoms of said aligned molecules are attracted in a

direction opposite to the negatively charged oxygen atoms, a polar charge alignment or distribution occurs within the molecules between said voltage zones, as shown in FIG. 3B. And as the energy level of the atoms subjected to resonant pulsing increases, the stationary water molecules become elongated as shown in FIGS. 3C and 3D. Electrically charged nuclei and electrons are attracted toward opposite electrically charged equilibrium of the water molecule.

As the water molecule is further exposed to an increasing potential difference resulting from the step charging of the capacitor, the electrical force of attraction of the atoms within the molecule to the capacitor plates of the chamber also increase in strength. As a result, the covalent bonding between which form the molecule is weakened --- and ultimately terminated. The negatively charged electron is attracted toward the positively charged hydrogen atoms, while at the same time, the negatively charged oxygen atoms repel electrons.

In a more specific explanation of the "sub-atomic" action that occurs in the water fuel cell, it is known that natural water is a liquid which has a dielectric constant of 78.54 at 20 degrees C. and 1 atm pressure. [Handbook of Chemistry & Physics, 68th ed., CRC Press(Boca Raton, Florida (1987-88)), Section E-50. H2O(water)].

When a volume of water is isolated and electrically conductive plates, that are chemically inert in water and are separated by a distance, are immersed in water, a capacitor is formed, having a capacitance determined by the surface area of the plates, the distance of their separation and the dielectric constant of water.

When water molecules are exposed to voltage at a restricted current, water takes on an electrical charge. By the laws of electrical attraction, molecules align according to positive and negative polarity fields of the molecule and the alignment field. The plates of the capacitor constitute such as alignment field when a voltage is applied.

When a charge is applied to a capacitor, the electrical charge of the capacitor equals the applied voltage charge; in a water capacitor, the dielectric property of water resists the flow of amps in the circuit, and the water molecule itself, because it has polarity fields formed by the relationship of hydrogen and oxygen in the covalent bond, and intrinsic dielectric property, becomes part of the electrical circuit, analogous to a "microcapacitor" within the capacitor defined by the plates.

In the Example of a fuel cell circuit of FIG. 1, a water capacitor is included. The step-up coil is formed on a conventional toroidal core formed of a compressed ferromagnetic powered material that will not itself become permanently magnetized, such as the trademarked "Ferramic 06# "Permag" powder as described in Siemens Ferrites Catalog, CG-2000-002-121, (Cleveland, Ohio) No. F626-1205". The core is 1.50 inch in diameter

and 0.25 inch in thickness. A primary coil of 200 turns of 24 gauge copper wire is provided and coil of 600 turns of 36 gauge wire comprises the secondary winding.

In the circuit of FIG 1, the diode is a 1N1198 diode which acts as a blocking diode and an electric switch that allows voltage flow in one direction only. Thus, the capacitor is never subjected to a pulse of reverse polarity.

The primary coil of the toroid is subject to a 50% duty cycle pulse. The toroidal pulsing coil provides a voltage step-up from the pulse generator in excess of five times, although the relative amount of step-up is determined by preselected criteria for a particular application. As the stepped-up pulse enters first inductor (formed from 100 turns of 24 gauge wire 1 inch in diameter), an electromagnetic field is formed around the inductor, voltage is switched off when the pulse ends, and the field collapses and produces another pulse of the same polarity i.e., another positive pulse is formed where the 50% duty cycle was terminated. Thus, a double pulse frequency is produced; however, in pulse train of unipolar pulses, there is a brief time when pulses are not present.

By being so subjected to electrical pulses in the circuit of FIG. 1, water confined in the volume that includes the capacitor plates takes on an electrical charge that is increased by a step charging phenomenon occurring in the water capacitor. Voltage continually increases (to about 1000 volts and more) and the water molecules starts to elongate.

The pulse train is then switched off; the voltage across the water capacitor drops to the amount of the charge that the water molecules have taken on, i.e., voltage is maintained across the charged capacitor. The pulse train is the reapplied.

Because a voltage potential applied to a capacitor can perform work, the higher the voltage the higher the voltage potential, the more work is performed by a given capacitor. In an optimum capacitor that is wholly non-conductive, zero (0) current flow will occur across the capacitor.

Thus, in view of an idealized capacitor circuit, the object of the water capacitor circuit is to prevent electron flow through the circuit, i.e. such as occurs by electron flow or leakage through a resistive element that produces heat.

Electrical leakage in the water will occur, however, because of some residual conductivity and impurities or ions that may be otherwise present in the water. Thus, the water capacitor is preferably chemically inert. An electrolyte is not added to the water.

In the isolated water bath, the water molecule takes on charge, and the charge increases. The object of the process is to switch off the covalent bonding of the water molecule and interrupt the subatomic force, i.e. the electrical force or electromagnetic force, that binds

the hydrogen and oxygen atoms to form a molecule so that the hydrogen and oxygen separate.

Because an electron will only occupy a certain electron shell (shells are well known) the voltage applied to the capacitor affects the electrical forces inherent in the covalent bond. As a result of the charge applied by the plates, the applied force becomes greater than the force of the covalent bonds between the atom of the water molecule; and the water molecule becomes elongated. When this happens, the time share ratio of the electron shells is modified.

In the process, electrons are extracted from the water bath; electrons are not consumed nor are electrons introduced into the water bath by the circuit as electrons are conventionally introduced in as electrolysis process. There may nevertheless occur a leakage current through the water.

Those hydrogen atoms missing electrons become neutralized; atoms are liberated from the water. The charged atoms and electrons are attracted to the opposite polarity voltage zones created between the capacitor plates. The electrons formerly shared by atoms in the water covalent bond are reallocated such that neutral elemental gases are liberated.

In the process, the electrical resonance may be reached at all levels of voltage potential. The overall circuit is characterized as a "resonant charging choke" circuit which is an inductor in series with a capacitor that produces a resonant circuit. [SAMS Modern Dictionary of Electronics, Rudolf Garff, copyright 1984, Howard W. Sams & Co. (Indianapolis, Ind.), page 859.]

Such a resonant charging choke is on each side of the capacitor. In the circuit, the diode acts as a switch that allows the magnetic field produced in the inductor to collapse, thereby doubling the pulse frequency and preventing the capacitor from discharging. In this manner a continuous voltage is produced across the capacitor plates in the water bath; and the capacitor does not discharge. The water molecules are thus subjected to a continuously charged field until the breakdown of the covalent bond occurs.

As noted initially, the capacitance depends on the dielectric properties of the water and the size and separation of the conductive elements forming the water capacitor.

EXAMPLE 1

In an example of the circuit of FIG. 1 (in which other circuit element specifications are provided above), two concentric cylinders 4 inches long formed the water capacitor of the fuel cell in the volume of water. The outside cylinder was 0.75 inch in outside diameter; the inner cylinder was 0.5 inch in outside diameter.

Spacing from the outside of the inner cylinder to the inner surface of the outside cylinder was 0.0625 inch. Resonance in the circuit was achieved at a 26 volt applied pulse to the primary coil of the toroid at 0 KHz, and the water molecules disassociated into elemental hydrogen and oxygen and the gas released from the fuel cell comprised a mixture of hydrogen, oxygen from the water molecule, and gases formerly dissolved in the water such as the atmospheric gases or oxygen, nitrogen, and argon.

In achieving resonance in any circuit, as the pulse frequency is adjusted, the flow of amps is minimized and the voltage is maximized to a peak. Calculation of the resonance frequency of an overall circuit is determined by known means; different cavities have a different frequency of resonance dependant on parameters of the water dielectric, plate size, configuration and distance, circuit inductors, and the like. Control of the production of fuel gas is determined by variation of the period of time between a train of pulses, pulse amplitude and capacitor plate size and configuration, with corresponding value adjustments to other circuit components.

The wiper arm on the second conductor tunes the circuit and accommodates to contaminants in water so that the charge is always applied to the capacitor. The voltage applied determines the rate of breakdown of the molecule into its atomic components. As water in the cell is consumed, it is replaced by any appropriate means or control system.

Variations of the process and apparatus may be evident to those skilled in the art.

What is claimed is:

1. A method of obtaining the release of a gas mixture including hydrogen and oxygen and other dissolved gases formerly entrapped in water, from water, consisting of:
 - (A) providing a capacitor in which water is included as a dielectric between capacitor plates, in a resonant charging choke circuit that includes an inductance in series with the capacitor;
 - (B) subjecting the capacitor to a pulsating, unipolar electric charging voltage in which the polarity does not pass beyond an arbitrary ground, whereby the water molecules within the capacitor plates;
 - (C) further subjecting the water in said capacitor to a pulsating electric field resulting from the subjection of the capacitor to the charging voltage such that the pulsating electric field induces a resonance within the water molecules;
 - (D) continuing the application of the pulsating charging voltage to the capacitor after the resonance occurs so that the energy level within the molecules is increased in cascading

incremental steps in proportion to the number of pulses;

(E) maintaining the charge of said capacitor during the application of the pulsating charge voltage, whereby the covalent electrical bonding of the hydrogen and oxygen atoms within said molecules is destabilized, such that the force of the electrical field applied to the molecules exceeds the bonding force within the molecules, and the hydrogen and oxygen atoms are liberated from the molecules as elemental gases.

2. The method of claim 1 including the further steps of collecting said liberated gases and any other gases that were formerly dissolved within the water and discharging said collected gases as a fuel gas mixture.

Keelynet/Vangard Notes

1N1198 Diode is also a NTE 5995 or a ECG 5994. It is a 40A 600 PIV Diode (the 40A is over kill and may not be needed).

Stainless Steel "T304" is a type of weldable Stainless, but other types should work the same. "T304" is just the more common type of Stainless tubing available.

The outer tube figures out to be 3/4" 16 gauge (.060 "wall") tube (a common size) cut to 4 inch length.

The inner tube figures out to be 1/2" 18 gauge (.049 "wall", this is a common size for this tube, but the actual gauge cannot be figured from this patent documentation, but this size should work) cut to 4 inch length.

You should also attach the two leads to the Stainless, using Stainless solid rod (1/6 dia would do) and USE LEAD FREE SOLDER ! (you may want the purified water that is returned to drink some day).

You also need to figure out a way to keep the two tubes separated from each other. This could be done with small pieces of plastic. They cannot block the flow of water into/out of the tubes.

It was not indicated if the inner tube is full of water or not. The guess here is that it is full of water, and this doesn't effect the device at all.

The Patent doesn't say but I would think that insulating the leads with some type of tubing up to the tubes would be electrically correct (and probably wouldn't hurt).
The pulse frequency was not printed, it is estimated from the size of the coils and transformer that the frequency doesn't exceed 50 Mhz. Don't depend on this being fact, it's just a educated guess.

The circuit to do this is not shown, just empty boxes. It's time to get out your SCOPE and try things! Don't forget to share your results with others ! GREED is why this type of thing never gets out into the world to do some GOOD. If you want to make some money, make something PRACTICAL that WORKS and that PEOPLE can use in their every day lives, then sell it! Holding onto information like this only hurts ALL OF US !!

USP # 4,826,581

Controlled Process for the Production of Thermal Energy from Gases and Apparatus Useful Therefor

**Stanley Meyer
(May 2, 1989)**

Abstract ~

A method of and apparatus for obtaining the release of energy from a gas mixture including hydrogen and oxygen in which charged ions are stimulated to an activated state, and then passed through a resonant cavity, where successively increasing energy levels are achieved, and finally passed to an outlet orifice to produce thermal explosive energy.

Inventors: Meyer; Stanley A. (3792 Broadway, Grove City, OH 43123)

Appl. No.: 081859 ~ Filed: August 5, 1987

Current U.S. Class: 204/157.41; 204/164 ~ Intern'l Class: C07G 013/00

Field of Search: 204/164,157.41,157.44

References Cited:U.S. Patent Documents ~

4,233,109 Nov., 1980 Nishizawa 204/164.

4,406,765 Sep., 1983 Higashi, et al. 204/164.

4,687,753 Aug., 1987 Fiato et al. 204/157.

4,695,357 Sep., 1987 Boussert 204/157.

Primary Examiner: Kalafut; Stephen J. ~ Attorney, Agent or Firm: Porter, Wright, Morris & Arthur

Claims ~

1. A method of obtaining the release of energy from a gas mixture including hydrogen and oxygen consisting of: (A) providing a first gas mixture including at least a portion of hydrogen and oxygen gases; (B) subjecting the gas mixture to a pulsating, polar electric field whereby electrons of the gas atoms are distended in their orbital fields by reason of their subjection to electrical polar forces, at a frequency such that the pulsating electric field induces a resonance with respect to an electron of the gas atom; (C) cascading said gas atoms with respect to the pulsating electric field such that the energy level of the resonant electron is increased in cascading incremental steps; (D) ionizing said gas atoms; (E) subjecting the ionized gas atoms to electromagnetic wave energy having a predetermined frequency to induce a further election resonance in the ion, whereby the energy level of the electron is successively increased; (F) extracting further electrons from the resonating ions while such ions are in an increased energy state to destabilize the nuclear and electron configuration of said ions; and (G) subjecting the destabilized ions to thermal ignition.

2. An apparatus for obtaining the release of energy from a gas mixture including hydrogen and oxygen consisting of successively interconnected: (A) first means for providing a first gas mixture including at least a portion of hydrogen and oxygen gas; (B) second means for providing a pulsating, polar electric field to the gas mixture, whereby electrons of the gas atoms are distended in their orbital fields by reason of their subjection to electrical polar forces, at a frequency such that the pulsating electric field induces a resonance with respect to an electron of the gas atom; and the energy level of the resonant electron is increased in cascading, incremental steps; (C) third means for providing a further electric field to ionize said gas atoms; (D) an electromagnetic wave energy source for subjecting the ionized gas atoms to wave energy of a predetermined frequency to induce a further election resonance in the ion, whereby the energy level of the electron is further successively increased; (E) an electron sink for extracting electrons from the resonating ions while such ions are in an increased energy state to destabilize the nuclear and electron configuration of said ions; (F) fourth means for directing particle flow in a continuous manner through the electric fields, wave energy source and electron sink to a final orifice at which the destabilized ions are thermally ignited; and (G) a final orifice at which the mixture initially provided by the first means, after having passed through and been processed by the preceeding means of the apparatus, is thermally ignited.

Description~

FIELD OF THE INVENTION

This invention relates to a method of and apparatus for obtaining the release of energy from a gas mixture including hydrogen and oxygen in which charged ions are stimulated to an activated state, and then passed through a resonant cavity, where successively increasing energy levels are achieved, and finally passed to an outlet orifice to produce thermal explosive energy.

BACKGROUND OF THE PRIOR ART

Processes have been proposed for many years in which controlled energy producing reactions of atomic particles are expected to occur under "cold" conditions. [See. e.g.. Rafelski, J. and Jones, S.E., "Cold Nuclear Fusion," Scientific American, July, 1987, page 84]. The process and apparatus described herein are considered variations to and improvements in processes by which energy is derived from excited atomic components in a controllable manner.

OBJECTS OF THE INVENTION

It is an object of the invention to realize significant energy-yield from water atoms. Molecules of water are broken down into hydrogen and oxygen gases. Electrically charged gas ions of opposite electrical polarity are activated By Express Mail No. 26224690 on August 5, 1987 by electromagnetic wave energy and exposed to a high temperature thermal zone. Significant amounts of thermal energy with explosive force beyond the gas burning stage are released.

An explosive thermal energy under a controlled state is produced. The process and apparatus provide a heat energy source useful for power generation, aircraft, rocket engines, or space stations.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 illustrates a staged arrangement of apparatus useful in the process, beginning with a water inlet and culminating in the production of thermal explosive energy.

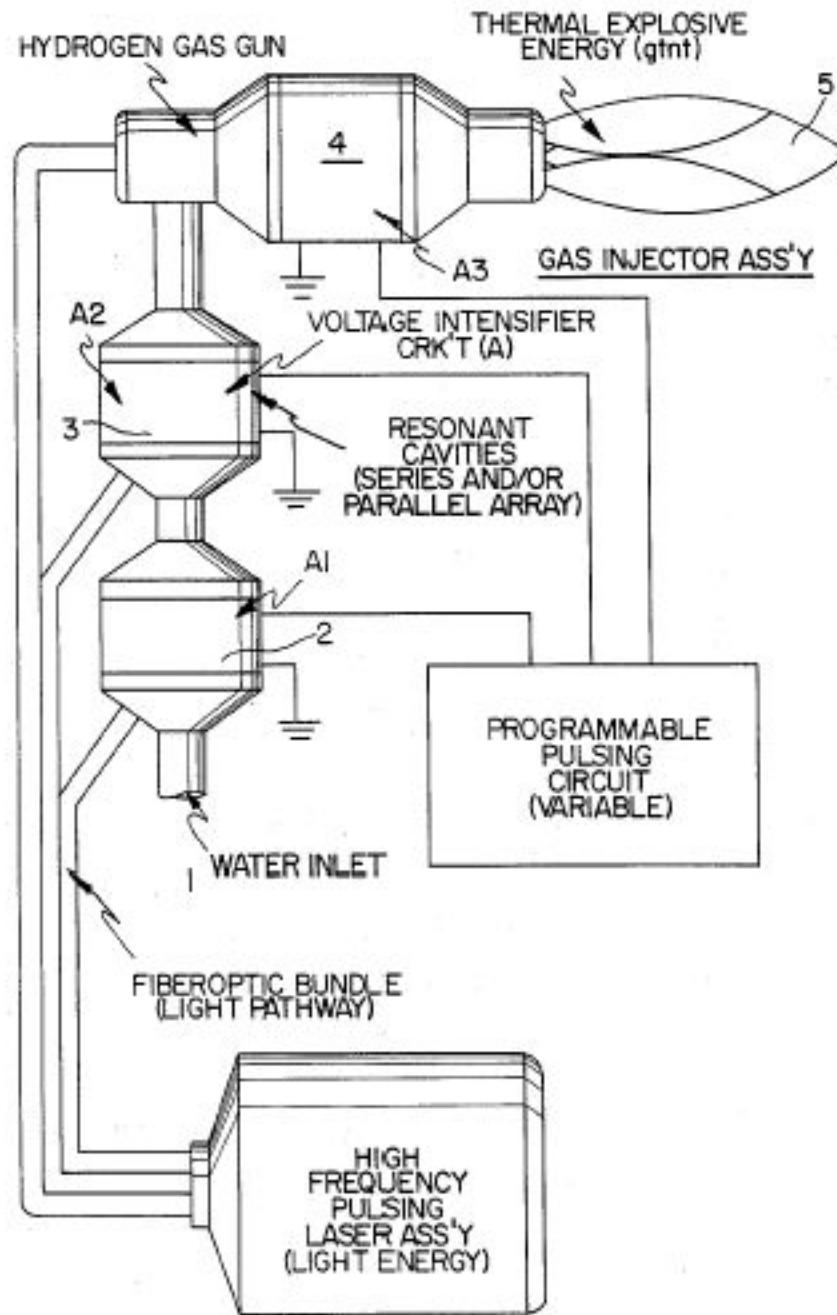


FIG. 2A shows a cross-section of a circular gas resonant cavity used in the final stage assembly of FIG. 1.

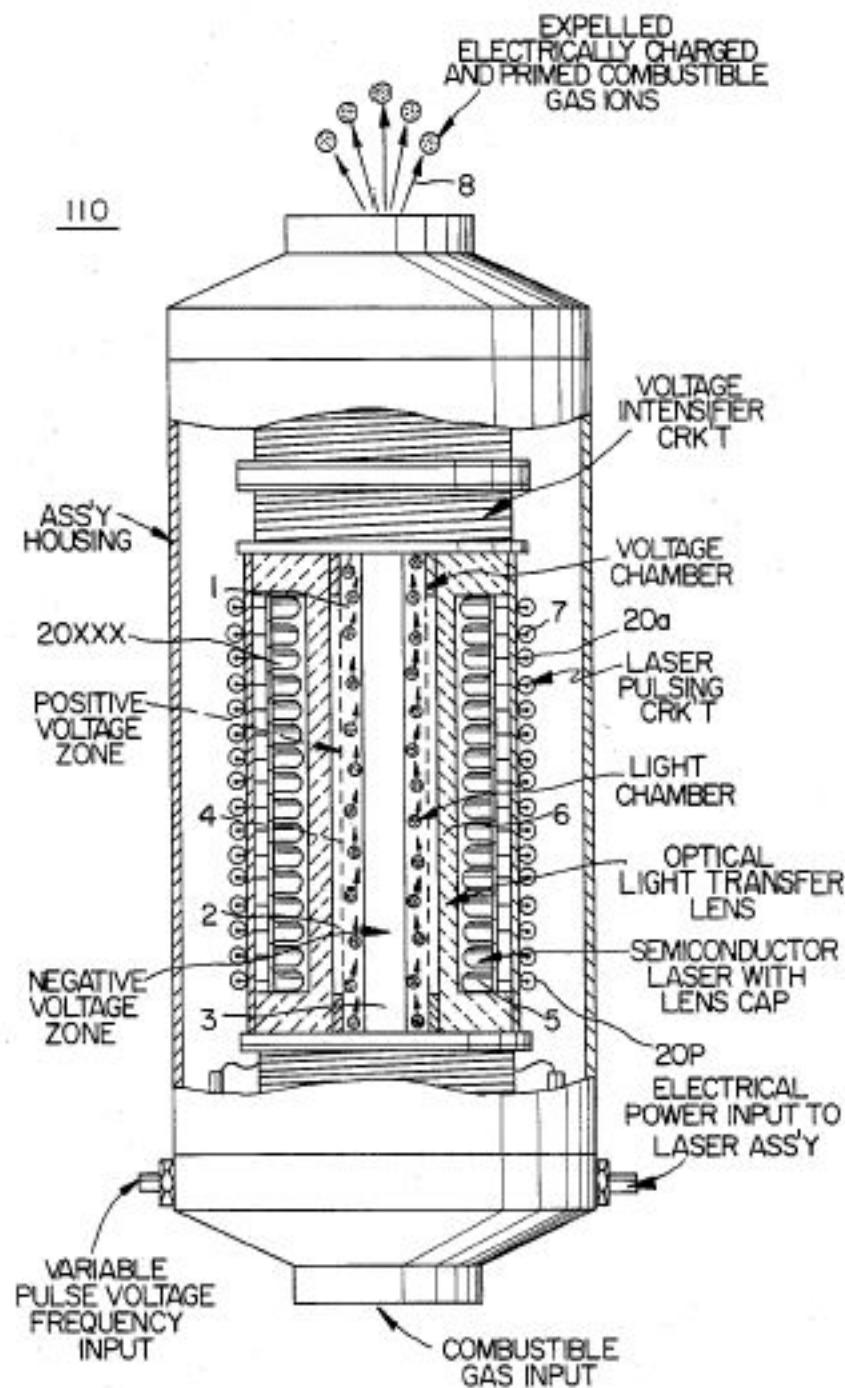


FIG. 2B shows an alternative final stage injection system useful in the apparatus of FIG. 1.
[Error in patent: Figure not shown]

FIG. 2C shows an optical thermal lens assembly for use either final stage of FIG. 2A or FIG. 2B.

[Error in patent: Figure not shown]

FIGS. 3A, 3B, 3C and 3D are illustrations depicting various theoretical bases for atomic

phenomena expected to occur during operation of the invention herein.
[Error in patent: Figure not shown]

FIG. 4 is an electrical schematic of the voltage source for the gas resonant cavity.
[Error in patent: Figure not shown]

FIGS. 5A and 5B, respectively, show (A) an electron extractor grid used in the injector assemblies of FIG. 2A and FIG. 2B, and (B) the electronic control circuit for the extractor grid.

[Error in patent: Figure not shown]

[Actual Figures:]

Figure 3

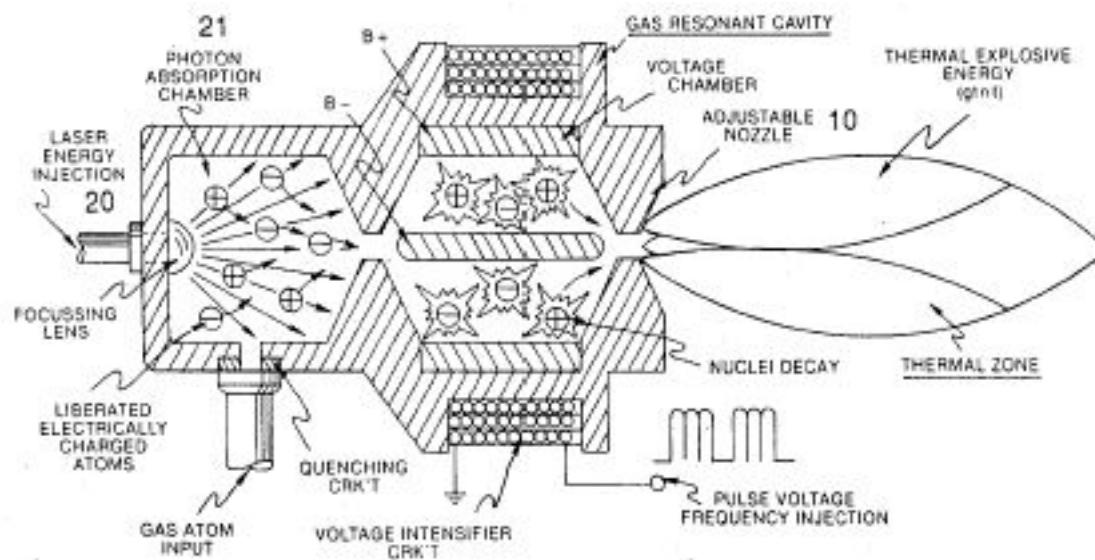


Figure 4

FIG.4

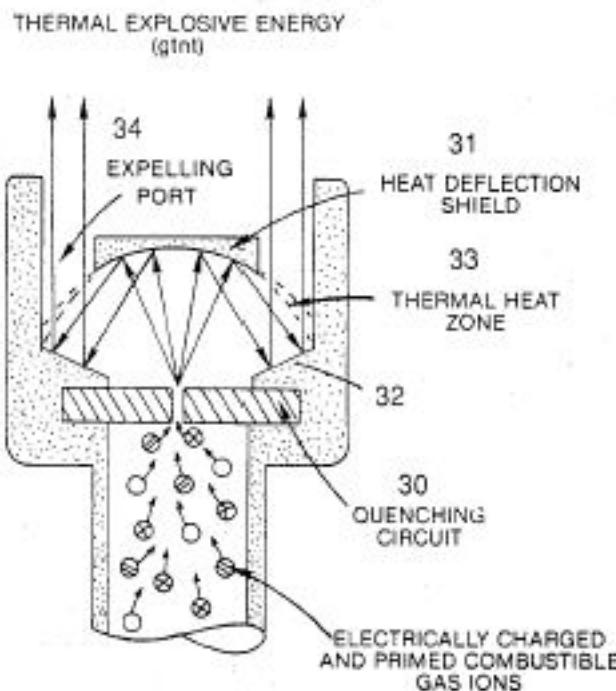


Figure 5

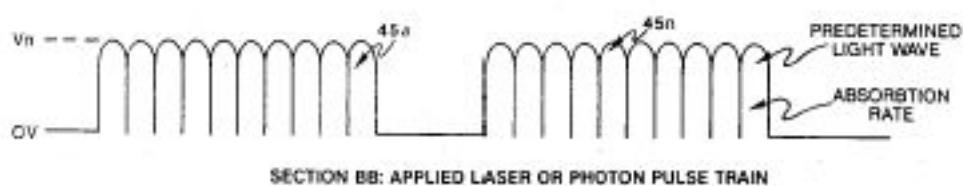
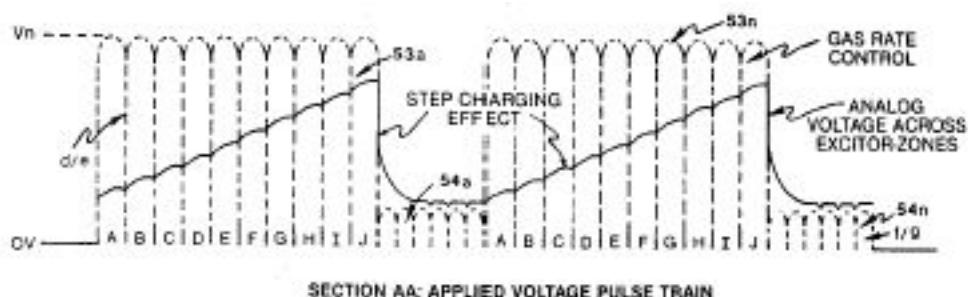


Figure 6

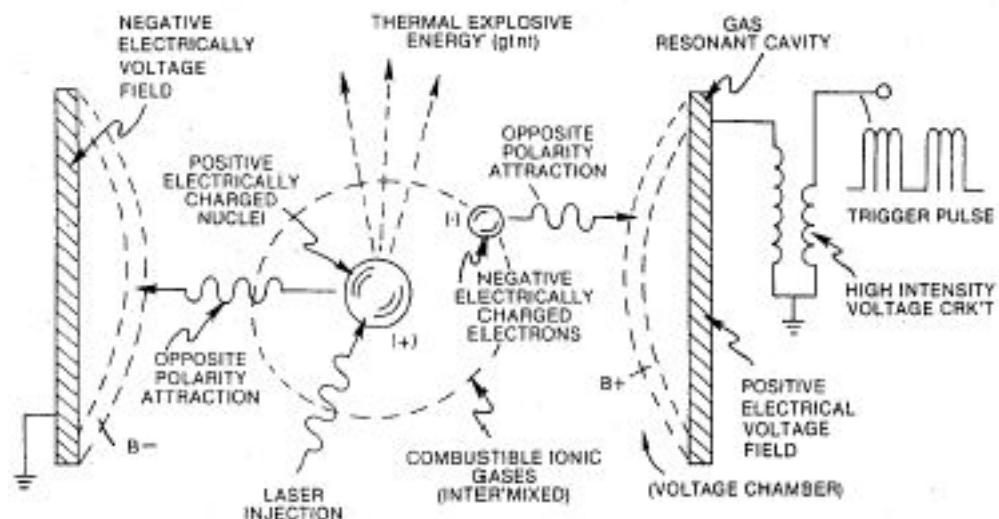


Figure 7

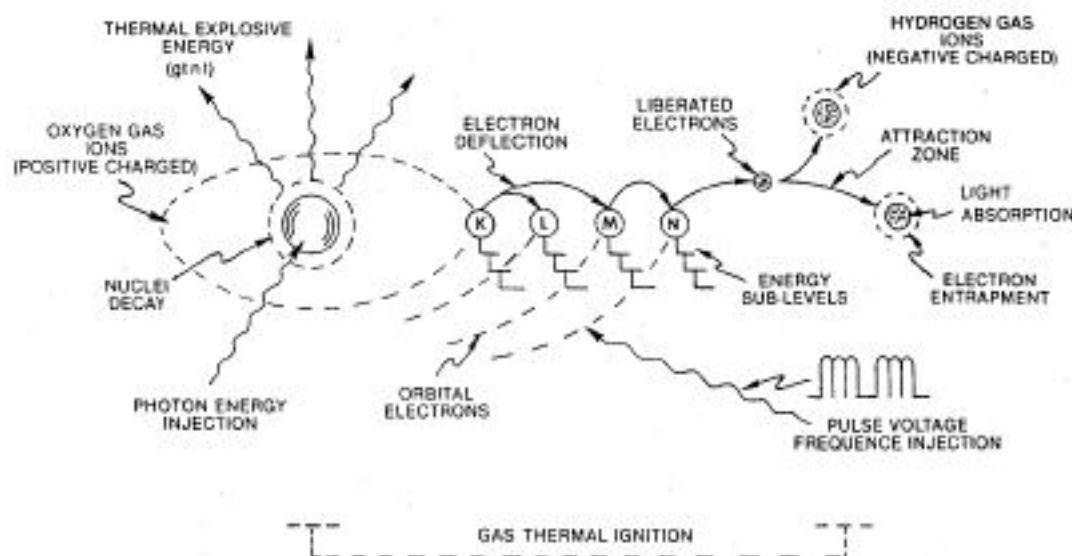
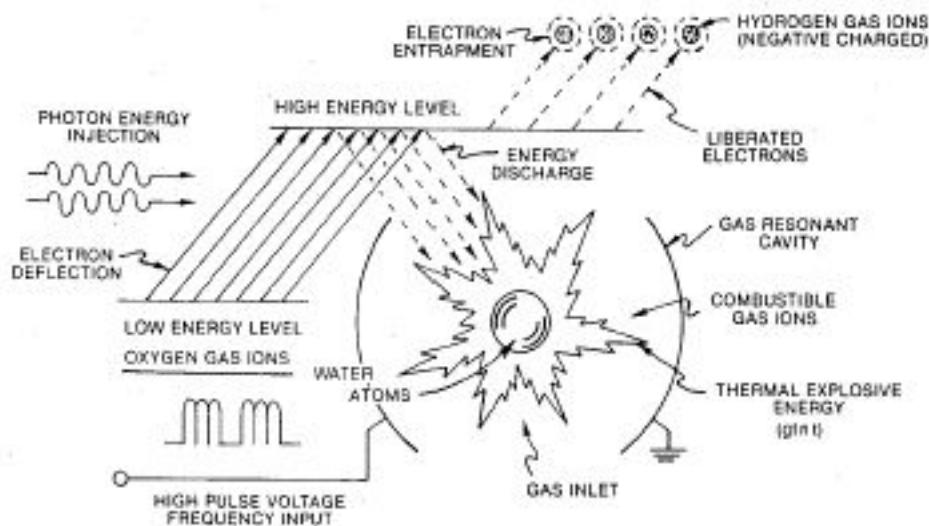
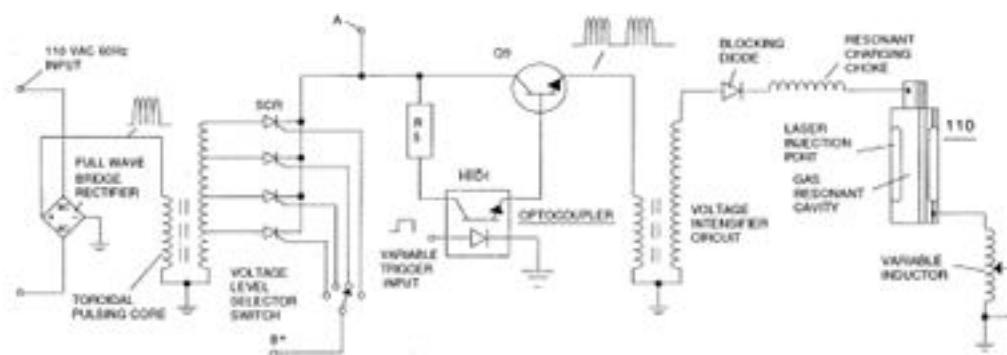


Figure 8

**Figure 9****Figure 10**

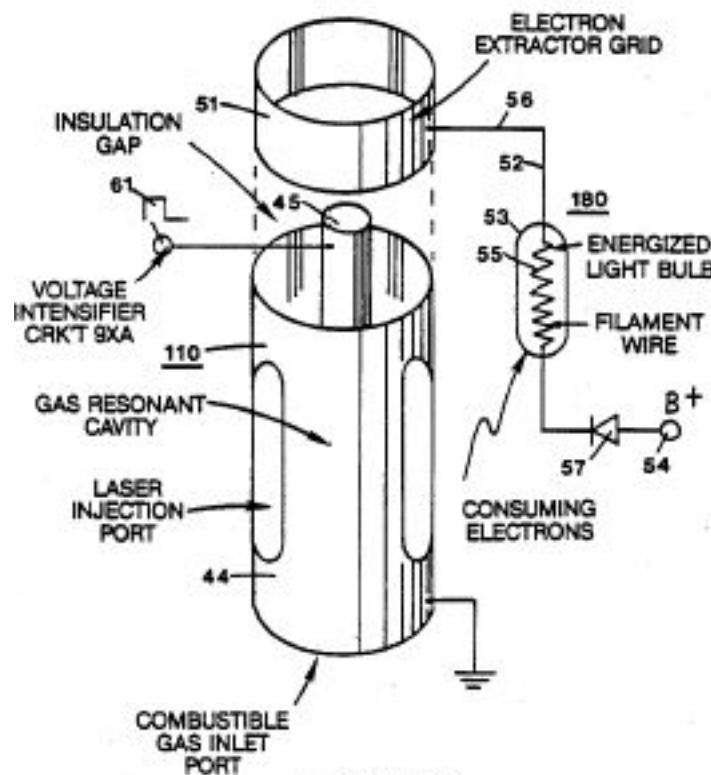
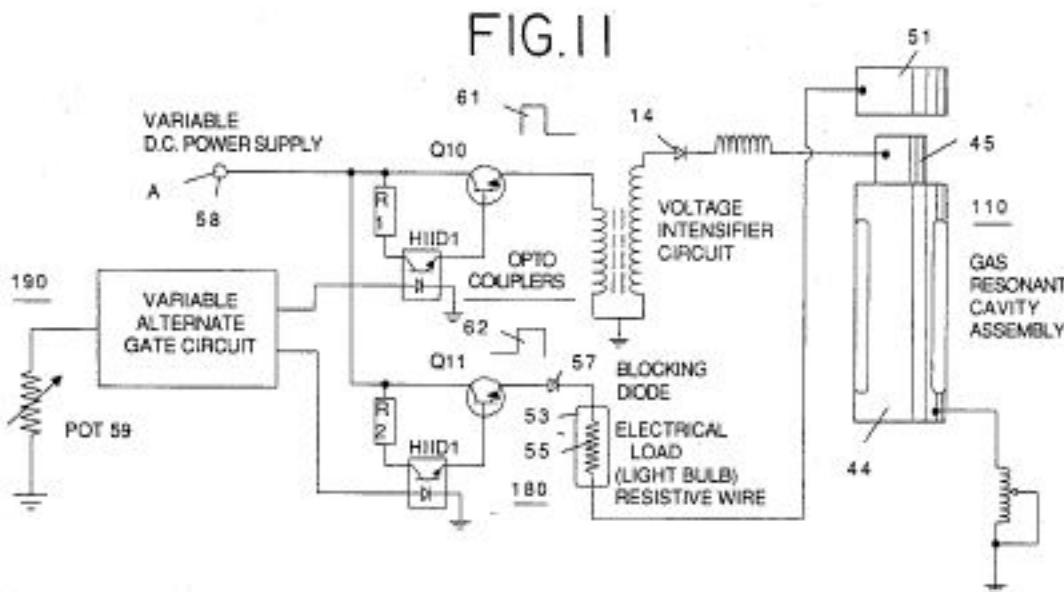


FIG.10

Figure 11



DESCRIPTION OF THE PREFERRED EMBODIMENT

The hydrogen fracturing process, follows the sequence of steps shown in the following Table I in which beginning with water molecules, the molecule is subjected to successively increasing electrical, wave energy and thermal forces. In the succession of forces, randomly

oriented water molecules are aligned with respect to molecular polar orientation and are themselves polarized and "elongated" by the application of an electric potential to the extent that covalent bonding of the water molecule is so weakened that the atoms disassociate and the molecule breaks down into hydrogen and oxygen elemental components. The released atomic gases are next ionized and electrically charged in a vessel while being subjected to a further energy source that promotes inter-particle impact in the gas at an increased overall energy level. Finally, the atomic particles in the excited gas, having achieved successively higher energy levels, are subjected to a laser or electromagnetic wave energy source that produces atomic destabilization and the final release of thermal explosive energy. Engineering design parameters based on known theoretical principles of atomic physics determine the incremental levels of electrical and wave energy input required to produce resonance in each stage of the system. Instead of a dampening effect, a resonant energization of the molecule, atom or ion provides a compounding energy interaction resulting in the final energy release.

TABLE I

PROCESS STEPS LEADING TO IGNITION

**RELATIVE STATE OF WATER MOLECULE AND/OR
HYDROGEN/OXYGEN/OTHER ATOMS**

RANDOM	1st Stage
ALIGNMENT	Water to Gas
POLARIZATION	2nd Stage
MOLECULAR ELONGATION	Gas Ionization
ATOM LIBERATION	3rd Stage
LIQUID TO GAS IONIZATION	Priming
ELECTRICAL CHARGING EFFECT	

Final Stage

PARTICLE IMPACT	Ignition
ELECTROMAGNETIC WAVE, LASER OR	
PHOTON INJECTION	
ELECTRON EXTRACTION	
ATOMIC DESTABILIZATION	
THERMAL IGNITION	

After the first stage in which water is broken down into its atomic components in a mixture of hydrogen, oxygen and formerly dissolved entrapped gasses, the gas atoms become elongated during electron removal as the atoms are ionized. Laser, or light wave energy of a predetermined frequency is injected into a containment vessel in a gas ionization process. The light energy absorbed by voltage stimulated gas nuclei causes destabilization of gas

ions still further. The absorbed laser energy causes the gas nuclei to increase in energy state, which, in turn, causes electron deflection to a higher orbital shell.

The electrically charged and laser primed combustible gas ions from a gas resonant cavity may be directed into an optical thermal lens assembly for triggering. Before entry into the optimal thermal lens, however, electrons are stripped from the ions and the atom is destabilized. The destabilized gas ions which are electrically and mass unbalanced atoms having highly energized nuclei are pressurized during spark ignition. The unbalanced, destabilized atomic components thermally interact; the energized and unstable hydrogen gas nuclei collide with highly energized and unstable oxygen gas nuclei, causing and producing thermal explosive energy beyond the gas burning stage. The ambient air gas components in the initial mixture aid the thermal explosive process under a controlled state.

In the process, the point of optimum energy-yield is reached when the electron deficient oxygen atoms (having less than a normal number of electrons) lock onto and capture a hydrogen atom electron prior to or during thermal combustion of the hydrogen/oxygen mixture. Atomic decay results in the release of energy.

In a general outline of the method, a first gas mixture including at least a portion of hydrogen and oxygen gases is provided. The gas mixture is subjected to a pulsating, polar electric field whereby electrons of the gas atoms are distended in their orbital fields by reason of their subjection to electrical polar forces. The polar pulsating frequency applied is such that the pulsating electric field induces a resonance with respect to an election of the gas atom. A cascade effect results and the energy level of specific resonating electron is increased in cascading, incremental steps.

Next, the gas atoms are ionized and subjected to electro-magnetic wave energy having a predetermined frequency to induce a further election resonance in the ion, whereby the energy level of the election is successively increased. Electrons are extracted from the resonating ions while such ions are in an increased energy state to destabilize the nuclear electron configuration of said ions; and the gas mixture of destabilized ions is thermally ignited.

In the apparatus shown in FIG. 1, water is introduced at inlet 1 into a first stage water fracturing module 2 in which water molecules are broken down into hydrogen, oxygen and released entrapped gas components by an electrical disassociation process and apparatus such as shown in my co-pending application Ser. No. 835,564, filed March 3, 1986, which is incorporated herein by reference. The released atomic gases and other gas components formerly entrapped as dissolved gases in water may be introduced to a successive stage 3 or other number of like resonant cavities, which are arranged in either a series or parallel combined array. The successive energization of the gas atoms provides a cascading effect,

successively increasing the voltage stimulation level of the released gasses as they sequentially pass through cavities 2, 3, etc. In a final stage, an injector system 4, of a configuration of the type shown in FIGS. 2A or 2B, receives energized atomic and gas particles where the particles are subjected to further energy input, electrical excitation and thermal stimulation, whereby thermal explosive energy results 5, which may be directed thru a lens assembly of the type shown in FIG. 2C to provide a controlled thermal energy output.

Electromagnetic wave activated and electrically charged gas ions of hydrogen and oxygen (of opposite polarity) are expelled from the cascaded cells 2, 3, etc. The effect of cascading successively increases the voltage stimulation level of the released gases, which then are directed to the final injector assembly 4. In the injector assembly, gas ions are stimulated to a yet higher energy level. The gases are continually exposed to a pulsating laser or other electromagnetic wave energy source together with a high intensity oscillating voltage field that occurs within the cell between electrodes or conductive plates of opposite electrical polarity. A preferred construction material for the plates is a stainless steel T-304 which is non-chemically reactive with water, hydrogen, or oxygen. An electrically conductive material which is inert in the fluid environment is a desirable material of construction for the electrical field producing plates, through which field the gas stream of activated particles passes. Gas ions of opposite electrical charges reach and maintain a critical energy level state. The gas ions are oppositely electrically charged and subjected to oscillating voltage fields of opposite polarity and are also subjected to a pulsating electromagnetic wave energy source. Immediately after reaching critical energy, the excited gas ions are exposed to a high temperature thermal zone in the injection cell, 4, that causes the excited gas ions to undergo gas combustion. The gas ignition triggers atomic decay and releases thermal energy, 5, with explosive force.

Once triggered, the thermal explosive energy output is controllable by the attenuation of operational parameters. With reference to FIG. 4A, for example, once the frequency of resonance is identified, by varying applied pulse voltage to the initial water fuel cell assemblies, 2, 3, the ultimate explosive energy output is likewise varied. By varying the pulse shape and/or amplitude or pulse train sequence of the electromagnetic wave energy source, final output is varied. Attenuation of the voltage field frequency in the form of OFF and ON pulses likewise affects output of the staged apparatus. Each control mechanism can be used separately, grouped in sections, or systematically arranged in a sequential manner.

The overall apparatus thus includes means for providing a first gas mixture consisting of at least a portion of hydrogen and oxygen gas. The gases may be obtained by disassociation of the water molecule. An electrical circuit of the type shown in FIG. 4 provides a pulsating, polar electric field to the gas mixture as illustrated in FIG. 3A, whereby electrons of the gas atoms are distended in their orbital fields by reason of their subjection to electrical polar forces, changing from the state conceptually illustrated by FIG. 3B to

that of FIG. 3C, at a frequency such that the pulsating electric field induces a resonance with respect to electrons of the gas atoms. The energy level of the resonant electrons is thereby increased in cascading, incremental steps. A further electric field to ionize said gas atoms is applied and an electromagnetic wave energy source for subjecting the ionized gas atoms to wave energy of a predetermined frequency to induce a further electron resonance in the ion, whereby the energy level of the election is successively increased is an additional element of the apparatus as shown in FIG. 3D.

An electron sink, which may be in the form of the grid element shown in FIG. 5A, extracts further electrons from the resonating ions while such ions are in an increased energy state and destabilizes the nuclear electron configuration of the ions. The "extraction" of electrons by the sink means is coordinated with the pulsating electrical field of the resonant cavity produced by the circuit of FIG. 4, by means of an interconnected synchronization circuit, such as shown in FIG. 5B. A nozzle, 10 in FIG. 2B, or thermal lens assembly, FIG. 2C, provides the directing means in which the destabilized ions are finally thermally ignited.

As previously noted, to reach and trigger the ultimate atomic decay of the fuel cell gases at the final stage, sequential steps are taken. First, water molecules are split into component atomic elements (hydrogen and oxygen gases) by a voltage stimulation process called the electrical polarization process which also releases dissolved gases entrapped in the water (See my co-pending application for letters patent, Ser. No. 835, 564, *supra*). In the injector assembly, a laser produced light wave or other form of coherent electromagnetic wave energy capable of stimulating a resonance within the atomic components is absorbed by the mixture of gases (hydrogen/oxygen/ambient air gases) released by the polarization process. At this point, as shown in FIG. 3B, the individual atoms are subjected to an electric field to begin an ionization process.

The laser or electromagnetic wave energy is absorbed and causes gas atoms to lose electrons and form positively charged gas ions. The energized hydrogen atoms which, as ionized, are positively charged, now accept electrons liberated from the heavier gases and attract other negatively charged gas ions as conceptually illustrated in FIG. 3C. Positively and negatively charged gas ions are re-exposed to further pulsating energy sources to maintain random distribution of ionized atomic gas particles.

The gas ions within the wave energy chamber are subjected to an oscillating high intensity voltage field in a chamber 11 in FIGS. 2A and 2B formed within electrodes 12 and 13 in FIGS. 2A and 2B of opposite electrical polarity to produce a resonant cavity. The gas ions reach a critical energy state at a resonant state.

At this point, within the chamber, additional electrons are attracted to said positive electrode; whereas, positively charged ions or atomic nuclei are attracted to the negative

electrode. The positive and negative attraction forces are co-ordinate and operate on said gas ions simultaneously; the attraction forces are non-reversible. The gas ions experience atomic component deflection approaching the point of electron separation. At this point electrons are extracted from the chamber by a grid system such as shown in FIG. 5A. The extracted electrons are consumed and prevented from re-entering the chamber by a circuit such as shown in FIG. 5B. The elongated gas ions are subjected to a thermal heat zone to cause gas ignition, releasing thermal energy with explosive force. During ionic gas combustion, highly energized and stimulated atoms and atom nuclei collide and explode during thermal excitation. The hydrogen fracturing process occurring sustains and maintains a thermal zone, at a temperature in excess of normal hydrogen/oxygen combustion temperature, to wit, in excess of 2500.degree. F. To cause and maintain atomic elongation depicted in FIG. 3C before gas ignition, a voltage intensifier circuit such as shown in FIG. 4 is utilized as a current restricting voltage source to provide the excitation voltage applied to the resonant cavity. At the same time the interconnected electron extractor circuit, FIG. 5B, prevents the reintroduction of electrons back into the system. Depending on calculated design parameters, a predetermined voltage and frequency range may be designed for any particular application or physical configuration of the apparatus.

In the operation of the assembly, the pulse train source for the gas resonant cavity shown at 2 and 3 in FIG. 1 may be derived from a circuit such as shown in FIG. 4. It is necessary in the final electron extraction that the frequency with which electrons are removed from the system by sequenced and synchronized with the pulsing of the gas resonant cavity. In the circuit of FIG. 5B, the coordination or synchronization of the circuit with the circuit of FIG. 4 may be achieved by interconnecting point "A" of the gate circuit of FIG. 5B to coordinate point "A" of the pulsing circuit of FIG. 4.

Together the hydrogen injector assembly 4 and the resonant cavity assemblies 2, 3 form a gas injector fuel cell which is compact, light in weight and design variable. For example, the hydrogen injector system is suited for automobiles and jet engines. Industrial applications require larger systems. For rocket engine applications, the hydrogen gas injector system is positioned at the top of each resonant cavity arranged in a parallel cluster array. If resonant cavities are sequentially combined in a parallel/series array, the hydrogen injection assembly is positioned after the exits of said resonant cavities are combined.

From the outline of physical phenomena associated with the process described in Table 1, the theoretical basis of the invention considers the respective states of molecules, gases and ions derived from liquid water. Before voltage stimulation, water molecules are randomly dispersed throughout water within a container. When a unipolar voltage pulse train such as shown in FIG. 3A (53a xxx 53n) is applied, an increasing voltage potential is induced in the molecules, gases and/or ions in a linear, step-like charging effect. The electrical field of the particles within a chamber including the electrical field plates increases from a low energy state (A) to a high energy state (J) in a step manner following each pulse-train as illustrated in FIG. 3A. The increasing voltage potential is always positive in direct

relationship to negative ground potential during each pulse. The voltage polarity on the plates which create the voltage fields remains constant. Positive and negative voltage "zones" are thus formed simultaneously.

In the first stage of the process described in Table 1, because the water molecule naturally exhibits opposite electrical fields in a relatively polar configuration (the two hydrogen atoms are positively electrically charged relative to the negative electrically charged oxygen atom), the voltage pulse causes initially randomly oriented water molecules in the liquid state to spin and orient themselves with reference to positive and negative poles of the voltage fields applied. The positive electrically charged hydrogen atoms of said water molecule are attracted to a negative voltage field; while, at the same time, the negative electrically charged oxygen atoms of the same water molecule are attracted to a positive voltage field. Even a slight potential difference applied to the inert, conductive plates of a containment chamber will initiate polar atomic orientation within the water molecule based on polarity differences.

When the potential difference applied causes the orientated water molecules to align themselves between the conductive plates, pulsing causes the voltage field intensity to be increased in accordance with FIG. 3A. As further molecular alignment occurs, molecular movement is hindered. Because the positively charged hydrogen atoms of said aligned molecules are attracted in a direction opposite to the negatively charged oxygen atoms, a polar charge alignment or distribution occurs within the molecules between said voltage zones, as shown in FIG. 3B. And as the energy level of the atoms subjected to resonant pulsing increases, the stationary water molecules become elongated as shown in FIG. 3C. Electrically charged nuclei and electrons are attracted toward opposite electrically charged voltage zones--disrupting the mass equilibrium of the water molecule.

In the first stage, as the water molecule is further exposed to a potential difference, the electrical force of attraction of the atoms within the molecule to the electrodes of the chamber also increases in intensity. As a result, the covalent bonding between said atoms which forms the molecule is weakened and ultimately terminated. The negatively charged electron is attracted toward the positively charged hydrogen atoms, while at the same time, the negatively charged oxygen atoms repel electrons.

Once the applied resonant energy caused by pulsation of the electrical field in the cavities reaches a threshold level, the disassociated water molecules, now in the form of liberated hydrogen, oxygen, and ambient air gases begin to ionize and lose or gain electrons during the final stage in the injector assembly. Atom destabilization occurs and the electrical and mass equilibrium of the atoms is disrupted. Again, the positive field produced within the chamber or cavity that encompasses the gas stream attracts negatively charged ions while the positively charged ions (and/or hydrogen nuclei) are attracted to the negative field. Atom stabilization does not occur because the pulsating voltage applied is repetitive without polarity change. A potential of approximately several thousand volts triggers the

ionization state.

As the ionized particles accumulate within said chamber, the electrical charging effect is again an incremental stepping effect that produces an accumulative increased potential while, at the same time, resonance occurs. The components of the atom begin to "vibrate" at a resonant frequency such that an atomic instability is created. As shown in FIG. 3D, a high energy level is achieved, which then collapses resulting in the release of thermal explosive energy. Particle impact occurs when liberated ions in a gas are subjected to further voltage. A longitudinal cross section of a gas resonant cavity is shown in FIG. 2A. To promote gas ionization, electromagnetic wave energy such as a laser or photon energy source of a predetermined wave length and pulse-intensity is directed to and absorbed by the ions forming said gas. In the device of FIG. 2A, semiconductor optical lasers 20a-20p, 20xxx surround the gas flow path. In the device of FIG. 2B, photon energy 20 is injected into a separate absorption chamber 21. The incremental stimulation of nuclei to a more highly energized state by electromagnetic wave energy causes electron deflection to a higher orbital state. The Pulse rate as well as intensity of the electromagnetic wave source is varied to match the absorption rate of ionized particles to produce the stepped incremental increase in energy. A single laser coupled by means of fiber optic light guides is an alternative to the plurality of lasers shown in FIG. 2B. Continued exposure of the gas ions to different forms of wave energy during voltage stimulation maintains individual atoms in a destabilized state and prevents atomic stabilization.

The highly energized gas ions are thermally ignited when said combustible gas ions pass from injector 4 and enter into and pass through a nozzle, 10 in FIG. 2B, or an optical thermal lens assembly such as shown in FIG. 2C. In FIG. 2C, the combustible gas ions are expelled through and beyond a quenching circuit, 30, and reflected by lenses, 31 and 32, back and forth through a thermal heat zone, 33, prior to atomic breakdown beyond exiting through a final port, 34. A quenching circuit is a restricted orifice through which the particle stream passes such that flashback does not occur. (See my application Ser. No. 835, 564, supra.) The deflection shield or lens, 31, superheats beyond 3,000.degree. F. and the combustible gas ions passing through said exiting-ports are regulated to allow a gas pressure to form inside said thermal zone. The energy yield is controlled by varying the applied voltage, or Pulse-train since said thermal-lens assembly is self-adjusting to the flow-rate of said ionized and primed gases. The combustible ionic gas mixture is composed of hydrogen, oxygen, and ambient air gases. The hydrogen gas provides the thermal explosive force, the oxygen atoms aid the gas thermal ignition, and the ambient air gases retard the gas thermal ignition process to a controllable state. As the combustible gas mixture is exposed to a voltage pulse train, the stepped increasing voltage potential causes said moving gas atoms to become ionized (losing or gaining electrons) and changes the electrical and mass equilibrium of said atoms. Gases that do not undergo the gas ionization process may accept the liberated electrons (electron entrapment) when exposed to light or photon stimulation. The electron extractor grid circuit, FIGS. 5A and 5B, is applied to the assembly of FIG. 2A or FIG. 2B, and restricts electron replacement. The extractor grid, 56,

is applied adjacent to electric field producing members, 44 and 45, within the resonant cavity. The gas ions incrementally reach a critical-state which occurs after a high energy resonant state. At this point the atoms no longer tolerate the missing electrons, the unbalanced electrical field, and the energy stored in the nucleus. Immediate collapse of the system occurs and energy is released as the atoms decay into thermal explosive energy.

The repetitive application of a voltage pulse train (A through J of FIG. 3A) incrementally achieves the critical state of said gas ions. As the gas atoms or ions (la xxx ln) shown in FIG. 3C become elongated during electron removal, electromagnetic wave energy of a predetermined frequency and intensity is injected. The wave energy absorbed by the stimulated gas nuclei and electrons causes further destabilization of the ionic gas. The absorbed energy from all sources causes the gas nuclei to increase in energy state, and induces the ejection of electrons from the nuclei.

To further stimulate the electron entrapment process beyond the atomic level (capturing the liberated electrons during the hydrogen fracturing process) the electron extractor grid (as shown in FIG. 5A) is placed in spaced relationship to the gas resonant cavity structure shown in FIG. 2A. The electron extractor grid is attached to an electrical circuit (such as shown in FIG. 5B) that allows electrons to flow to an electrical load, 55, when a positive electrical potential is placed on the opposite side of said electrical load. The electrical load may be a typical power consuming device such as a light bulb or resistive heat producing device. As the positive electrical potential is switched on or pulse-applied, the negative charged electrons liberated in the gas resonant cavity are drawn away and enter into resistive load where they are consumed and released as heat or light energy. The consuming electrical circuit can be directly connected to the gas resonant cavity positive electrical voltage zone. The incoming positive wave form applied to resonant cavity voltage zone through a blocking diode is synchronized with the pulse train applied to the gas resonant cavity by the circuit of FIG. 4 via alternate gate circuit. As one pulse train is gated "ON," the other pulse train is switched "OFF." A blocking diode directs the electron flow to said electrical load while resistive wire prevents voltage leakage during pulse train "ON" time.

The electron extraction process is maintained during gas flow-rate change by varying the trigger pulse rate in relationship to applied voltage. The electron extraction process also prevents spark-ignition of the combustible gases traveling through the gas resonant cavity because electron build-up and potential sparking is prevented.

In an optical thermal lens assembly or thrust-nozzle, such as shown in FIG. 2C, destabilized gas ions (electrically and mass unbalanced gas atoms having highly energized nuclei) can be pressurized during spark-ignition. During thermal interaction, the highly energized and unstable hydrogen gas nuclei collide with the highly energized and unstable oxygen gas nuclei and produce thermal explosive energy beyond the gas burning stage. Other ambient air gases and ions not otherwise consumed limit the thermal explosive process.

Variations of the process and apparatus may be evident to those skilled in the art.

USP 4,798,661

Gas Generator Voltage Control Circuit

Stanley Meyer

Abstract ~

A power supply in a system utilizing as a source of fuel a generator for separating hydrogen and oxygen gasses from natural water and having the capabilities to control the production of gasses by varying the amplitude of the voltage and/or the pulse repetition rate of the voltage pulses applied to a pair of plate excitors in a vessel of natural water, comprising a sequence of circuitry operative to limit the current of a d.c. potential to a minimum value relative to the magnitude of the voltage applied to the plate excitors. The circuits each function up to a given magnitude of voltage to inhibit and curtail the flow of electrons from the plate exciter having the negative voltage potential applied thereto. The first circuit operative from a first magnitude of voltage comprises converting the voltage potential applied to the plate excitors to a unipolar pulse voltage d.c. of a repetitive frequency. The next circuit varies the duty cycle of the unipolar pulse voltage d.c.; followed by rearranging the application of the voltage to the excitors to individual excitors each having the voltage applied thereto independently of the other plate excitors in the generator. The next circuit comprises an electron inhibitor that prevents the flow of electrons; the circuit being in the terminal line between the negative plate exciter and ground. In those applications of the generator wherein excessively high voltage is to be applied to the plate excitors for a very high yield of gasses, a second electron inhibitor of a unique structure is serially connected with the first electron inhibitor. The second named inhibitor having a relatively fixed value and the first inhibitor connected in series is variable to fine tune the circuits to eliminate current flow.

Claims

I claim:

In a generator for producing a mixture of hydrogen and oxygen and other dissolved gas from natural water which generator includes at least a pair of plate excitors within a water containing vessel, a variable voltage source for applying a pulsating predetermined

potential difference between the plates and wherein the rate of production of the mixture of gasses is controlled by varying at least one of the amplitude of the voltage and the pulse repetition rate of the pulsating potential difference applied to the plate excitors.

The variable voltage source includes a means for restricting the current flow between the plate excitors to a minimum value relative to a predetermined potential difference applied to the plates, the improvement in the means for restricting said current flow comprising: variable voltage source means for converting an input voltage potential to unipolar d.c. voltage pulses that are applied to the exciter plates and have a pulsating potential difference when measured from an arbitrary ground.

There is also a means for regulating the voltage pulses in a repetitive frequency to inhibit the current flow caused by electron leakage between the plate excitors resulting from the amplitude of the applied voltage potential whereby said current flow is inhibited from exceeding a first minimum level.

The input voltage is an alternating current voltage and said circuit for converting said alternating current voltage to unipolar d.c. voltage pulses further comprises, means for varying the frequency of said alternating current voltage input to further inhibit electron leakage upon increasing the amplitude of the voltage applied to the plate excitors to a second level.

The variable voltage source is an alternating current voltage for converting alternating current voltage to unipolar d.c. voltage pulses also comprises a transformer having primary and secondary windings, and a rectifier circuit connected across said secondary windings.

The transformer further includes variable inductive means for varying the output frequency of the voltage induced in said secondary winding to further inhibit electron leakage upon increasing the amplitude of the voltage applied to the plate excitors to a third level.

The variable voltage source also has a pulse forming circuit for varying the duty cycle of the unipolar d.c. voltage pulses to a predetermined repetition rate to inhibit electron leakage upon increasing the amplitude of the voltage applied to the plate excitors to a fourth level.

A means is further provided to vary the amplitude of the duty cycle pulses to vary the rate of production of the hydrogen and oxygen gasses, further comprising means for correlating the repetition of said duty cycle pulses with the amplitude of said duty cycle pulses to provide an average amplitude pulse below the amplitude level causing electron leakage.

The variable voltage source of the generator of claim 5 wherein said varying of the duty cycle of said unipolar d.c. voltage pulses to inhibit electron leakage is a periodic varying

and aperiodic varying.

It also has circuit means for varying the amplitude of said duty cycle pulses from a first gradient level to a second gradient level, and a means for varying the duty cycle pulses to a plurality of distinctive gradient levels.

It also has circuit means for nonuniformly varying the duty cycle pulses to a plurality of distinctive gradient levels.

The unipolar d.c. voltage pulses in the duty cycle is non-repetitive.

Varying of the duty cycle of said pulses to inhibit electron leakage comprise circuit means for varying the amplitude from a first gradient minimum level to a plurality of gradient levels. Gradient levels of amplitude represent demand functions for a utilitarian device.

The circuit further comprises means for varying the frequency of the alternating voltage including a transformer having a primary winding and a secondary winding, and wherein said means is connected to the input of the primary of said transformer.

A pair of plate excitors are spatially positioned in natural water with a physical distance there between of a wavelength to that of a particular frequency of the voltage back and forth motion between said exciter plates, and means for varying said unipolar d.c. voltage pulses in frequency to match the wavelength distance of the pair of plate excitors.

The pair of plate excitors are spatially positioned in the water with a physical distance there between of a wavelength to that of a particular frequency of the voltage back and forth motion between said exciter plates, and pulse forming means for varying the duty cycle of said unipolar d.c. voltage; and a means for varying said duty cycle pulse in repetition rate to match the wavelength distance of said pair of plate excitors.

The pair of plate excitors are spatially positioned in water with a physical distance therebetween of a wavelength to that of particular frequncey of the voltage back and forth motion between the exciter plates, and pulse forming means for varying the duty cycle of said unipolar d.c. voltage ; and a means for varying the duty cycle pulse in repetition rate to match the wavelength distance of the pair of plate excitors, and means for varying the amplitude of said duty cycle pulses to a minimum level to maintain resonance between said pair of plate excitors; and a means for varying the repetition frequency of said unipolar d.c. voltage pulses to vary the rate of generation of gasses.

The negative plate has a ground and an electron inhibiting resistive element connected between the negative plate and ground, providing a means to vary the resistive element with a variable resistor to maximize electron inhibition.

The variable voltage source of the generator of claim 28 wherein the amplitude of the voltage induced in the secondary is dependant on the number of turns in said secondary

winding.

There is a circuit component means for converting an input voltage to unipolar d.c. voltage pulses of a repetitive frequency to inhibit electron leakage upon varying the amplitude of the applied voltage above a first predetermined amplitude level, a pulse forming circuit for varying the duty cycle of said unipolar d.c. voltage pulses to a predetermined repetition rate to inhibit electron leakage upon varying the amplitude of the voltage beyond a second level of amplitude circuit means for varying the frequency of said unipolar d.c. voltage pulses to inhibit electron leakage upon varying the amplitude of the applied voltage above a third predetermined level, a ground and a variable resistive element connected between the plate exciter having a negative voltage applied it and ground to limit electron leakage upon varying the amplitude of the voltage beyond a fourth level of amplitude, a pair of plates and a resistive material sandwiched therebetween connected to said plate exciter having said negative voltage connected thereto and the end of the variable resistor opposite to the ground connection, to limit electron leakage upon varying the amplitude of said voltage applied to said plates bea fifth level.

Description ~

BACKGROUND AND CROSS REFERENCES

The phenomena of physics was discovered that the hydrogen atoms in the water molecule will take on a positive charge whereas the oxyxygen atom in the water molecule takes on a negative charge when the water molecule is exposed to an electrical voltage. The two hydrogen positive charged atoms and the one oxygen negative charged atoms, in magnitude, are in a state of equilibrium .

In my co-pending patent application, Ser. No. 302,807, now abandoned for Hydrogen Generator, the above noted principle of polarization is utilized. The simultaneous application of a positive voltage pulse to one plate exciter and a negative polarized voltage pulse to the other plate exciter in a vessel of natural water, will form polarized voltage electrical zones around the plates of a respective polarity. The positive voltage plate exciter zone attracts the negative charged atoms of the water molecule and the negative voltage plate exciter zone attracts the positive charged hydrogen atoms of the water molecule.

The opposing attractive forces causes the hydrogen and oxygen atoms to disassociate from the water molecule; and thereby, release the hydrogen and oxygen gasses. In that natural water is utilized in the generator and that natural water contains a considerable percentage of ambient air, ambient air gas will also be released similarly to the oxygen and hydrogen gasses from the water molecule.

The above described process is apparently not a chemical reaction process such as in

Faraday's Laws. In that process electrolyte is added to distilled water to draw current. The reaction of the electrolyte with that of the corrosive electrodes releases the hydrogen and oxygen gasses.

Characteristically, Faraday's Laws requires:

"The rate of deomposition of an electrolyte is dependant on current and independant of voltage. xxx will depend on current regardless of voltage, provided the voltage exceeds a minimum for a potential."

In the voltage dependant/current restricted process of my co-pending patent application, the disassociation of the hydrogen and oxygen atoms from the water molecule, is attributed to the physical force attraction of the polarized zones adjacent the plate excitors on the charged hydrogen and oxygen atoms having a polarity opposite to that of the polarized zone.

This physical force is exemplified in my co-pending patent application, Ser. No. 422,594, filed Sept. 24, 1982, now abandoned for Hydrogen Generator Resonant Cavity, wherein the principle of physics that physical motion of an element between spatially positioned structures will resonate if the distance between the structures, in wavelengths, is matched to the frequency of the force causing the physical motion, is utilized in a practical and useful embodiment.

The d.c. voltage with current restricted, applied to the pair of plate excitors spatially positioned in a vessel of natural water, is pulsed. The pulsing voltage on the plate excitors applying a physical force is matched in repetition rate to the wavelength of the spacing of the plate excitors. The physical motion of the hydrogen and oxygen charged atoms being attracted to the opposite polarity zones will go into resonance. The self sustaining resonant motion of the hydrogen and oxygen atoms of the water molecule greatly enhances their disassociation from the water molecule.

In my co-pending patent application, Ser. No. 411,977, filed Aug. 25, 1982, for Controlled Hydrogen Gas Flame, the gasses separated from the water, the hydrogen and oxygen together with the ambient air non-combustible gasses, are mixed as they are released by the generator. The mixture of gasses are collected in a pressure chamber in the generator and thereafter expelled through a nozzle having a port configuration with openings dependant on the mixture of gasses. The nozzle is connected directly to the collection chamber and ignited.

The gas mixture has a reduced velocity and temperature of the burning flame from that which would occur solely with a hydrogen and oxygen mixture. To further control the flame, there is added to the mixture other non-combustible gasses in a controlled amount.

Accordingly, the nozzle ports are related to the temperature and velocity of the flame. The several ports will accommodate flames of greater size without the danger of flashback or blowout such as would happen with a single flame.

This physical force is further demonstrated in the plate separation phenomena of the first aforementioned co-pending patent application. Simply, the closer the spacing between the plate excitors the greater the attractive force of the opposite polarity plate excitors on the charged hydrogen and oxygen atoms of the water molecule. With a given spacing, an increase in the magnitude of the voltage applied to the plate excitors will result in an increase in the rate of production of the gasses. With a voltage of a fixed amplitude a variation in the plate exciter spacing will affect the rate of production of the gasses. An increase in the spacing will result in less generation, whereas a decrease in the spacing of the plate excitors will result in an increase in gasses.

THEORETICAL ANALYSIS

The electrical phenomena of a positive potential voltage applied to one plate exciter and the application of a negative voltage potential applied to another plate exciter positioned in a vessel of water, may now be considered.

Distilled water, like air, having no conductive medium, will inherently inhibit electron leakage. The magnitude of the applied voltage to the pair of plate excitors is correlated with the physical force on the electron movement. The magnitude of the initial force and the magnitude of the force to leak the electrons, and thereafter cause current flow, may be calculated or more readily empirically determined.

A small amplitude negative voltage applied to the negative plate exciter, will cause a physical disturbance to the movement of the floating electrons. However, the small amplitude voltage is insufficient to cause the electrons to leak and enter the attractive field force area of the positive plate. As the magnitude of the applied voltage is increased, the disturbance to the movement of the electrons is increased. With a further increase in the amplitude of the voltage applied to the plate excitors -- to a limiting level, the resistance of the medium to the attractive force of the opposite polarity exciter plate on the electron leakage will be overcome.

As the electron leakage enhances, the flow of the electrons to the positive plate exciter gradually increases as they enter the attractive field of the positive plate. Upon attaining a heavy flow of electrons reaching the positive plate attractive area, arcing will occur. An electrical arc is formed between the two plate excitors. When this occurs a direct short conductive flow of current will flow across the plates.

The electrical arc between the pair of plate excitors will form a direct line of conductivity;

current will flow unrestricted. Upon the electron leakage attaining a direct short, the current is at a maximum. The voltage being subjected to the current takeover decreases gradually upon initial electron leakage and thereafter drops as the flow of electrons increases. When the electron leakage arcs over to the positive potential plate exciter, the voltage will drop to zero.

As stated above, the spacing between the pair of plate excitors in a vessel of water having a d.c. voltage applied, is correlated with the gas production rate. The closer the spacing between the pair of plate excitors, the greater the yield of gas generated. If the spacing of the pair of plate excitors is altered to a minimum spacing level, the attractive force of the positive polarity plate will overcome the resistance of the water medium. Electron leakage will occur and from gradually to rapidly increase until arcing between the pair of plate excitors forms a direct path and consequently a direct short.

The distance between the plates and the amplitude of the voltage applied, each independantly affect the other. The two variable factors are interrelated; the one being variable relative to the other. The spacing being inversely proportional to the amplitude of the voltage.

SUMMARY OF THE INVENTION

In the utilization of a generator for the separation of the hydrogen and oxygen gasses from water; and the production of the gasses is varied by varying the amplitude of the voltage and/or the pulse rate--duty cycle of the pulsed d.c. voltage applied to the plate excitors in a vessel of water.

The present invention comprises a power supply with the applied voltage to the pair of plate excitors variable from zero upward to extremely high voltages; but yet, that inhibits the electron leakage.

The power supply of the present invention includes circuitry for an increased production of the generation of the gasses through varying the amplitude of the voltage applied to the plate excitors. The circuitry includes means and components for restriction of the electron leakage (current flow).

The applied voltage to the pair of plate excitors is a unipolar pulse d.c. voltage of a repetitive frequency. Alternate power circuitry is utilized. In the first embodiment the input voltage is alternating current fed to a bridge rectifier; whereas in the second preferred embodiment, the input voltage is direct current applied to the primary of a rotating field secondary winding.

With a very low level of amplitude of the voltage applied to the plate excitors, no electron leakage from the negative potential plate exciter to the positive potential attractive field

will occur. An amplitude of the voltage above a first forceful level will cause electron leakage. The circuitry of the invention overcomes the electron leakage with the application to the plate excitors the aforesaid pulsed d.c. voltage.

An increase in amplitude of the applied voltage above a second level, will result in electron leakage.

To obtain additional gas production without electron leakage, circuitry in the power supply prevents electron leakage by varying the duty cycle of the pulsed d.c. voltage applied to the plate excitors. The varying levels of amplitude of the duty cycle pulses effectively restrains the electrons from the B+ attractive field.

The pulsating d.c. voltage and the duty cycle pulses have a maximum amplitude of the level that would cause electron leakage. Varying of the amplitude to an amplitude of maximum level to an amplitude below the maximum level of the pulses, provide an average amplitude below the maximum limit; but with the force of the maximum limit.

In most instances of a practical application of the hydrogen and oxygen generator the pair of plate excitors will be several pairs connected in parallel. There will be one terminal to the positive voltage and another terminal to the negative voltage. A further expediency to eliminate electron leakage is attained by eliminating the large surface area probability of stray electrons.

It is noted that the first two circuit components and the multiple connections for restricting electron leakage relates to the plate exciter having the negative voltage applied thereto. That is the circuitry overcomes the attractive force of the B+ potential field. Additional circuitry is provided for very high yield gas production above the aforesaid upper limits, in the negative applied voltage plate exciter.

A circuit is included in the negative plate exciter that practically eliminates electron flow; that is, the electrons are prevented from reaching the negative plate exciter and thereby eliminating the affect of the attractive force of the B+ field. A current limiting resistor connected between the negative plate exciter and ground, prevents current flow--electron leakage to the the opposite polarity field.

The circuit comprises a limiter resistor connected between the negative plate and ground that blocks current flow--electron leakage to the negative plate. The practical elimination of the current has no affect on the voltage, in the preferred embodiment, since there is no voltage drop.

In a sophisticated embodiment, the limiting resistor comprises a unique structure of poorly conductive material having a resistive mixture sandwiched therebetween. A second resistor

of the variable type is serially connected to the unique limiter for tuning. The value of the limiting resistance is determined by the current passing therethrough. The variable is employed until the ammeter reads zero or close to zero as possible.

The sandwich type limiter is varied in value by controlling the mixture of resistive material to binder.

The circuitry and expedients to inhibit the electron leakage at all levels of the magnitude of the voltage applied to the plate excitors is a sequence of steps and functions operable from predetermined circuit components. The order of the circuit functions is set and preferably not altered; however, each of the specific variables can be varied independantly and varied with interrelated function to the other.

The phenomena that the spacing between two objects is related to the wavelength of a physical motion between the two objects is utilized herein. A relatively small increase in amplitude will yield an output several magnitudes greater when the motion of the water molecule is moving to and fro with a repetition rate to match the resonant length of the spacing between the pair of excitors.

OBJECTS OF THE INVENTION

It is a principle object of the present invention to provide:

a power supply for a hydrogen and oxygen gas generator wherein varying the voltage amplitude varies the rate of generation of the gasses generated.

such a power supply that includes circuitry to permit voltage to be varied in amplitude with current restrict to a minimum relative to the amplitude of the voltage.

such a power supply for a hydrogen and oxygen generator wherein the electron leakage between the plate excitors is inhibited.

a power supply for a hydrogen and oxygen generator including circuitry for a unipolar pulse d.c. voltage of a repetitive frequency from either an alternating or a direct current input.

a power supply having varying levels of voltage indicative of varying levels of gas generation that is programmable with a utilitarian device, particularly, when the generator has excitors spaced a distance in wavelength matched by the voltage pulse frequency.

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is an overall illustration of the present invention in a preferred embodiment; the components shown partly in block schematic and partly pictorially.

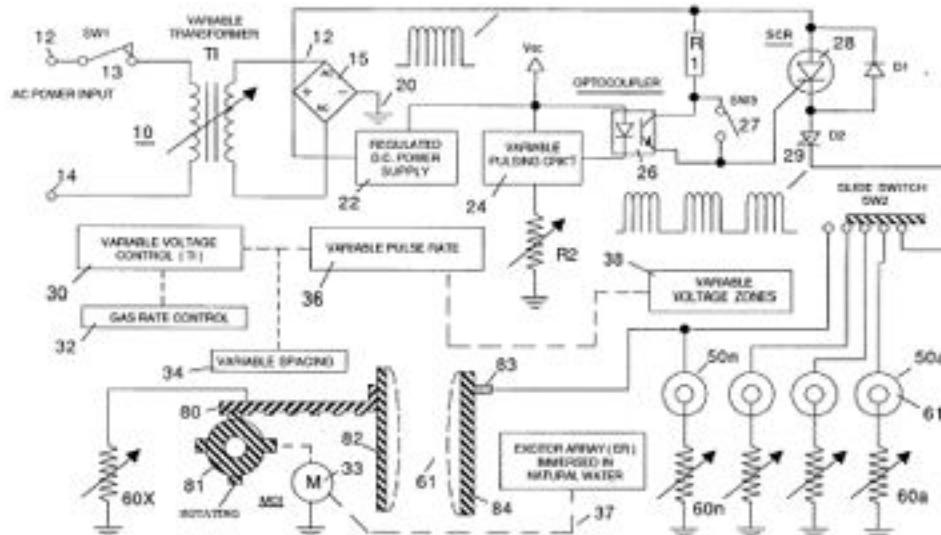
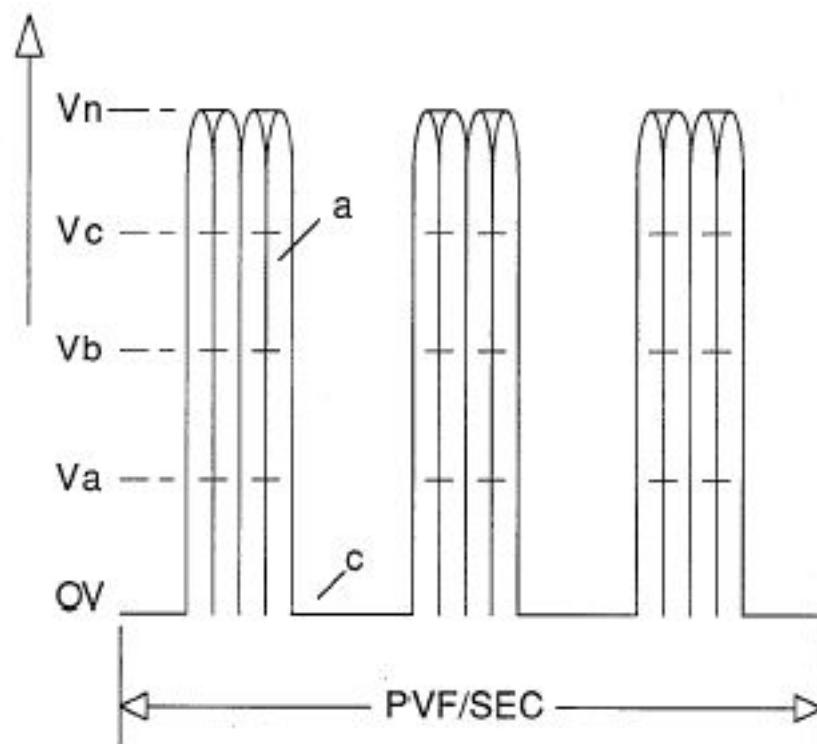


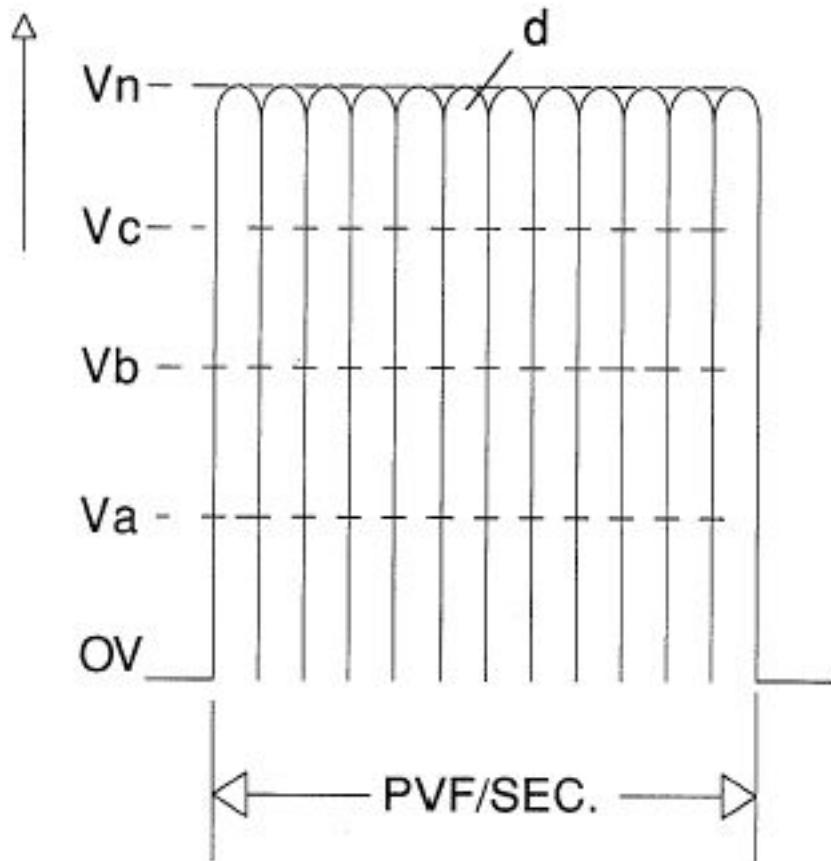
FIGURE 1

FIG. 2 is a first waveform illustrating the unipolar pulse d.c voltage of repetitive frequency with a uniform duty cycle.



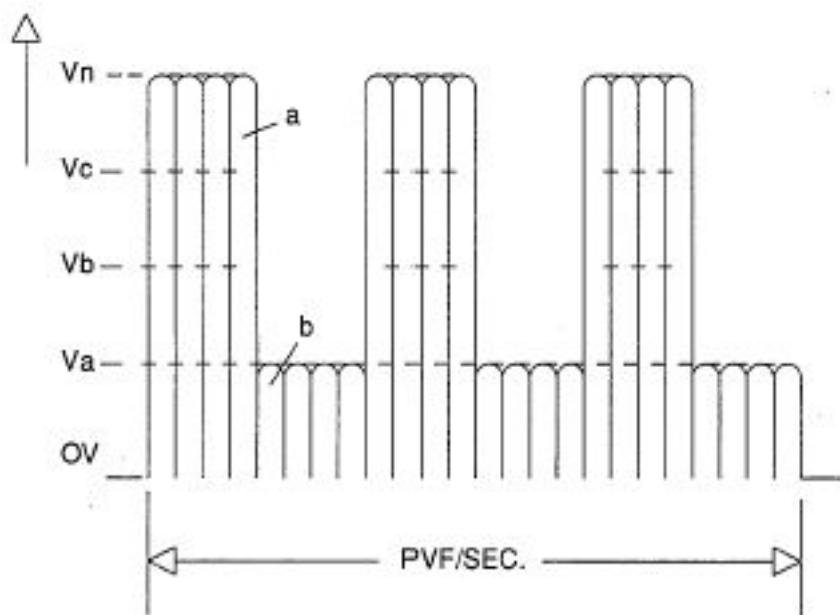
a) HIGH GAS-YIELD
c) OFF STATE

FIG. 3 illustrates the unipolar pulse voltage with a continuous repetitive frequency.



d) MAXIMUM GAS-YIELD

FIG. 4 illustrates the unipolar pulse voltage of a repetitive frequency having a uniform duty cycle from a low gradient level to high gradient level; FIG. 4A illustrates the duty cycle as being non-uniform and between gradient levels; FIG. B illustrates the duty cycle comprising varying gradient levels and of non-uniform repetition; and FIG. 4C illustrates the varying gradient levels as being uniform.



a) HIGH GAS-YIELD

b) LOW GAS-YIELD

FIGURE 4

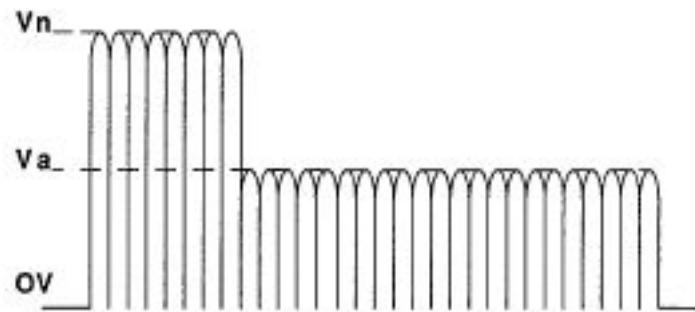


FIGURE 4A

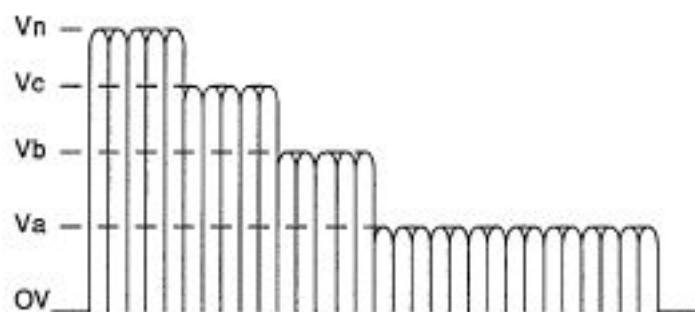


FIGURE 4B

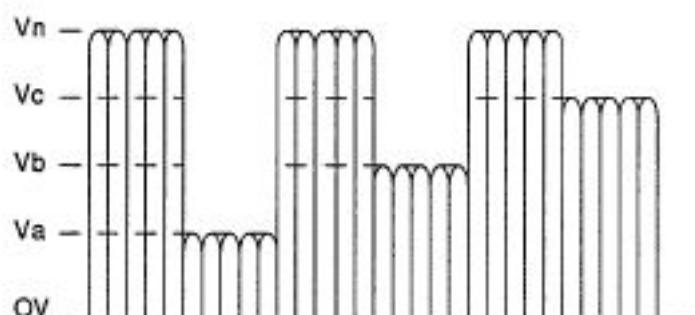


FIGURE 4C

FIG. 5 illustrates partly schematic and partly in block the pulse frequency generator from a direct current voltage source.

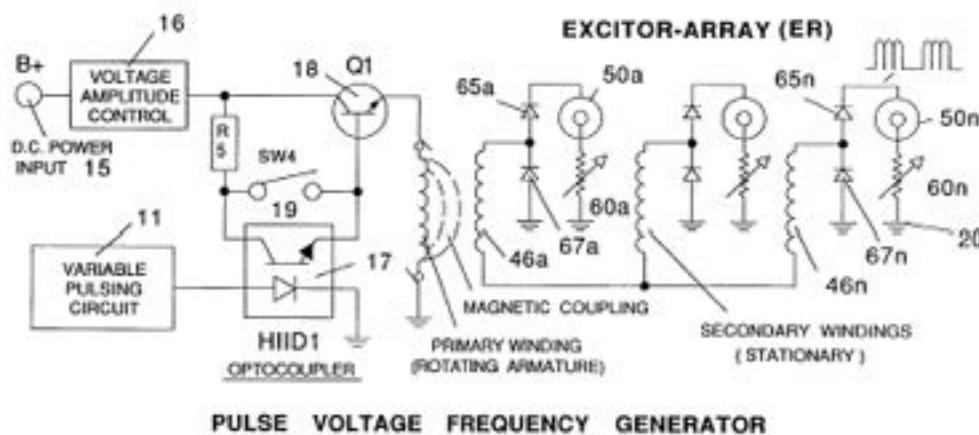


FIGURE 5

FIG. 6 is a schematic of the circuitry for programming the varying levels of voltage to practical applications.

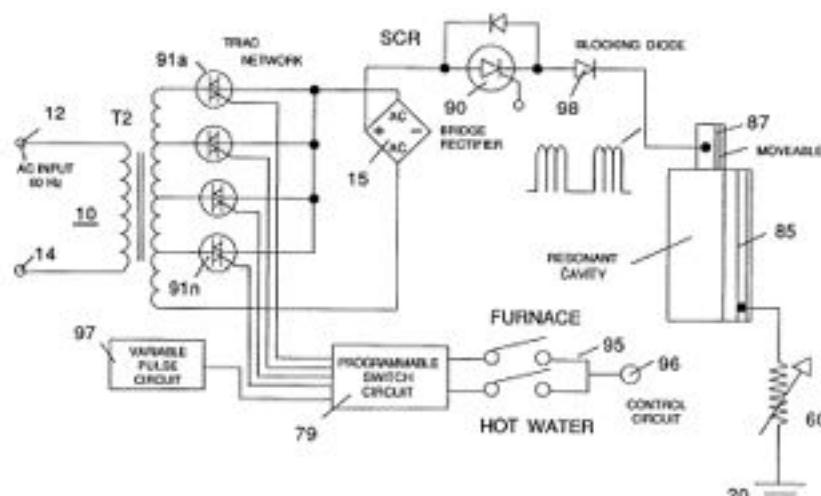


FIGURE 6

FIG. 7 is a cross-sectional perspective of a multiple layer sandwich resistive element for inhibiting electron leakage.

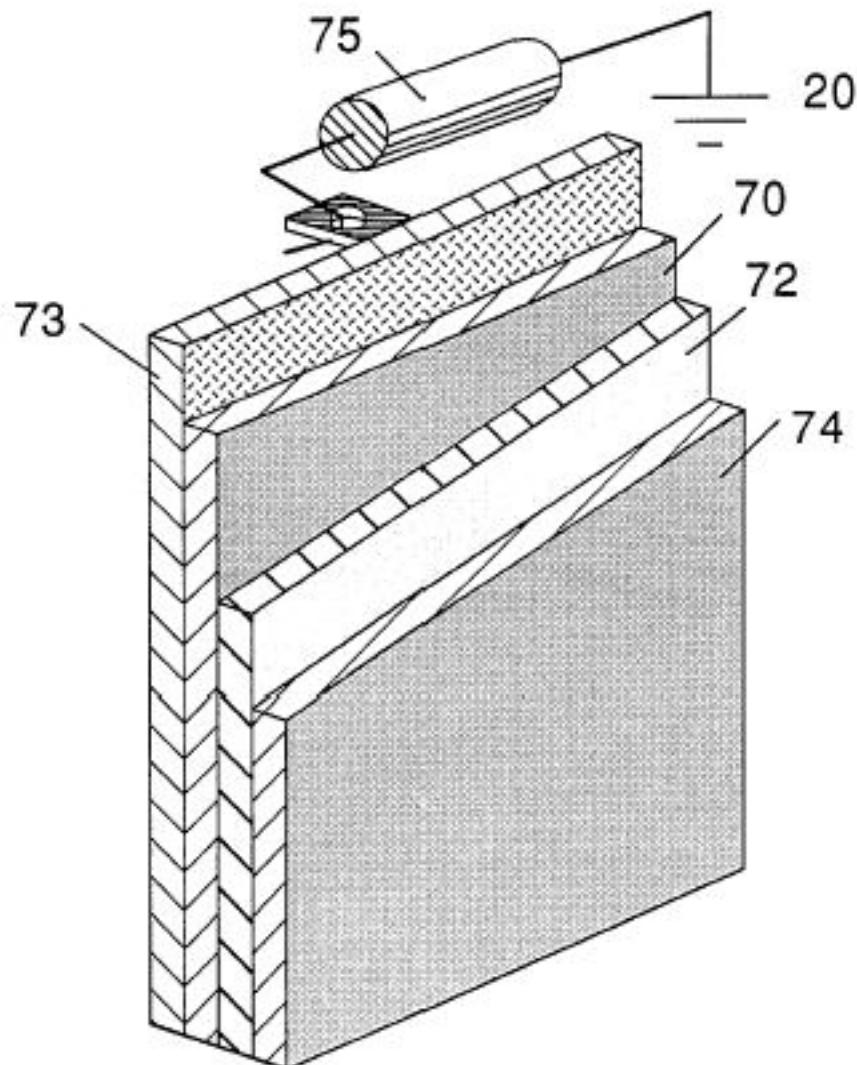


FIGURE 7

FIG. 8 is a graphical illustration of the varying limitations of voltage amplitude for inhibiting electron leakage.

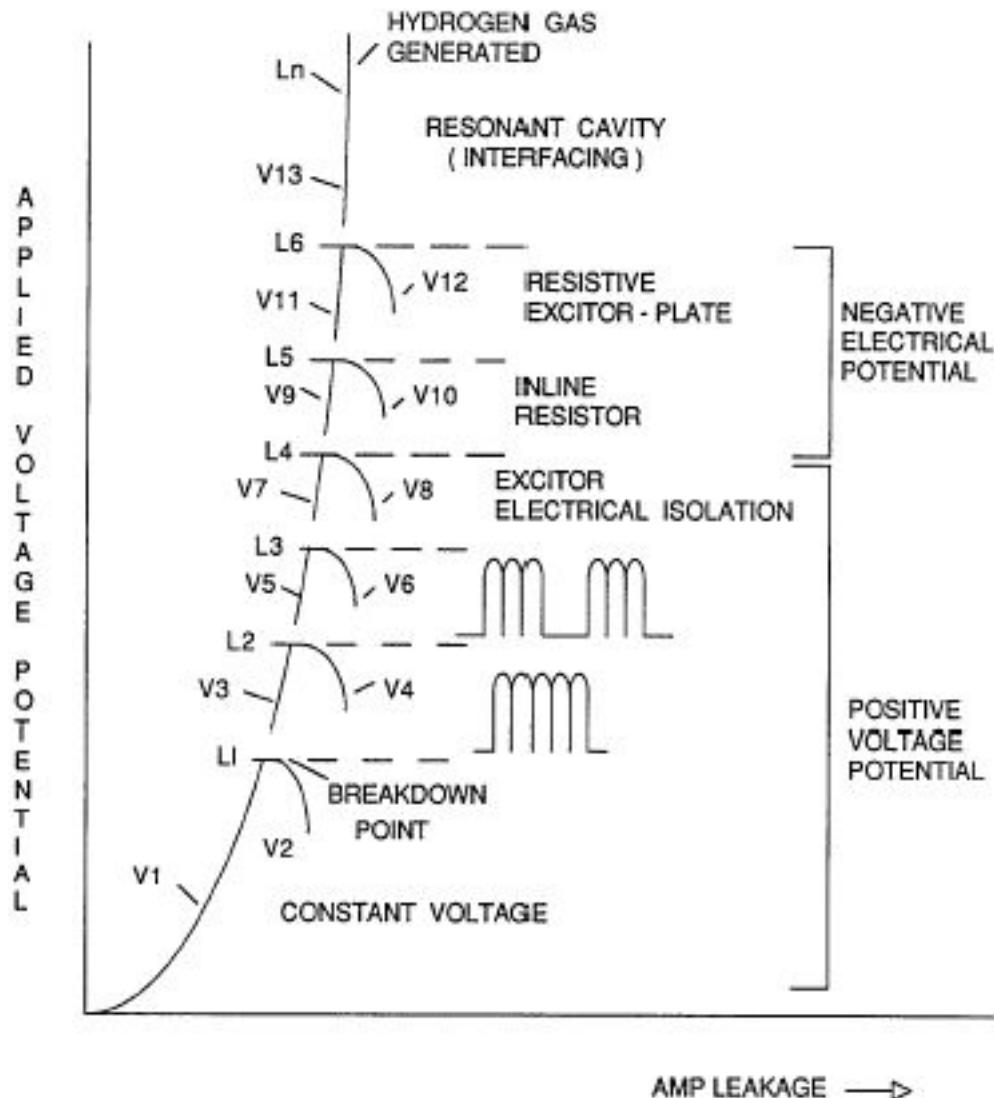


FIGURE 8

DETAILED DESCRIPTION

Referring to the drawings and in particular to FIG. 1, there is illustrated the present invention in its preferred embodiment of a power supply for the aforementioned hydrogen and oxygen gas generator, providing variable amplitude voltage with inhibited electron leakage.

The alternating current rectifier circuit 10 comprises input alternating current terminals 12 and 14. Switch 13 is a typical on/off switch. Transformer 10 is an inductive primary and secondary transformer connected to a bridge rectifier 15. The inductive field 11 of the transformer 10 is variable in a known manner to yield a variable frequency alternating voltage/current to the primary winding. The bridge 15 arms are connected across the input

of the secondary winding of the transformer 10. The upper and lower arms are connected across the extreme ends of the secondary winding and the left hand arm is connected to the output of the rectifier 15. The right arm is connected to ground 20. The rectifier inverts the negative swing of the alternating current and thereby results in an output voltage pulse of a frequency twice that of the input frequency of the alternating current voltage applied to the terminals 12 and 14.

It is appreciated that if the alternating current voltage is varied in frequency by the variable inductive field 11, the output frequency across the bridge 15 will still be twice the frequency of the alternating voltage across the secondary of the transformer secondary winding 10.

The power supply of FIG. 1 includes a variable circuit 30 for varying the amplitude of the rectified voltage by rectifier 15. The variable voltage circuit, in turn, is directly controlled by the gas rate function separately, sequential, and together with the phenomena of a resonant cavity.

The waveform output of the bridge is shown as a unipolar d.c. voltage pulse of a repetitive frequency. It is noted that the pulse voltage is not filtered and the plate effect is utilized.

As stated, a voltage with an amplitude below the minimum level for example, with a given size apparatus, 2.5 volts (L-1 of FIG. 8) when applied to the pair of plate excitors, is insufficient amplitude to force the electrons to leak from the negative plate exciter.

The hydrogen and oxygen gasses will be separated from the water at the low level of voltage amplitude; and the gasses generated will also be at the minimum.

Above the minimum level (L-1 of FIG. 8) of amplitude, the applied voltage will have a sufficient force to agitate and cause movement of the electrons around the negative plate exciter. As a consequence electron leakage would take place.

To overcome the forceful effect on the electrons around the negative plate exciter, but apply a voltage of increased amplitude for an increase in gas production, the first step in a sequence is utilized. The pulsed d.c. voltage having a frequency predetermined by the input alternating current to the transformer 10, is applied to the plate exciter.

The maximum amplitude of the d.c. voltage pulse is sufficient to cause an increase in gas production; however, the minimum amplitude of the pulsed d.c. voltage is insufficient to cause electron leakage. The average of the maximum and the minimum results in an increase gas output but without electron leakage.

The physical force on the movement of the electrons around the negative plate exciter is

further controlled in specific situations by varying the frequency of the pulsed d.c. voltage. The frequency of the pulsed d.c. voltage may be altered by an alternating current of another frequency applied to the input terminals 12 and 14. Alternatively, the frequency of the pulsed d.c. voltage may be varied as shown by the variable transformer 10 winding 11.

With reference to FIG. 3, the unipolar pulsed d.c. voltage of a constant frequency is illustrated. In the first mentioned variation of the amplitude of the pulsed voltage, there is further shown in FIG. 3 voltage levels from OV, Va xxx Vn. As noted below a variation of amplitude above the predetermined levels will permit electron leakage.

Referring to FIG. 8, there is illustrated an appreciation of the significance of electron leakage. Initially it is to be noted that the first amplitude level, L-1, is when electron leakage occurs. Prior to leakage, voltage V.sub.1 increases on demand. At the level L-1, when leakage occurs, current begins to flow and as a consequence the voltage V.sub.2 begins to drop. The current flow increase is proportional to the voltage decrease; and upon arcing, a dead short condition for current takeover, the voltage V.sub.2 drops to zero.

The same rise and fall in amplitude of the voltage versus current flow repeats at amplitude levels L-2, L-3, L-4, and L-5; again, in a given size apparatus, voltages of 4, 5.5, 7, and 8.5.

It is seen then, that it is paramount that electron leakage must be curtailed when the operation of the system is dependant on voltage, such as the generator utilized herein.

Returning to the overall circuit of FIG. 1, the unipolar pulsating d.c. voltage is an improvement in raising the amplitude of the voltage without electron leakage. Unfortunately, it too, has a voltage amplitude limit of 4.0 volts as shown by L-2 of FIG. 8.

To further restrict current flow with amplitude voltages above the level L-2 of FIG. 8, electron leakage is inhibited from the exciter plate having the negative voltage applied thereto, by varying the duty cycle pulse of the pulsed d.c. voltages as shown FIGS. 2, 3, and 8. In an initial application the pulsed d.c. voltage is switched on and off for equal periods of time.

With reference again to FIG. 1, the variable pulsing circuit comprises an electronic switch SCR 28 operable from one state to another from the optocoupler timing circuit 26. The operation and of the pulsing of a voltage is within the state of the art.

Diode 29, a blocking diode, is operable in the accepted manner to eliminate stray electrons, shorts, variances, spurious signals, and the like. In addition the diode 29 blocks the back-electromagnetic force.

The pulsing of the pulsed d.c. voltage, as shown by the waveform of FIG. 2, comprises switching, via trigger circuit 26, the pulsed d.c. voltage on an off--in a first instance. As will be understood below relative to the programming circuit of FIG. 6, the time period of the pulses may be varied periodically or aperiodically, the duration of the on/off period may be varied, the gradient level of the on/off pulses may be varied, and all of the above may be interrelated into a sequence of duty pulses with the varying conditions all as shown in FIGS. 4, 4A, 4B, and 4C.

The duty pulses are effective much in the same manner as the pulsed d.c. voltage pulses in the function of inhibiting electron leakage. The "second" series of force on the electrons around the plate exciter, having the negative potential voltage applied, in terms of voltage amplitude is greater. However, the greater amplitude is averaged by the double pulses to an effective voltage of an amplitude to inhibit electron leakage.

As previously stated, the voltage pulses applied to the plate excitors further enhance the rate of generation of the gasses. Accordingly, to achieve the most effective relationship between gas generation and current limiting, the voltage amplitude is interrelated to the pulse repetition rate of the duty pulses in FIG. 1. Also, the rate of production is related to the frequency of the unipolar d.c. voltage, the frequency then should be interrelated to the duty cycle pulses.

With continued reference to FIG. 1, mechanical switch 40 is a known means for applying the voltages to the plate excitors individually and sequentially. The negative plate exciter is the center conductor of an inner and outer arrangement. The negative plate exciter is connected to ground 20; ground 20 being the power supply ground.

The dual pulses comprised of the frequency repetitive pulses and the duty cycle pulses similarly to the previous configuration. The amplitude is effective to increase the output gas generation with an upper limit of 5.5 volts, in this instance L-3 of FIG. 8.

In a typical configuration of the hydrogen generator of the aforementioned co-pending application, the plate excitors will comprise a plurality of pairs. In the previous configurations the positive voltage was applied in parallel to all the inner plates; whereas the negative voltage was applied to all of the inner plate excitors in parallel. It has been found that an increased surface between the inner and the outer plates will increase the probability of an electron breaking free and leaking to the attractive field of the positive voltage plate. The surface leakage has been eliminated by applying separately and individually the positive voltage to each of the outer plate excitors and the negative voltage to each of the inner plate excitors.

With reference to FIG. 8 again, it is seen that although the serially connected exciter plates do permit a higher amplitude of voltage to be applied, it too, has a limitation L-4 of 7 volts.

The next expediency in the sequence for inhibiting electron leakage is the current inhibitor resister 60 as shown in FIGS. 1 and 5. The circuit 60 comprises a simple resistor of the commercial type or specially made for the particular application. The resistor is variable to provide fine tuning of the electron inhibiting. In that the each pair of plate excitors are connected separately, a resistor 60a xxx 60n is connected to each of the plates having the negative voltage connected thereto. In this embodiment the inner plate of the excitors 50a xxx 50n. In that the inner plate had been normally connected to ground, the resistive element is now connected between the inner plate and ground.

As known in electrical art the resistor will provide a complete block to electron leakage--current flow. However, since the resistor 60 is connected from ground-to-ground there is no real affect on the voltage; and since there is no connection with the positive side there is no voltage drop.

The electron leakage resistor will again raise the upper limit of 8.5 volts amplitude before breakdown as shown at L-5 of FIG. 8. In the generation of the hydrogen and oxygen gasses to an infinite limit, as yet not fully appreciated, the upper level of amplitude of the voltage is removed with the utilization of the electron inhibitor of FIG. 7.

In this embodiment of the current inhibitor connected to the inner plate having the negative voltage applied thereto, comprises a stainless steel sandwich 70/74 with a resistive material therebetween. The stainless steel is a poor conductive material and hence will restrict to some extent the electron flow. Other poor conductive material may be utilized in lieu of the stainless steel. The electron inhibitor 70/74 is connected in the same manner as resistor 60--between the inner plate having the negative potential connected to it and ground.

The resistive value of the electron inhibitor 70/74 is chosen empirically to a closest value, thereafter the total value of the resistance is fine tuned by the resistor 75 connected serially between the inner plate and ground.

To alter the resistive value of the electron inhibitor 70/74, the resistive material 72 comprising a mixture with a binder is altered in the percentage of resistive material to binder.

With reference to FIGS. 1 and 8, the pulse d.c. voltage of a repetitive frequency and the duty cycle pulses, together with the serially connected plate exciter techniques in the sequence for limiting the electron leakage is in relation to the positive exciter outer plate. The current inhibitor resistor 60 and the current inhibitor resistor 70/74 are in the negative voltage line connected to the inner plate.

With particular reference now to FIG. 5, there is illustrated an alternative embodiment for derivint the unipolar d.c. voltage pulse of a repetitive frequency -- similar to that of FIG. 1.

The distinction in the embodiment of FIG. 5 is that the input voltage is a direct current in contrast to the alternating current of FIG. 1.

In operation of the circuit of FIG. 5, a low voltage, such as from a battery, is applied to the primary winding to the circuit of a rotating field. The primary winding 42 being the rotating field has its opposite end connected to ground. As the field of the primary winding 42 rotates, there are induced three pulses at the output of each of the three secondary windings 46a 46b, and 46c.

The repetition of the triple pulse is once per each revolution; hence the number of pulses per given period of time is related to the speed of rotation of the rotating field. A faster rotation will produce a greater voltage frequency. An increase in the number of secondary windings will result in an appropriate increase in the number of pulses; whereas an increase in the number of turns on the secondary windings will increase the amplitude of the pulses. The alternating voltage output of the three secondary windings is converted into pulses by the conventional diode rectifiers 65/67 bridge circuit for each of the separate pairs of exciter plates 50a-50n. In this way a constant unipolar pulsating d.c. voltage of a repetitive frequency similar to that of FIG. 3 is applied to each of the exciter plates 50a xxx 50n. The output is similar to that derived from the alternating voltage input of FIG. 1. The d.c. voltage is a constant voltage pulse.

Again similar to FIG. 1, there is provided a timed pulsing circuit comprised of a timer 17, switch 19, and transistor 18. Initially, the d.c. pulse voltage is switched on and off, to provide a constant share time duty cycle to the primary winding 42 of the rotating field. In the off period there will be no voltage on the primary winding 42, and hence, no voltage output on the secondary winding 46.

The circuit of FIG. 5 is especially economical in that extremely low amplitude voltages (0-5 volts) is applied to the primary 42. At this low level, the current is negligible and power consumption is minimum. The output voltages from the secondary windings 46 is relatively high and is in the order of two hundred volts. The output voltages from the secondary windings 46 are variable in amplitude by the resistor 16 in the input circuit. A very small increment of input voltage results in a much greater output.

The sequence of circuitry of the pulsed d.c. voltage, duty cycle pulses, serially connected excitors, resistor in the ground line, and the plate resistor are each, and together, effective to eliminate electron leakage. The conditions set forth, in each instance were under actual conditions--with distilled water.

In the basic process of water separation as herein utilized, the hydrogen and oxygen gasses are separated by the application of a voltage to the plate excitors with the attendant current as close to zero as possible. Accordingly, the use of natural water having contaminants is

equally operable; the contaminants will have no affect upon the separation of the hydrogen and oxygen atoms from the water molecule; nor will the contaminants have an affect on the plate excitors such as fouling up.

With the use of certain natural waters particularly sea water with a salt content or natural water with an iron or other mineral content, the natural water would have a tendency to draw current. The passing of current as set forth above, would cause the voltage to drop and basically would curtail the operation of the generator.

The resistor 60 of FIGS. 1 and 5, connected between the exciter plate having the negative voltage applied thereto and ground is an effective current limiter/electron inhibiter. In simple terms the restriction to current flow to the negative plate is a restriction to the flow of current between the pair of plate excitors. There can be no electron leakage from the negative potential plate exciter if there are no electrons to leak.

The resistor 60 of FIGS. 1 and 5, and especially when taken together with the resistive plate structure of FIG. 7, current is eliminated from the plate excitors.

In FIG. 1 there is illustrated an alternative manner of varying the rate of separation of the hydrogen and oxygen gasses from water. As fully disclosed and described in the aforesaid copending application Ser. No. 302,807, the spacing between the plate excitors in water is directly related to the rate of separation of the hydrogen and oxygen gasses.

The plate excitors 82 and 83 positioned in water 61 are varied in spacing by the rack 80 and gear 81. The variations can be manually or through the programmer 69 for predetermined gas rate generation. The programmer actuates line 37 to the motor 33 to drive the gear 81.

The closer the spacing the greater the gas yield, i.e., the attractive force of the electrical voltage zones is related to spacing. However as noted above, the closer the spacing the greater the probability of spurious electron leakage. It is appreciated the optimum is the closest spacing for gas generation with a minimum of current leakage.

The pulsed d.c. voltage, the duty cycle pulses, the resistor from negative to ground, the serial connections of the excitors, and the plate resistor in series with a variable resistor between the negative plate and ground, is a sequence of circuits that conteract the electron leakage with increased voltage. Similarly, the same sequence individually and in combination are equally applicable with respect to the variation of plate spacing to vary the rate of generation of the gasses but yet, to restrict electron leakage. The voltage levels from 0 volts upward will be dependant on the physical parameters of the apparatus. In one typical structure of the apparatus the voltage was varied from zero (0) volts to 45 volts. In a smaller structure, the voltage levels of FIG. 8 were utilized.

With reference again to FIGS. 2, 3, 4, 4A, 4B, 4C, and 4D, the waveforms illustrated therein depict the several variations of the pulsed d.c. voltage relative to the duty cycle pulses. Initially, each of the two set of pulses are varied individually. The on/off time of the two sets of pulses in a first instance is uniform. Then the timing of one or the other is varied; the gradient levels of the voltages are varied periodically and a periodically, pulse duration is varied equally and unequally.

To attain the optimum gas generation with minimum electron leakage, is determined empirically with a gas flow meter and an ammeter. The variables are interrelated but not necessarily having the effect on either gas production or electron leakage. Practical training reduces the tune-up period.

In FIG. 6, there is illustrated the resonant cavity of my aforesaid co-pending patent application Ser. No. 422,594. The resonant cavity described and disclosed therein, is a result of the discovery that when the distance between two stationary bodies is equal in wavelength to the frequency of the movement of an object going back and forth therebetween, the movement of the object will go into resonance. The motion is greatly enhanced and with a repetitive sustained force. The principle applied to the hydrogen and oxygen gas generator of the present invention results in the movement of the water molecules and the atoms to an attractive field will be greatly enhanced when the frequency of the back and forth movement is matched to the wavelength of the distance between the pair of plate excitors.

The amplitude is increased to the minimum for resonance. The voltage amplitude thereafter is maintained at the minimum and raised from the minimum for an increase in gas generation. The minimum is the lower gradient level illustrated in the waveforms of the figures. Since resonance is a matter of matching a physical distance with frequency of the back and forth motion over that distance, matching the particular frequency to the particular wavelength, can be with either d.c. voltage pulses or the duty cycle pulses.

The resonant cavity is depicted in FIG. 4 pictorially. It is understood that the exciter plates 50a-50n of FIG. 1 become resonant cavities by matching the distance between the excitors to a pulse frequency of the same wavelength.

In FIG. 4 and 4C, the duty cycle pulses are matched in pulse repetition rate to the plate distance. In FIG. 4A and 4B, the frequency of the pulsed d.c. voltage is matched to the distance in wavelengths of the plate excitors. With the frequency of one of the set of pulses matched to the resonant wavelength, the frequency of the other set of pulses is varied to further control the electron leakage and/or to vary the rate of generation of the gasses.

Referring again to FIG. 6, attention is directed to the resonant cavity depicted therein pictorially. The resonant cavity would be the plate exciter of FIG. 1 or any other plate

exciter wherein the frequency of the pulses of the applied voltage is matched in wavelength to the distance between the exciter plates

The SCR diode is a duty cycle pulse former much in the same manner as the pulse former 27 of FIG. 1. The SCR diode 90 is operational in a conventional manner and the diode 91 is a conventional blocking diode. The operation and function of the resonant cavity is much in the same manner as that of FIG. 1 plate excitors 50a-50n.

In a Hydrogen Resonant Cavity Furnace, the pulse repetition rate is matched to the wavelength distance between the two exciter plates to maximize the rate of generation to voltage amplitude. The flame is pulsed from a first gradient level to a lower gradient level--but not off. The lower gradient level is sufficient to maintain at all times the amplitude to sustain resonance.

The waveform is shown in FIG. 4. The lower level amplitude V_a is not OV the zero level; the amplitude level V_a is sufficient to maintain resonance with a matched repetition rate of the duty cycle pulses.

In FIG. 6, the programmable switch circuit 79 is for variable inputs to a utilitarian device, such as the aforesaid furnace or the automobile hydrogen engine disclosed and claimed in my co-pending patent application Ser. No. 478,207. In the practical working embodiments the demand may be for hot water, heat, singly or together; and in the automobile the rate of acceleration; or simply the control of the flame size.

The increments of heat, acceleration, or flame size are controlled by the triacs 91, 92, 93, and 94, connected across the secondary winding and to taps on the secondary winding of the input transformer.

Synchronized with the voltage level control of the switching of the duty cycle pulse, is variable pulse circuit 97. The switch 95 provides the demand control to be programmed, that is, the voltage amplitude and the duty cycle pulses. The SCR switching circuit 90 converts the d.c. voltage pulse output of the rectifier 15 to duty pulses. The duty cycle pulse being variable in pulse repetition rate to match the distance in wavelength of the spacing of the plate excitors 86 and 87. Diode 98 is a blocking diode.

Although certain and specific embodiments have been shown the invention is not to be limited thereto. Significantly, the relatively small increase in voltage for a very appreciable gas generation upon resonance has extended applications to other uses of the hydrogen and oxygen gas generator. The control of the electron leakage is especially applicable to systems and processes wherein the potential is voltage dependant with no or little current.

USP # 4,613,304

Gas Electrical Hydrogen Generator

Stanley Meyer

(September 23, 1986)

Abstract ~

A hydrogen gas generator system for converting water into hydrogen and oxygen gasses, in combination with a magnetic particle accelerator for voltage/current electrical potential generation. The hydrogen gas generator encompasses an array of plates immersed in a housing and having natural water pass therethrough. Direct current, voltage dependant/current limited, potential applied to the plates causes the hydrogen/oxygen gasses to disassociate from the water molecule. The upper portion of the container is a hydrogen/oxygen mixture collection chamber for maintaining a predetermined gas pressure. There is introduced into the hydrogen/oxygen collection chamber, from a source, a substantial quantity of permanently magnetically polarized particles. Attached to the gas collection chamber outlet is a non-magnetic, non-conductive closed loop of tubing. The polarized magnetic particles are caused to circulate in the closed loop tubing by an electrical and/or mechanical pump. A pick-up coil wound around the tubing will have a voltage induced therein as the magnetic field of the polarized magnetized gas particles pass therethrough. The induced voltage has utilization as an electrical power source. In that the hydrogen/oxygen gasses are not polarized the gasses will seek a pressure release via an outlet. The hydrogen and oxygen gasses may be utilized such as in a burner system.

Inventors: Meyer; Stanley A. (3792 Broadway, Grove City, OH 43123)

Appl. No.: 668577

Filed: November 5, 1984

Current U.S. Class: 431/354; 204/155; 976/DIG427

Intern'l Class: F23D 014/62

Field of Search: 431/258,2,6,12,356,354 204/155,129,72,243 M,DIG. 5,DIG. 6,126,129

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Primary Examiner: Jones; Larry

Parent Case Text

This is a continuation-in-part application of Ser. No. 453,889, filed Oct. 21, 1982 now abandoned.

Claims ~

I claim:

1. In combination, a hydrogen/oxygen generator comprising: a hydrogen/oxygen generator including a housing having a gas collection chamber for maintaining a preset volume of gas therein under pressure, an outlet attached to said collection chamber, a non-magnetic tubing connected to said outlet, a gas line tubing connected to the other end of said non-magnetic tubing and said collection chamber in a closed loop, utilization means, and a Y type of connector alternately connecting said gas line tubing to said gas utilization means and said collection chamber; an inlet means attached to said gas collection chamber, a source of permanently magnetized polarized particles connected to said inlet and wherein said particles upon entering said inlet to said chamber become superimposed on said hydrogen/oxygen gases, means in said non-magnetic tubing for maintaining said polarized particles circulating through said closed loop, a pick-up coil positioned over said non-magnetic tubing and wherein the magnetic field of said magnetized particles passing through said tubing and traversing said pick-up coil induces a voltage/current therein, means for varying the acceleration of said polarized particles in said closed-loop tubing to vary the output magnitude of said induced voltage in said coils, means connected to said coil for utilization of said induced voltage/current potential; and wherein said hydrogen/oxygen gasses are pressure released to said utilization means, and the attractive force of said particles causes a continuous movement through said closed loop non-magnetic tubing.

2. The combination as set forth in claim 1 further comprising: two directional valve means, and a demand circuit connected to said valve means for selectively connecting said gas line tubing to said gas utilization means; and wherein said hydrogen/oxygen gasses have superimposed thereon said polarized particles; in a quiescent circuit demand said polarized

particles continue in motion through said closed loop.

3. The combination as set forth in claim 1 further comprising: a nozzle connected to said gas utilization means of a predetermined size and configuration having a port for expelling said mixed gasses, and means for igniting said gasses.

4. The combination as set forth in claim 1 further comprising: a pressure gauge for determining the pressure in said collection chamber, and switch means connected to said direct current voltage source to terminate the generation of hydrogen/oxygen gasses upon said collection chamber attaining a predetermined pressure.

5. The combination as set forth in claim 1 wherein said polarized particles circulating means comprises an electrical/mechanical means, and wherein said means for varying the acceleration of said polarized particles comprises varying the speed of said electrical/mechanical means.

6. The combination as set forth in claim 1 wherein said polarized particle circulating means comprises mechanical means, and wherein said means for varying the acceleration of said polarized particles comprises varying the speed of the motive force of said mechanical means.

7. The combination of claim 1 wherein said polarized particle circulating means comprises electrical means, and wherein said means for varying the acceleration of said polarized particles comprises varying the electrical input to said electrical means.

8. The combination of claim 7 wherein said electrical means has an alternating voltage input and wherein said means for varying the acceleration of said polarized particles comprises varying the frequency of said alternating input voltage.

9. The combination of a gas electrical generator as set forth in claim 1 wherein: said coil comprises a plurality of windings wound in parallel, and wherein said induced voltage/current therein is of a single polarity.

10. The combination of a gas electrical generator as set forth in claim 1 wherein: said coil comprises a plurality of windings wound in series, and wherein said induced voltage/current therein is of alternate polarity.

11. The combination of a gas electrical generator as set forth in claim 1 wherein: said coil comprises a plurality of windings and wherein the number of windings is determinative of the frequency of said induced voltage/current therein.

12. The combination of a gas electrical generator as set forth in claim 1 wherein said

hydrogen/oxygen generator further comprises an array of plates positioned in said housing and means for passing natural water therebetween, a variable voltage source having circuit means for restricting current, and a positive and a negative terminal, means for connecting said positive terminal and said negative terminal to alternate plates, means for connecting the output of said pick-up coil to said voltage source.

Description ~

CROSS REFERENCE AND BACKGROUND

There is disclosed in my co-pending patent application, filed, Sept. 16, 1981, U.S. Ser. No. 302,807, for Hydrogen Generator, a hydrogen gas generating system. The apparatus comprises a pressure tight enclosure for a water bath having immersed therein an array of plates. The hydrogen and oxygen atoms are disassociated from the water molecule by the application of a non-regulated, non-filtered, d.c. voltage/current limited potential to the plates having natural water pass therebetween. The plates, as well as the housing, are non-oxidizing, non-corrosive, non-reactive, and of similar material. The upper portion of the container is a hydrogen/oxygen storage chamber for maintaining a predetermined level of pressure.

In my co-pending patent application, Ser. No. 411,977, for, Controlled Hydrogen Gas Flame, filed, Aug. 25, 1982, there is disclosed a hydrogen gas burner. The nozzle in the burner is connected to the storage area or gas collection chamber via an appropriate line. The port in the nozzle has an opening of a controlled size and configuration, related to the size of the flame and the temperature and velocity of the burning gas mixture.

Also, in my co-pending patent application, Ser. No. 367,051, for Electrical Particle Generator, filed Apr. 4, 1982, there is disclosed an electrical generating system that is utilized in combination with the aforesaid hydrogen/oxygen generator.

OBJECTS

It is a principal object of the present invention to provide a hydrogen gas electrical generator capable of producing a voltage/current much greater in magnitude heretofore possible.

Another object of the present invention is to provide such a hydrogen gas electrical generator utilizing magnetized elements and wherein the magnetized particles are accelerated in a closed loop tubing to induce a voltage/current in a pick-up winding.

Another object of the present invention is to provide such an electrical generator in combination with a controlled output hydrogen generator.

Another object of the present invention is to provide such an electrical generator that utilizes readily available components that are adaptable to a simplified embodiment.

SUMMARY OF INVENTION

The present invention utilizes the basic principle of inducing a voltage current in a pick-up winding by passing a magnetic element therethrough in combination with a hydrogen gas generator. The particle accelerator utilizes the principles of my co-pending application Ser. No. 367,051, and the hydrogen generator is particularly that of my co-pending patent application, Ser. No. 302,807.

The hydrogen gas generator encompasses an array of plates immersed in housing having natural water pass therethrough. Direct current, voltage dependant/current limited, potential applied to the plates causes the hydrogen/oxygen gasses to disassociate from the water molecule. The upper portion of the container is a hydrogen/oxygen collection chamber for maintaining a predetermined gas pressure including an outlet means.

There is introduced into the hydrogen/oxygen collection chamber from a source a substantial quantity of permanently magnetically polarized particles. The particles dispersed in the collection chamber will superimpose themselves on the generated hydrogen/oxygen gasses. Attached to the gas collection chamber outlet is a non-magnetic/non-conductive closed loop of tubing. The polarized magnetic particles are caused to circulate in the closed loop tubing by an electrical and/or mechanical pump. Due to the alignment and the attraction of the particles, the particles movement through the loop is continuous. A pick-up coil wound around the tubing will have a voltage induced therein as the polarized magnetized gas particles pass therethrough. The induced voltage has utilization as an electrical power source. In that the hydrogen/oxygen gasses are not polarized the gasses will seek a pressure release via an outlet. The hydrogen and oxygen as may be utilized such as in a burner system.

Other objects and features of the present invention will become apparent from the following detailed description when taken in conjunction with the drawings in which:

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a simplified illustration of the principles of the invention, in cross-section showing the electrical particle voltage/current generator together with the hydrogen generator in a preferred embodiment.

FIG. 1

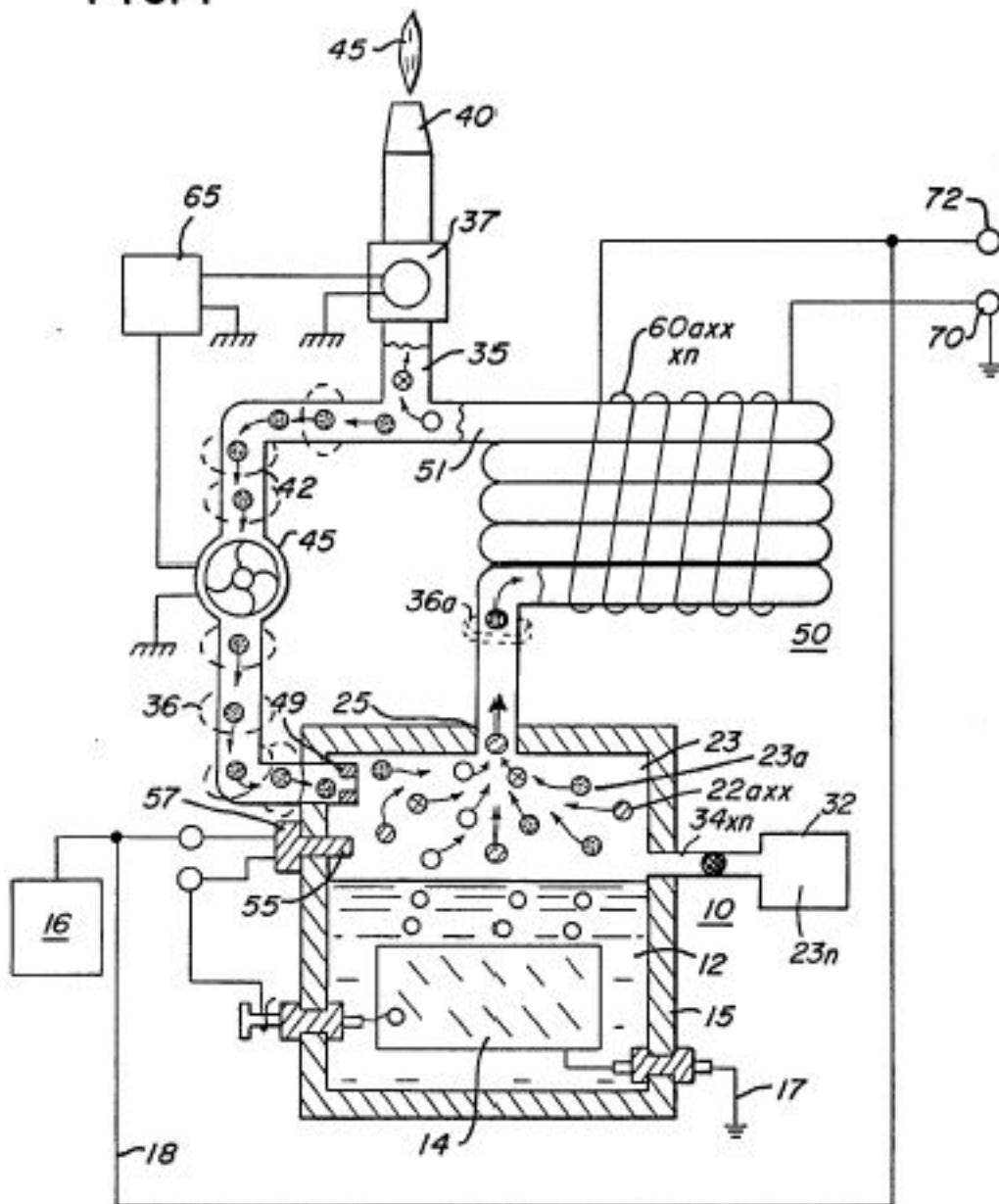
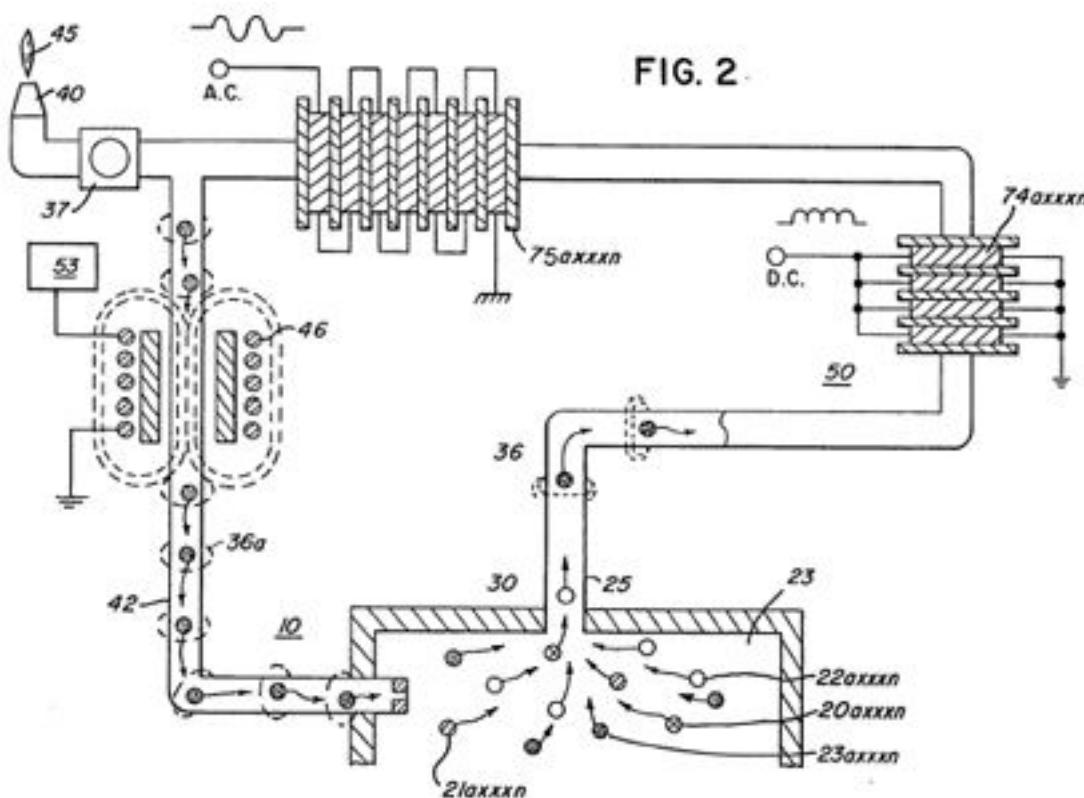


FIG. 2 is a magnetic particle tubing, in an electrical schematic circuit arrangement, illustrating the induced direct and alternating current voltage.



DETAILED DESCRIPTION OF DRAWINGS

Referring now to FIG. 1 there is illustrated the invention of the preferred embodiment in a simplified schematic arrangement. The generator 10 comprises an airtight pressure housing 15 of non-corrosive, non-oxydizing, non-reactive material. The housing 15 is filled with natural water of a predetermined level. Immersed in the water 12 is an array of plates 14.

In the preferred embodiment of the invention of FIG. 1, as disclosed in my co-pending application Ser. No. 302,807, the plates 14 are in pairs of similar non-corrosive, non-oxydizing, non-reactive material. A variable voltage source 16 having circuitry to restrict the amperage comprises additionally a pair of terminals connecting a positive and negative voltage to alternate plates 14 in the pair. The applied potential to the plates causes the hydrogen and oxygen atoms to disassociate themselves from the water molecule.

The released hydrogen gas depicted as particles 20a xxx 20n and oxygen gas particles 22a xxx 22n are collected and stored in the chamber 23 together with other released gasses such as nitrogen 21a xxx 21n.

The loop arrangement of tubing 50 has wound thereon a substantial number of turns 60a xxx 60n in a winding 60. The number and size of the turns is related to the tubing configuration and voltage/current output as setforth in my co-pending application. The magnetically charged particles traveling with a high accelerated velocity pass through the tubing 50. As the magnetically charged particles pass through the core of the winding 60,

their magnetic field 36a traverses the windings 60a xxx 60n, and induces a voltage/current therein. The output voltage/current is utilized via terminals 70-72.

As aforesaid, the storage chamber 23 is maintained at a predetermined pressure; and once the pressure is attained the hydrogen/oxygen gasses will be expelled into outlet line 25 with a substantial velocity. The pressure released gas mixture continues through the entire loop arrangement of tubing 50.

Upon demand for the flame, (such as for heat) from demand circuit 65, the valve 37 is opened causing the gas mixture circulating in closed loop 50 to be released to the nozzle 40 and provide the flame 45 upon ignition.

The hydrogen/oxygen gasses having the particles superimposed therein will separate and be pressure released via tubing 35 to the nozzle 40. In that the magnetic fields of the polarized particles provide an attractive force, the motion of the polarized particles through the closed loop 50 will be greater than the gas mixture pressure release. That is, with the valve 37 open the hydrogen/oxygen gasses will separate themselves from the polarized particles. The hydrogen/oxygen gasses will go via 35 to nozzle 40 whereas the polarized particles will continue to circulate through the closed loop. The chamber 23 further includes switch means 57 to shut off the electrical source 16 to the generator system when the pressure in the chamber 23 sensed by pressure gauge 55, achieves a predetermined level.

In the operation of the hydrogen generator as a burner, as disclosed in the co-pending patent application Ser. No. 411,797, the outlet tube 25 is connected directly to the nozzle 40 to obtain the flame 45 upon ignition. The operation of the gas burner is not altered in the present invention.

The housing 15 further comprises an inlet 34 having source 36 connected thereto. This permits the entry into the chamber 23 of a substantial amount of permanently polarized magnetized particles 36a xxx 36n.

The polarized particles 36a xxx 36n upon entry into the chamber 23 superimpose themselves on the hydrogen/oxygen gasses.

Upon demand, as set forth below, the opening of the valve 37 causes a pressure differential with the gasses collected in the chamber 23. In this way the gasses having the polarized particles superimposed thereon will be pressure released and caused to enter the closed loop 50.

Once in the closed loop the accelerator 45 will maintain the gasses and the superimposed polarized particles in a continuous circulating motion through the closed loop 50.

Connected to the outlet tubing 25 is a series of loops of non-magnetic tubing 50. The tubing in its loop configuration can be any one of the arrangements illustrated in my co-pending patent application, *supra*. The opposite end 51 of the loop 60 tubing is connected, via a Y connection, either to the burner assembly 40, via line 35, or a return line 42 to the storage 30, chamber 23.

It is to be appreciated that a minuscule amount of polarized particles will be carried into the outlet 35 as well as hydrogen/oxygen gas continuing to circulate through the closed loop. In the event the amount of polarized particles expended should become significant, the quantity of particles will be replenished from source 32.

Upon satisfaction of the demand, the valve 37 will close and thereby cause the gas mixture circulating through closed loop 50 to return to the collection chamber 23 via close loop line 42. In this arrangement the pump 45 will continue to be operative and cause a continuous circulation of the polarized particles through the closed loop. If the gas in the collection chamber is of the preset pressure, as sensed at gauge 55, the voltage via terminal 16 will be cutoff discontinuing the generation of gas.

With hydrogen/oxygen gas mixture demand circuit quiescent, the polarized particles will not be separated from the hydrogen/oxygen gasses at the outlet 35. The pump 45 is a continuous pump and thereby continuous to circulate through the closed loop 50 the polarized particles superimposed on the gas mixture from chamber 23.

The magnetized particle source 32 is operative to transform a material into minute vapor particles that are capable of being permanently polarized magnetically. The vapor, in the nature of a gas will superimpose on the hydrogen/oxygen gas.

With particular reference to FIG. 2 there is illustrated, partly in schematic and partly pictorial the preferred embodiment of the invention.

Initially is is noted that the pump 45 of FIG. 1 has been replaced by the electrical particle accelerator 46. The accelerator 46 is a non-mechanical/no moving part element and therefore not subject to wear. It is to be recalled, polarized particles have placed there on a magnetic field potential. Hence, as the magnetized particles approach the accelerator 46 they are attracted and as they pass the center of the accelerator and they are propelled therethrough.

Other propulsion means in lieu of the pump 45 of FIG. 1 or the accelerator 46 of FIG. 2 may be utilized.

As noted in the aforesaid co-pending patent application, the induced current/voltage can

be, at the output 70-72, either direct current, or alternating current, or both. With reference to FIG. 2, the simplified schematic illustrates a direct current voltage 4 parallel winding and an alternating current 75 in serial winding.

The number of coils 74a xxx n of direct current windings of coil 74 will determine the ripple frequency of the direct current voltage and its amplitude. Similarly, the number of alternating current windings 75a xxx n will determine the alternating frequency of the alternating current voltage and its amplitude.

More importantly, the aforesaid ripple frequency of the single polarity voltage of coil 74 and alternating frequency of the alternating voltage of coil 75 can be altered, varied, and controlled. That is, the frequency is a function of the number of discrete windings of the coils times the velocity of the gas per second. The velocity of the polarized particles in tubing 50, in turn, is varied by varying the magnitude of the input voltage to the accelerator 46. Simply an arithmetical increase in acceleration of the polarized particles results in a geometrical increase in frequency and amplitude of the output voltage from either the direct current winding 74 or the alternating current winding 75.

In the co-pending application, supra, for the Electrical Particle Generator, the accelerator input voltage source 53 is intended to comprise circuitry to provide alternate forms of electrical power, such as direct current, alternating current, direct current pulsing, and variable voltage. The output taken at the pick-up windings is related to the input voltage in shape, magnitude and in waveform.

With reference to FIG. 1 and with continued reference to FIG. 2, the hydrogen/oxygen generator 10, has applied to the plates 14 a direct current voltage. The voltage applied to the plates 14 from power supply 16, depending upon the utility of the generator, may be a variable voltage. For instance, if it is desired to vary the intensity of the flame 45, the voltage at the plates 14 will be varied.

Further, as specifically repeated, the voltage is current limited. Accordingly, the power source 16 will provide circuitry for varying the voltage to the plates 14 and for restricting the amperage to a negligible value relative to said voltage.

In a self-sustaining embodiment of the gas electrical generator, a portion of the output at the voltage taps 70-72 of the pick-up coils is directed back to the power supply 16. In that the total power requested to be applied to the plates 14 is relatively low, an insignificant portion of the output at taps 70-72 is required for sustained operation of the generator.

The electrical particle portion of the electrical gas generator of the present invention is operative continuously as set forth above. Hence the output voltage at taps 70-72 will be available to the power supply 16 whenever a demand for gas generation is made.

US Patent # 4,465,455

Start-up/Shut-down for a Hydrogen Gas Burner

Stanley Meyer

(August 14, 1984)

Abstract ~

System for flame start-up/shut-down for a hydrogen gas mixture burner. An electrical probe igniter positioned adjacent the gas port outlet. On demand the igniter is actuated to heat and electrically heat a thermal switch. Responsive electronic controls actuate the appropriate valves and circuits for operational start-up. Upon the ignition of the generated hydrogen gas mixture, a second thermal probe is heated by the flame to deactivate the ignition and start-up circuits. After demand the second thermal probe cools and the circuit is restored for start-up again. A safety probe positioned in the flame is quiescent. In the event of demand time shut-down, the safety probe will activate the circuits for restart. If failure to start-up continues for a predetermined time, the safety probe circuit will effect permanent shut-down.

Inventors: Stanley A. Meyer (3792 Broadway Blvd., Grove City, OH 43123)

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Filed: September 24, 1982

Current U.S. Class: 431/27; 431/66; 431/70; 431/78

Intern'l Class: F23N 005/00

Field of Search: 431/27,46,66,67,69-71,72,74,78-80 123/3,1 A,DIG. 12 204/129

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Primary Examiner: Barrett; Lee E.

Attorney, Agent or Firm: Cennamo; Anthony D.

Description

CROSS REFERENCES

In the non-electrolysis process disclosed and claimed in my co-pending patent application, Ser. No. 302,807, Filed: Sept. 16, 1981, For:HYDROGEN GENERATOR SYSTEM, for separating hydrogen and oxygen atoms from water, water is passed between two plates of similar non-oxidizing metal. The one plate has placed thereon a positive potential and the other a negative potential from a very low-direct-current power source. The sub-atomic action of the direct current voltage causes the hydrogen and oxygen atoms to be separated. The contaminants in the water are forced also to disassociate itself and may be collected or utilized and disposed of. This in turn lends the process to recombining the hydrogen and oxygen into pure water.

The direct current voltage applied to the plates is non-regulated and non-filtered. The direct current acts as a static force on the water molecules; whereas the rippling direct current voltage acts as a dynamic force. Pulsating the direct current further acts as a dynamic force and enhances considerably the splitting of the atoms from the water molecules. An increase in voltage potential further increases the hydrogen output. Certain plate arrangements and configurations with graphical illustration or relative efficiency are disclosed.

In my co-pending patent application, Ser. No. 422,495, Filed: Sept. 24, 1982, For: PERIODIC FLUSH SYSTEM FOR NON-ELECTROLYSIS HYDROGEN GENERATOR, there is disclosed control apparatus and electrical circuitry for periodically shutting down the hydrogen generator for flushing out the accumulated contaminates. The shut-down is in a sequential step-by-step operation. After the flushing is complete, the hydrogen generator is started up and, again, in a sequential step-by-step operation. Although the functions are numerous, the most critical is the opening and closing of the gas valves, and the switching on and off of the electrical circuitry to the exciter elements.

BACKGROUND

Heating and air environmental systems of the prior art have included sensing systems for flame-out, power loss or the like. These systems do provide some form of shut-down upon occurrence of a malfunction.

However, the prior art systems are either of gas, oil, or electrical. Although a gas or oil furnace will utilize electrical circuitry for a blower, the energy, whether gas, oil, or electric, is supplied either by a utility or in bulk. None of the prior art systems generate the energy that is used in the heating or air control system. Accordingly, no monitoring

systems for the generator systems are known in the prior art, that are applicable heating or air control systems.

SUMMARY OF INVENTION

The present invention in its preferred embodiment provides a monitoring system and a start-up/shut-down circuitry and apparatus for a hydrogen gas burner. The system is distinctive in that the hydrogen generator is a demand system; that is, hydrogen gas is generated only when the thermostat (or other gauge) dictates the energy is needed. Accordingly, the start-up is the start-up of the energy generating system and thereafter starting the igniter to ignite the hydrogen gas mixture. Further, although the prior systems start-up on demand; none have a need for periodic shut-down.

The present invention is a start-up/shut-down system for an energy generator and for the utilization of the energy generated. The function in addition to demand is periodic. Then, again, the same procedure is followed upon the occurrence of malfunction.

The apparatus comprises an igniter in the flame path that upon actuation heats a thermal probe that controls the electrical/electronic circuitry for opening and closing the various controls and switches. Another probe deactivates the ignition and start-up upon completing the function. A safety probe positioned in the flame path is time controlled to start-up in the occurrence of a flame-out, if failure occurs in the attempt to retract within a given period of time the entire system is shut-down.

OBJECTS

It is a principal object of the present invention to provide a monitoring and control system for start-up and shut-down of an energy generator system.

Another object of the present invention is to provide such a control system that is operable upon demand, periodically operable, and operable upon occurrence of a malfunction.

A further object of the invention is for a monitoring and control system that distinguishes between an accidental flame-out and a flame-out caused by malfunction of the system.

A further object of the invention is for a monitoring and control system that provides a restart function upon accidental flame-out.

Other objects and features of the present invention will become apparent from the following detailed description when taken in conjunction with the drawings in which:

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 schematically depicts a preferred embodiment of the invention of a hydrogen gas mixture burner incorporating the features of the invention.

FIG. 1

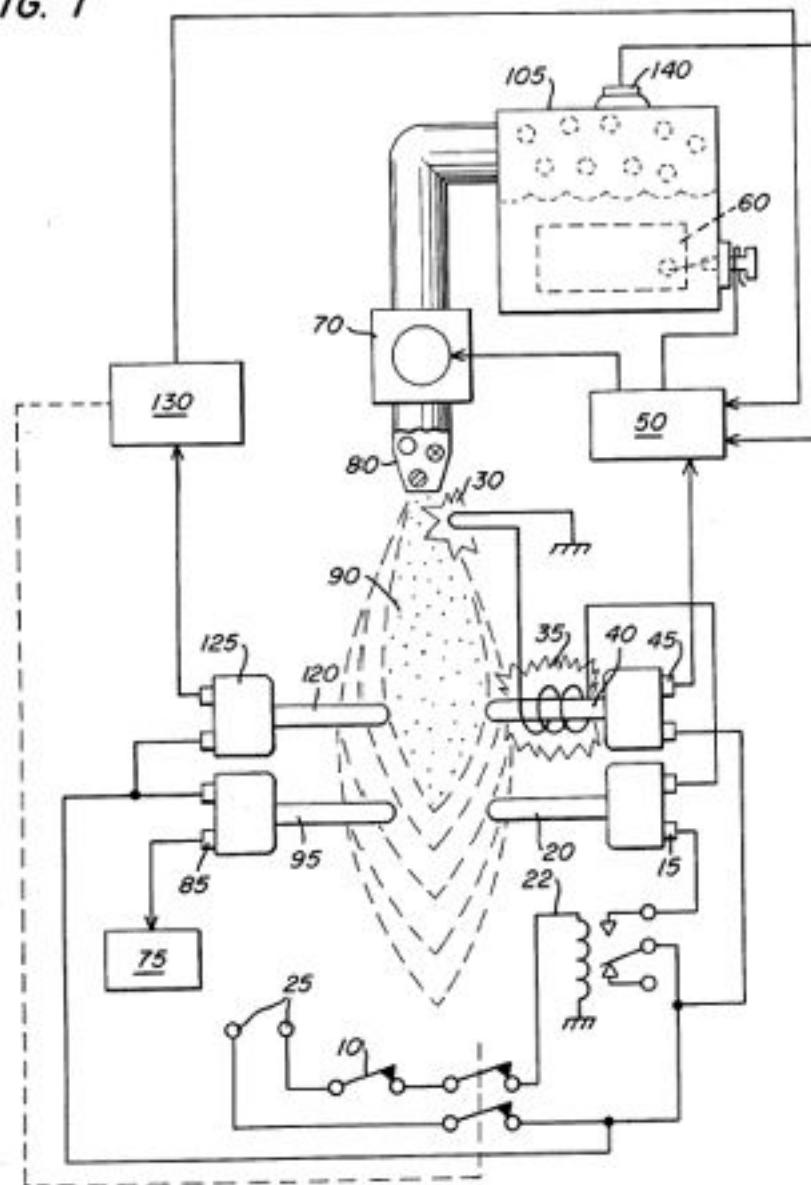


FIG. 2 is a schematic block diagram of the preferred embodiment in a complete operational generator system.

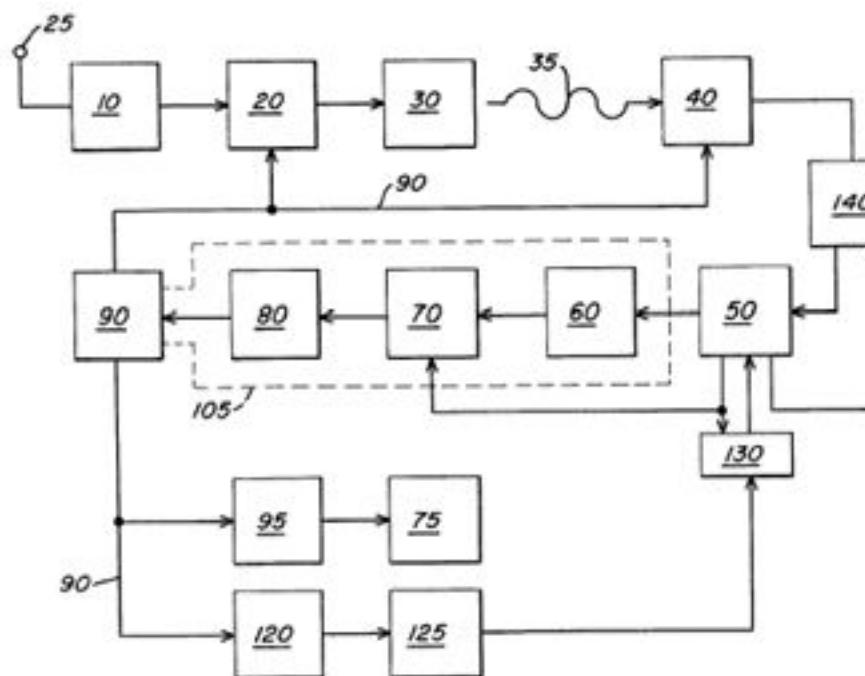


FIG. 2

DETAILED DESCRIPTION OF DRAWINGS

With reference to FIG. 1 there is illustrated schematically the mechanical/electrical apparatus of the system of the preferred embodiment of the invention taken in conjunction with the hydrogen generator of my co-pending patent application, supra. In FIG. 2 the electrical circuitry and actuating valves and the like are depicted in a sequential schematic block type of arrangement.

Referring to FIG. 1, together with FIG. 2, the preferred embodiment of the present invention may now be described. The thermal probe switch 20, before start-up, is in a normally closed position. Upon the demand for energy, dictated by the thermostat 10 control, the relay 22 is closed, applying electrical power from source 25 to the electrical spark igniter 30 through the closed thermal probe 20. Upon the spark igniter 30 attaining the appropriate temperature, the radiant heat from coil 35 heats the thermal probe 40.

As the thermal probe 40 heats, the normally open switch 45 closes and in turn actuates the electrical control circuit 50. The control circuit 50 closes the circuit to apply electrical power to the excitors 60 in the non-electrolysis hydrogen generator 105.

In sequence, and upon attaining appropriate pressure from the gasses generated as indicated by pressure valve in the hydrogen generator 105, also illustrated in FIG. 2 in dotted line block, the gas outlet valve 70 is opened, permitting gas to be expelled through a nozzle assembly 80.

Upon the gas making contact with the heated electrical spark igniter 30, the hydrogen gas

mixture, expelled from the controlled port opening in nozzle assembly 80 is ignited into a continuous extremely high temperature flame 90.

The thermal probe 95 immediately begins to heat and after attaining the predetermined temperature the fan assembly 75 is actuated by the closure of relay 85.

The flame 90 having been ignited and burning, causes the thermal probe 20 to become heated and thereby opening its relay 15. In turn, the voltage applied to the electrical spark igniter 30 is terminated by the open relay 15.

Upon the demand from the thermostat 10 being reached the relay 22 is opened thereby cutting off the voltage 25 to the thermal probe switch 20. Sequentially the electrical control circuit 50 opens the circuit providing voltage to the excitors 60; thereby shutting gas outlet valve 70 to terminate the flame 90. Thereafter the circuit is ready for start-up again upon demand from the thermostat 10, as aforesaid.

A safety probe 120 is also positioned in the flame 90. During operation of the system under demand from the thermostat control 10, the probe 120 will remain heated. In this condition the attendant relay 130 is inoperative. If for some reason the flame 90 should be extinguished during the demand period the safety probe 120 will quickly cool and in sequence the attendant relay 130 will open. Relay 130 connected to relay 22 in the power circuit will act in place of the demand thermostat 10, that is, the relay 130 will override the demand thermostat 10. The circuits and functions will follow as above-described for start-up in the event the flame-out was accidental.

The safety control system further includes a timer circuit and thermostat 125 that will permit the probe 120 to attain its temperature within a given period of time. If the probe 120 does not attain its temperature the same start-up procedure will follow again, within a given period of time. The timer 125 is so set that unless the probe 120 attains the appropriate temperature within the given period of time the entire circuitry is shut down permanently. This denotes a major failure in the system and not a simple flame-out.

Finally, in the unlikely event of pressure build-up upon malfunction, there is provided a safety relief valve 140.

USP 4,421,474

Hydrogen Gas Burner

Stan Meyer

Abstract ~

A hydrogen gas burner for the mixture of hydrogen gas with ambient air and non-combustible gasses. The mixture of gasses when ignited provides a flame of extremely high, but controlled intensity and temperature. The structure comprises a housing and a hydrogen gas inlet directed to a combustion chamber positioned within the housing. Ambient air intake ports are provided for adding ambient air to the combustion chamber for ignition of the hydrogen gas by an ignitor therein. At the other end of the housing there is positioned adjacent to the outlet of the burner (flame) a barrier/heating element. The heating element uniformly disperses the flame and in turn absorbs the heat. The opposite side to the flame, the heating element uniformly disperses the extremely hot air. A non-combustible gas trap adjacent to the heating element captures a small portion of the non-combustible gas (burned air). A return line from the trap returns the captured non-combustible gas in a controlled ratio to the burning chamber for mixture with the hydrogen gas and the ambient air.

Description ~

CROSS REFERENCE

The hydrogen/oxygen generator utilized in the present invention is that disclosed and claimed in my co-pending patent application, Ser. No.: 302,807, filed: Sept. 16, 1981, for: **HYDROGEN GENERATOR SYSTEM**. In that process for separating hydrogen and oxygen atoms from water having impurities, the water is passed between two plates of similar non-oxidizing metal. No electrolyte is added to the water. The one plate has placed thereon a positive potential and the other a negative potential from a very low amperage direct-current power source. The sub-atomic action of the direct current voltage on the non-electrolytic water causes the hydrogen and oxygen atoms to be separated--and similarly other gasses entrapped in the water such as nitrogen. The contaminants in the water that are not released are forced to disassociate themselves and may be collected or utilized and disposed of in a known manner.

The direct current acts as a static force on the water molecules; whereas the non-regulated rippling direct current acts as a dynamic force. Pulsating the direct current further enhances the release of the hydrogen and oxygen atoms from the water molecules.

In my co-pending patent application, Ser. No.: 262,744, filed: May 11, 1981, for: **HYDROGEN AIRATION PROCESSOR**, there is disclosed and claimed the utilization of

the hydrogen/oxygen gas generator. In that system, the burn rate of the hydrogen gas is controlled by the controlled addition of non-combustible gasses to the mixture of hydrogen and oxygen gasses.

PRIOR ART

The electrolysis process for generating hydrogen and oxygen gas is well known in the art. It is, of course, further understood with a proper mixture of oxygen gas, the hydrogen gas is combustible and under ideal conditions a flame, may be had. Reference is made to U.S. Pat. No. 4,184,931. However, in that the burning velocity of hydrogen is 265-325 cm./sec. versus 37-45 cm./sec. of that of gasoline, the velocity of hydrogen is so great that the hydrogen ensuing from a nozzle will not under ordinary circumstances sustain a flame.

Therefore, to sustain a flame at a nozzle attached to a hydrogen generator the burning velocity of the hydrogen gas must be reduced.

It has been found that all water in its natural state whether it be tap water, well water, sea water, or fresh water is a saturate of ambient air. Further, in that ambient air contains a substantial amount of nitrogen, all natural water will have entrapped therein nitrogen. Again, the percentage of nitrogen entrapped in natural water has been determined to be a fixed percentage and very uniform at seventeen (17%) percent -- irrespective of the source of the water or its impurities. Hence, a natural water gas analysis will show a seventeen percent of nitrogen relative to the hydrogen and the oxygen.

The nozzle connected to the collection chamber via an appropriate line, has a port opening of a controlled size and configuration, related to the size of the flame and the temperature and velocity of the burning gas mixture. To maintain the flame, that is to prevent blowout, additional nozzles are included when the overall flame size is to be increased.

SUMMARY OF INVENTION

The present invention is for a hydrogen gas burner and comprises a combustion chamber for the mixture of hydrogen gas, ambient air, and non-combustible gasses. The mixture of gasses is ignited and burns at a retarded velocity rate and temperature from that of hydrogen gas, but at a higher temperature rate than other gasses.

The extremely narrow hydrogen gas mixture flame of very high temperature is restricted from the utilization means by a heat absorbing barrier. The flame strikes the barrier which in turn disperses the flame and absorbs the heat therefrom and thereafter radiates the heat as extremely hot air into the utilization means.

Positioned on the opposite side of the heat radiator/barrier is a hot air trap. A small portion

of the radiated heat is captured and returned to the combustion chamber as non-combustible gasses. Valve means in the return line regulates the return of the non-combustible gas in a controlled amount to control the mixture.

The present invention is principally intended for use with the hydrogen generator of my co-pending patent application, *supra*; but it is not to be so limited and may be utilized with any other source of hydrogen gas.

OBJECTS

It is accordingly a principal object of the present application to provide a hydrogen gas burner that has a temperature controlled flame and a heat radiator/barrier.

Another object of the present invention is to provide a hydrogen gas burner that is capable of utilizing the heat from a confined high temperature flame.

Another object of the present invention is to provide a hydrogen gas burner that is retarded from that of hydrogen gas, but above that of other gasses.

Another object of the present invention is to provide a hydrogen gas burner that utilizes the exhaust air as non-combustible gas for mixture with the hydrogen gas.

Another object of the present invention is to provide a hydrogen gas burner that is simple but rugged and most importantly safe for all intended purposes.

Other objects and features of the present invention will become apparent from the following detailed description when taken in conjunction with the drawings in which:

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is an overall cross-sectional view of the present invention in its most preferred embodiment.

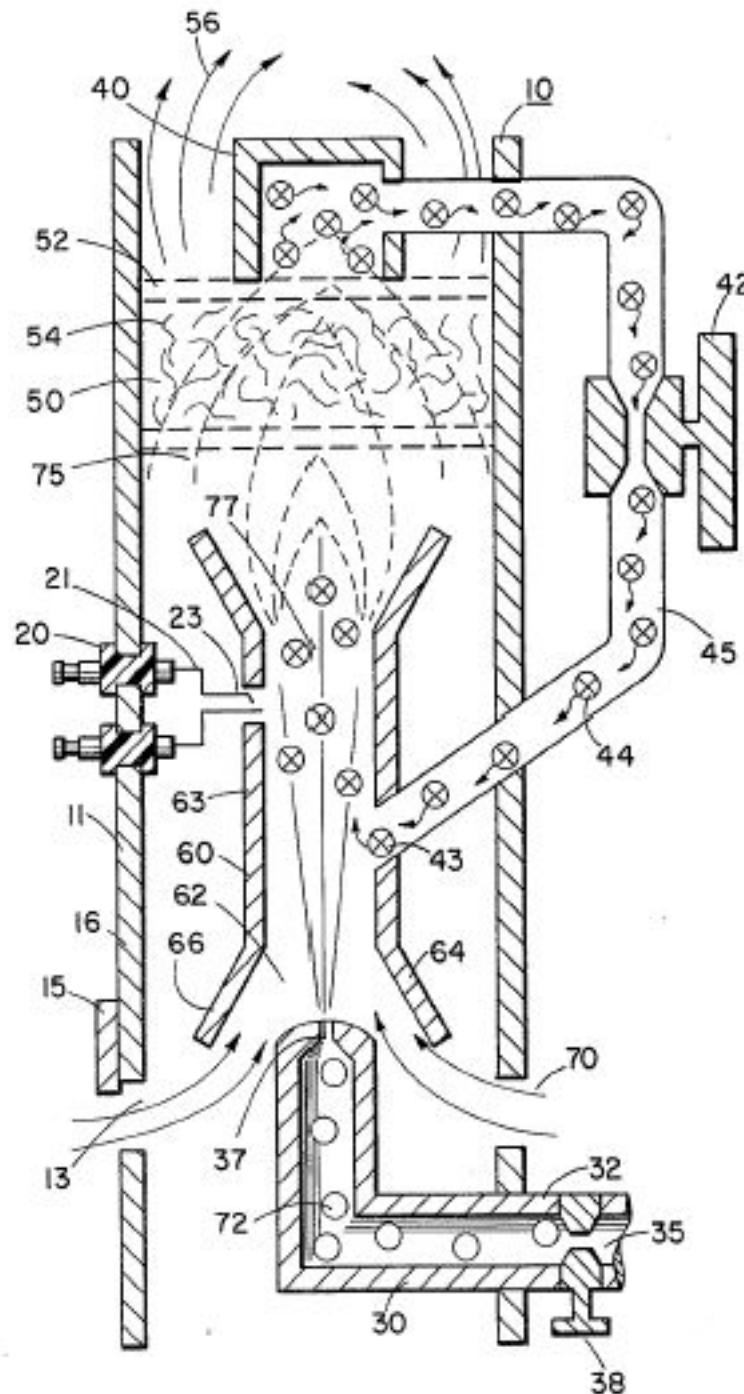


FIG. 2 is a graphical illustration of the burning of various standard fuels with that of hydrogen velocities.

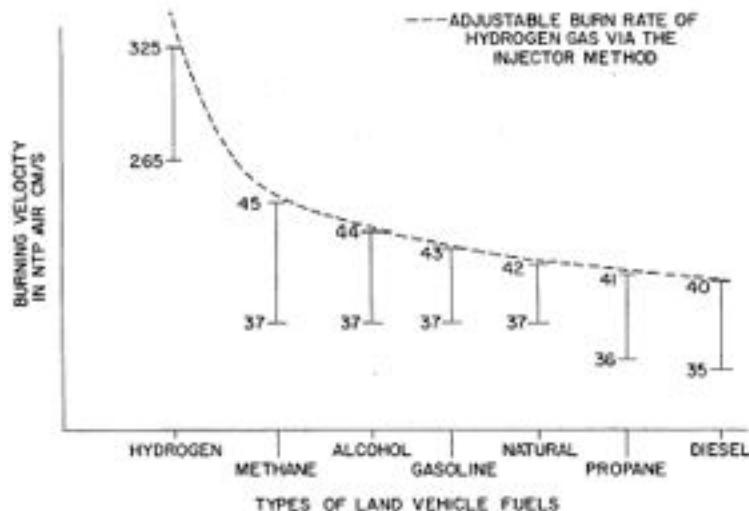


FIG. 2

DETAILED DESCRIPTION OF INVENTION

With particular reference FIG. 1 there is illustrated in a schematic crosssection the principals of the present invention.

The structure of the preferred embodiment comprises a housing 10, having an igniter 20 extending through the wall 11 thereof. A combustion chamber 60 positioned within the housing 10 has a first open end 62. A hydrogen gas 72 inlet 30 directs hydrogen gas via port 37 from a source 35 to the inlet 62 of the combustion chamber 68. Also directed to the same inlet 62, and assisted by flanges 64 and 66, is ambient air 70 entering through ports 13 in the housing 10.

Adjacent the opposite end of the combustion chamber 60 the gas mixture 75 is ignited by the ignitor 20 to produce flame 77.

The velocity of the flame 77 causes it to strike and penetrate the barrier/radiator 50. The barrier 50 is of a material, such as metallic mesh or ceramic material, to disperse therein the flame and in turn become saturated with heat. The flame 77 is of a size sufficient to be dispersed throughout the barrier 50, but yet, not penetrate through the barrier 50.

Radiated from the surface 52 of the barrier 50 is superheated air 56 (gasses) to be passed on to a utilization device.

Adjacent to surface 52 of barrier/radiator 50 is a hot air trap 40 with closed loop line 45 returning non-combustible gas 44 to the combustion chamber 60. Control valve 42 is intermediate the line 45.

In operation of the preferred embodiment hydrogen gas, 72, emitted from the nozzle 37 is directed to the combustion chamber 60. The flanges 64 and 66 on the open end of housing

63 of the combustion chamber 60 enlarges the open end of 62. In the enlargement ambient air from the opening 13 in the housing 10 is also directed to the combustion chamber 60.

The ambient air and hydrogen traverses the opening 43 and further mixes with the non-combustible gas 44 from the closed loop line 45 with the hot air trap 40.

The mixture of hydrogen gas 72, ambient air 70, and non-combustible gas 44, is ignited by the ignitor 20 having electrical electrodes 21 and 23. Upon ignition flame 77 ensues.

The mixture is controlled with each of three gasses. That is, the line 32 from the hydrogen source 35 has a valve 38 therein for controlling the amount of hydrogen 72 emitted from the nozzle 37. The opening 13 has a plate adjustment 15 for controlling the amount of ambient air 60 directed to the combustion chamber 60, and the closed-loop line has valve 42, as aforesaid, for controlling the amount of non-combustible gasses in the mixture.

It can be appreciated that the temperature of the flame 77 and the velocity of the flame 77 is a function of the percentage of the various gasses in the mixture. In a practical embodiment, the flame 70 temperature and velocity was substantially retarded from that of a hydrogen flame per se; but yet, much greater than the temperature and velocity of the flame from the gasses utilized in a conventional heating system.

To maintain a sufficient pressure for combustion of the hydrogen gas mixture with a minimum of pressure (for safety) and to limit blowout, the nozzle 37 opening 39 is extremely small. As a consequence, if the hydrogen gas were burned directly from the nozzle 37, the flame would be finite in diameter. Further, its velocity would be so great it is questionable whether a flame could be sustained.

The mixing of ambient air and non-combustible gas does enlargen the flame size and does reduce its velocity. However, to maintain a flame higher in temperature and velocity than the conventional gasses, the size and temperature of the flame is controlled by the aforementioned mixture.

Therefore, to utilize the flame 77 in a present day utilization means, the flame is barred by the barrier 50. The barrier 50 is of a material that can absorb safely the intense flame 77 and thereafter radiate heat from its entire surface 52. The material 54 can be a ceramic, metallic mesh or other heat absorbing material known in the art. The radiated heat 56 is directed to the utilization means.

As aforesaid, the mixture of gasses that are burned include non-combustible gasses. As indicated in the above-noted co-pending patent applications, an excellent source of non-combustible gasses are exhaust gasses. In this embodiment, the trap 50 entraps the hot air 74 and returns the same, through valve 42, to the combustion chamber 60 as non-

combustible gas.

With reference to FIG. 2 there is illustrated the burning velocity of various standard fuels. It can be seen the common type of fuel burns at a velocity substantially less than hydrogen gas.

The ratio of hydrogen with non-combustible oxygen gasses is varied to obtain optimum burning velocity and temperature for the particular utilization. Once this is attained, the ratio, under normal conditions, will not be altered. Other uses having different fuel burn temperature and velocity will be adjusted in ratio of hydrogen/oxygen to non-combustible gasses in the same manner as exemplified above.

Further, perhaps due to the hydrogen gas velocity, there will occur unburnt gas at the flame 77 output. The barrier 50, because of its material makeup will retard the movement and entrap the unspent hydrogen gas. As the superheated air 77 is dispersed within the material 54, the unspent hydrogen gas is ignited and burns therein. In this way the barrier 50 performs somewhat in the nature of an after burner.

USP # 4,389,981

Hydrogen Gas Injector System for Internal Combustion Engine

Stan Meyer

Abstract ~

System and apparatus for the controlled intermixing of a volatile hydrogen gas with oxygen and other non-combustible gasses in a combustion system. In a preferred arrangement the source of volatile gas is a hydrogen source, and the non-combustible gasses are the exhaust gasses of the combustion system in a closed loop arrangement. Specific structure for the controlled mixing of the gasses, the fuel flow control, and safety are disclosed.

Description ~

CROSS REFERENCES AND BACKGROUND

There is disclosed in my co-pending U.S. patent application Ser. No. 802,807 filed Sept. 16, 1981 for a Hydrogen-Generator, a generating system converting water into hydrogen

and oxygen gasses. In that system and method the hydrogen atoms are disassociated from a water molecule by the application of a non-regulated, non-filtered, low-power, direct current voltage electrical potential applied to two non-oxidizing similar metal plates having water passing there-between. The sub-atomic action is enhanced by pulsing the non-regulated and non-filtered direct current voltage. The apparatus comprises structural configurations in alternative embodiments for segregating the generated hydrogen gas from the oxygen gas.

In my co-pending patent application filed May 5, 1981, U.S. Ser. No. 262,744 now abandoned for Hydrogen-Airdation Processor, non-volatile and non-combustible gasses are controlled in a mixing stage with a volatile gas. The hydrogen airdation processor system utilizes a rotational mechanical gas displacement system to transfer, meter, mix, and pressurize the various gasses. In the gas transformation process, ambient air is passed through an open flame gas-burner system to eliminate gasses and other present substances. Thereafter the non-combustible gas-mixture is cooled, filtered for impurity removal, and mechanically mixed with a pre-determined amount of hydrogen gas. There results a new synthetic gas. The synthetic gas formation stage also volume meters and determines the proper gas-mixing ratio for establishing the desired burn-rate of hydrogen gas. The rotational mechanical gas displacement system in that process determines the volume-amount of synthetic gas to be produced.

The above-noted hydrogen airdation processor, of my co-pending application, is a multi-stage system having utility in special applications. Whereas the hydrogen generator system of my other mentioned co-pending application does disclose a very simple and unique hydrogen generator.

In my co-pending patent application Ser. No. 315,945, filed Oct. 18, 1981 there is disclosed a combustion system having utility in a mechanical drive system. Particularly in one instance to drive a piston in an automotive device. There is shown a hydrogen generator for developing hydrogen gas, and perhaps other non-volatile gasses such as oxygen and nitrogen. The hydrogen gas with the attendant non-volatile gasses are fed via a line to a controlled air intake system. The combined hydrogen, non-volatile gasses, and the air after inter-mixing are fed to a combustion chamber where it is ignited. The exhaust gasses of the combustion chamber are returned in a closed loop arrangement to the mixing chamber for the mixture of volatile and non-combustible gasses. Particular applications and structural embodiments of the system are disclosed.

SUMMARY OF INVENTION

The system of the present invention in its most preferred embodiment is for a combustion system utilizing hydrogen gas; particularly to drive a piston in an automobile device. The system utilizes a hydrogen generator for developing hydrogen gas. The hydrogen gas and

other non-volatile gasses are fed to a mixing chamber also having oxygen fed thereto. The mixture is controlled to regulate the burning temperature; that is, to lower the temperature velocity of the hydrogen gas to that of the commercial fuels. The hydrogen gas feed line to the combustion chamber includes a fine linear control gas flow valve. An air intake is the source of oxygen and it also includes a variable valve. The exhaust gasses from the combustion chamber are utilized in a controlled manner as the non-combustible gasses.

The hydrogen generator is improved upon to include a holding tank to provide a source of start-up fuel. Also, the hydrogen gas generator includes a switch to the power source operable from one position to another dependant upon a pressure sensing switch on the combustion chamber.

The simplified structure includes a series of one-way valves, safety valves, and quenching apparatus. The combination of apparatus comprises the complete assembly for converting the standard automobile engine from gasoline (or other fuels) to the hydrogen gas mixture.

OBJECTS

It is accordingly a principal object of the present invention to provide a combustion system of gasses combined from a source of hydrogen and non-combustible gasses.

Another object of the invention is to provide such a combustion system that intermixes the hydrogen and non-combustible gasses in a controlled manner and thereby control the combustion temperature.

A further object of the invention is to provide such a combustion system that controls the fuel flow to the combustion chamber in a system and apparatus particularly adapted to hydrogen gas.

Still other objects and features of the present invention will become apparent from the following detailed description when taken in conjunction with the drawings in which:

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is a mechanical schematic illustration partly in block form of the present invention in its most preferred embodiment.

FIG. 1.

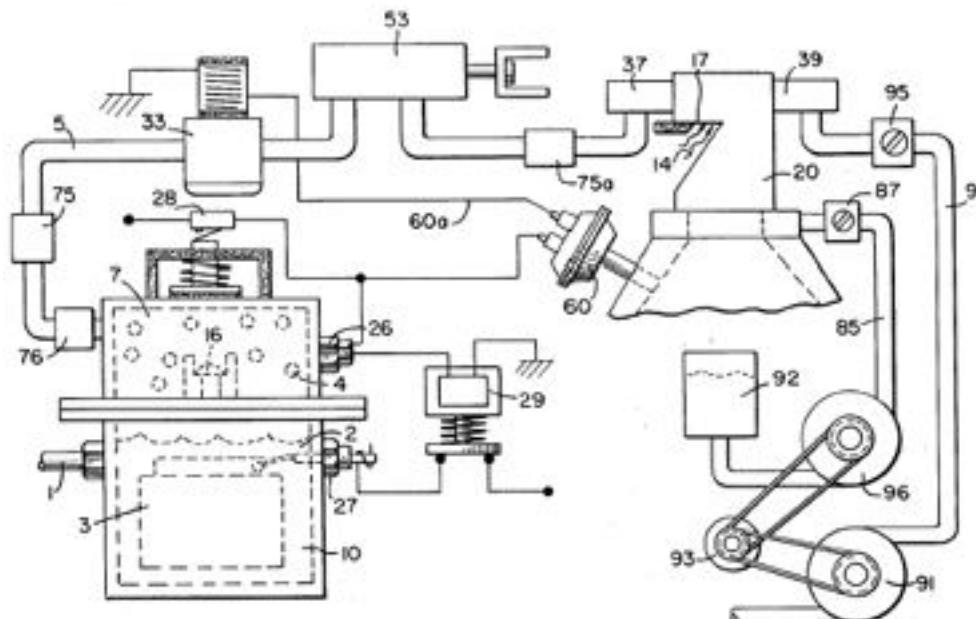


FIG. 2 is a block schematic illustration of the preferred embodiment of the hydrogen injector system of FIG. 1.

FIG. 2.

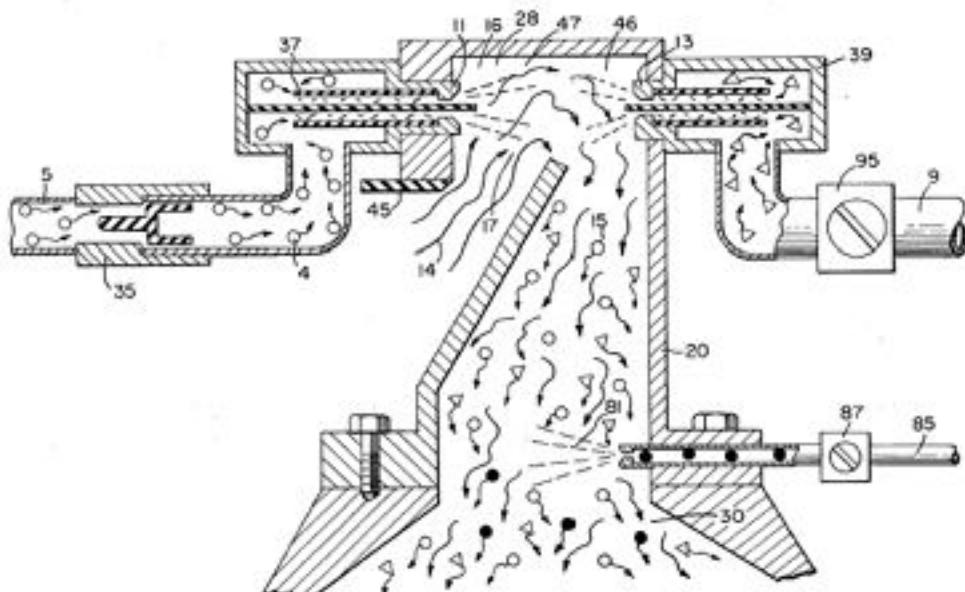


FIG. 3 is the fine linear fuel flow control shown in FIG. 1.

FIG. 3.

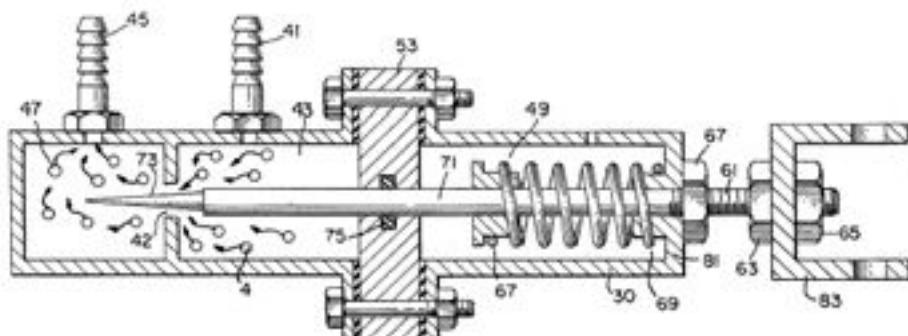


FIG. 4 is cross-sectional illustration of the complete fuel injector system in an automobile utilizing the concepts of the present invention.

FIG. 4.

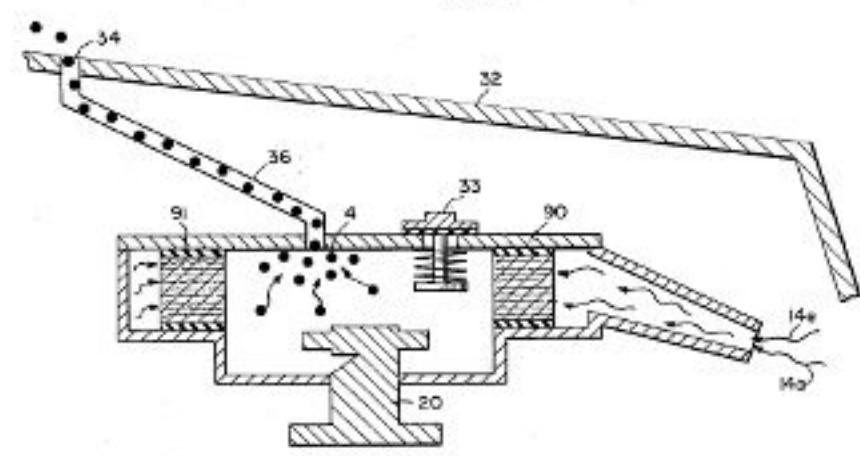


FIG. 5 is a schematic drawing in a top view of the fuel injector system utilized in the preferred embodiment.

FIG. 5.

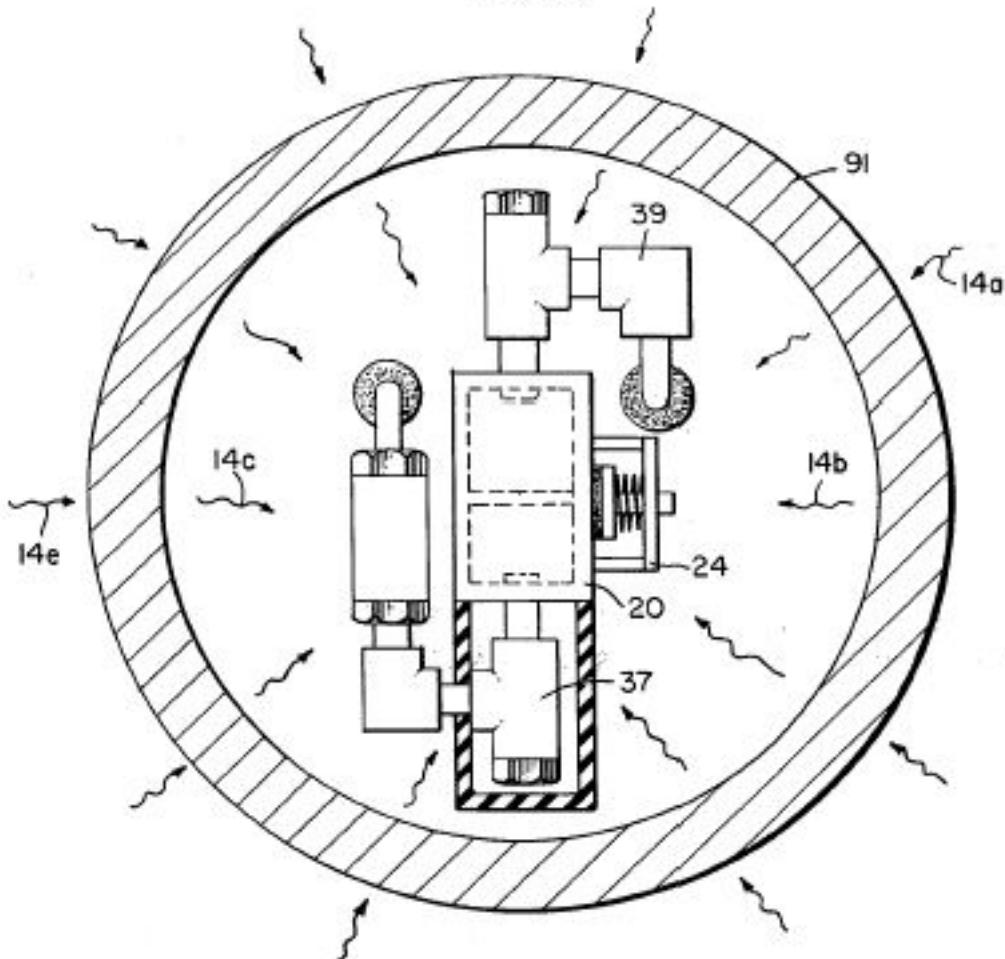


FIG. 6 is a cross-sectional side view of the fuel injector system in the present invention.

FIG. 6.

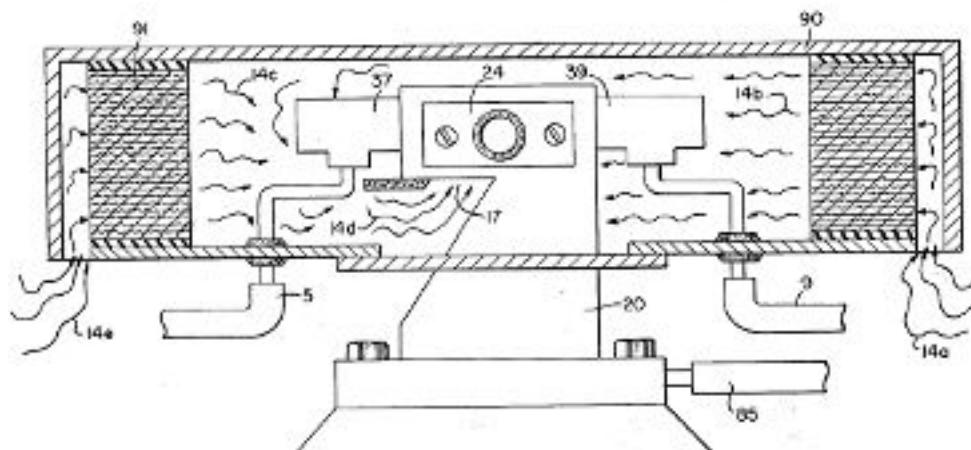


FIG. 7 is a side view of the fuel mixing chamber.

FIG. 7.

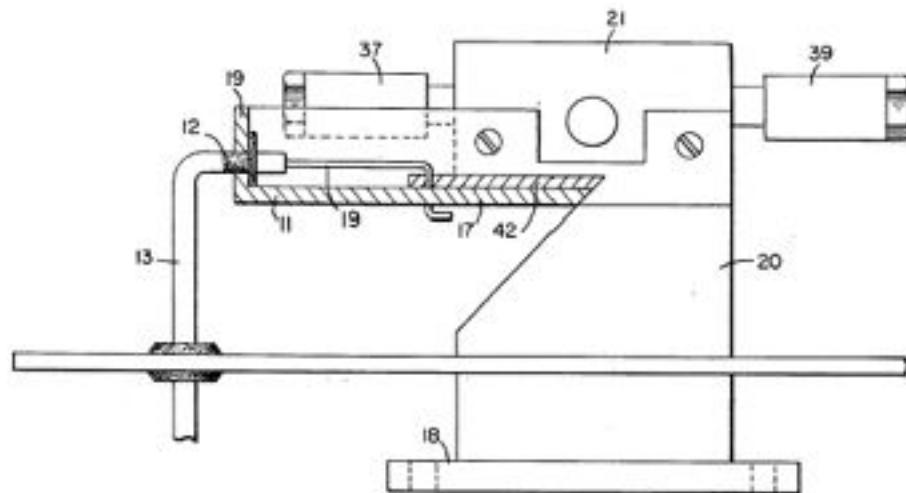


FIG. 8 is a top view of the air intake valve to fuel mixing chamber.

FIG. 8.

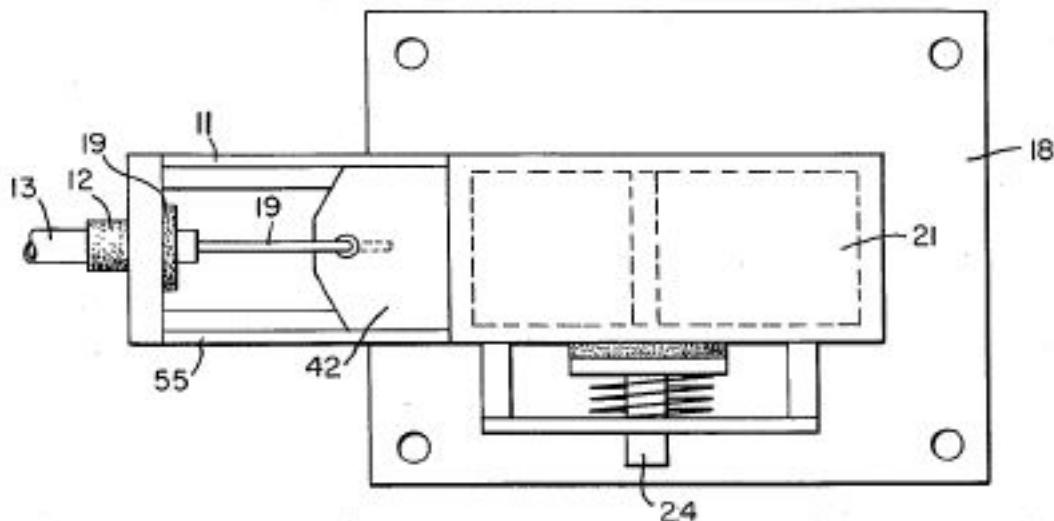
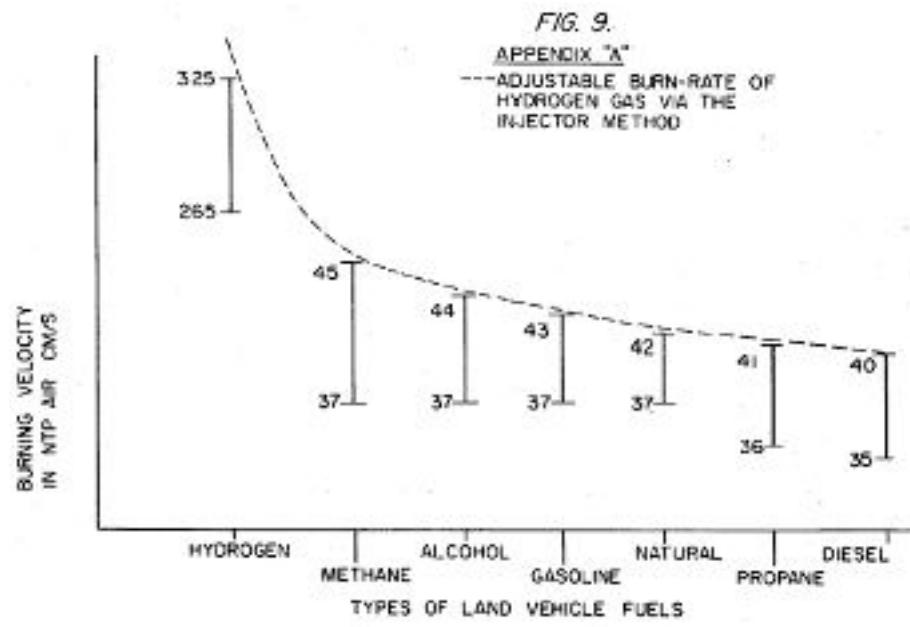


FIG. 9 is a comparison of the burning velocity of hydrogen with respect to other fuels.



DETAILED DESCRIPTION OF INVENTION TAKEN WITH DRAWINGS

Referring to FIG. 1 the complete overall gas mixing and fuel flow system is illustrated together for utilization in a combustion engine particularly an engine utilized in an automobile.

With specific reference to FIG. 1, the hydrogen source 10 is the hydrogen generator disclosed and described in my co-pending application, supra. The container 10 is an enclosure for a water bath 2. Immersed in the water 2 is an array of plates 3 as further described in my co-pending application, supra. Applied to plates 3 is a source of direct current potential via electrical inlet 27. The upper portion 7 of the container 10 is a hydrogen storage area maintaining a predetermined amount of pressure. In this way for start up there will be an immediate flow of hydrogen gas. To replenish the expended water the generator provides a continuous water source 1. Thereafter, the generator is operable as described in the aforesaid patent application.

The safety valve 28 is rupturable upon excessive gas build-up. Whereas the switch 26 is a gas pressure switch to maintain a predetermined gas pressure level about a regulated low-volume.

The generated hydrogen gas 4 is fed from the one-way check valve 16 via pipe 5 to a gas mixing chamber 20, wherein the hydrogen gas is inter-mixed with non-combustible gasses via pipe line 9 from a source hereinafter described.

In the event one way valve 75 should fail and there be a return spark that might ignite the hydrogen gas 4 in the storage area 7 of hydrogen generator 10, quenching assembly 76 will quench the spark and prevent such ignition.

With particular reference to FIG. 2 the hydrogen gas via pipe line 5 and non-combustible gasses via pipe line 9 are fed to a carburator (air-mixture) system 20 also having an ambient air intake 14.

The hydrogen gas 4 is fed via line 5 through nozzle 11 in a spray 16 in to the trap area 46 of the mixing chamber 20. Nozzle 11 has an opening smaller than the plate openings in the quenching assembly 37, thereby preventing flash back in the event of sparking. The non-volatile gasses are injected into mixing chamber 20 trap area 47 in a jet spray 17 via nozzle 13. Quenching assembly 39 is operable much in the same manner as quenching assembly 37.

The ambient air is, in the preferred arrangement, the source of oxygen necessary for the combustion of the hydrogen gas. Further, as disclosed in the aforesaid co-pending application the non-volatile gasses are in fact the exhaust gasses in a closed loop system. It is to be understood that the oxygen and/or the non-combustible gasses can be from an independant source.

With continued reference to FIG. 2 the gas trap area 47 is a predetermined size. In that hydrogen is lighter than air, the hydrogen will rise and become entrapped in the are 47. The size of area 47 is sufficient to contain enough hydrogen gas for instant ignition upon start up of the combusiton engine.

It will be noted that the hydrogen gas is injected in the uppermost region of the trap area 47. Hydrogen rises at a much greater velocity than oxygen or non-combustible gasses; perhaps three times or greater. Therefore, if the hydrogen gas entered the trap area 47 (mixing area) at its lowermost region the hydrogen gas would rise so rapidly that the air could not mix with the oxygen. With the structure shown in FIG. 2 of the trap area 47, the hydrogen gas is forced downwardly into the air intake 15. That is, the hydrogen gas is forced downwardly into the upwardly forced air and readily mixed therewith.

The ratio of the ambient air (oxygen) 14 and the non-combustible gas via line 9 is a controlled ratio and determined by the particular engine. Once the proper combustion rate is determined by the adjustment of valve 95 for varying the amount of the non-combustible gas and the adjustment of valve 45 for varying the amount of the ambient air, the ratio is maintained.

In a system wherein the non-combustible gasses are the exhaust gasses of the engine in a closed loop-arrangement, and wherein the air intake is under the control of the engine, the flow velocity and hence the air/non-combustible mixture, is maintained by the acceleration of the engine.

The mixture of air with non-combustible gasses becomes the carrier for the hydrogen gas.

That is, the hydrogen gas is superimposed on the air/non-combustible mixture. By varying the amount of hydrogen gas superimposed on the air/non-combustible mixture, the r.p.m. of the engine is controlled.

Reference is made to FIG. 3 illustrating precisely in a side view crosssection the fine linear fuel flow control 53. The hydrogen gas 4 enters chamber 43 via gas inlet 41. The hydrogen gas passes from chamber 43. The hydrogen gas passes from chamber 43 to chamber 47 via port or opening 42. The amount of gas passing from chamber 43 to chamber 47 is controlled by controlling the port opening 42.

The port opening is controlled by the insertion there through the linearly tapered pin 73. The blunt end of pin 73 is fixed to rod 71. Rod 71 passes by supporting O-ring 75, through opening 81 in housing 30, to manual adjustment mechanism 83.

The spring 49 retains the rod 71 in a fixed position relative to the pin 73 and opening 42. Upon actuating the mechanism 83, the pin 73 will recede from the opening 42 thereby increasing the amount of gas passing from chamber 43 to chamber 47.

The stops 67 and 69 maintain spring 49 in its stable position. The position of the pin 73 in a fixed position relative to opening 42 is adjusted via threaded nuts 63 and 67 on threaded rod 61. That is, the threaded adjustment controls the idle speed or permits the minimum amount of gas to pass from chamber 43 to chamber 47 for continuous operation of the combustion engine.

Referring now to FIG. 8 there is illustrated the air adjustment control for manipulating the amount of air passing into the mixing chamber 20. The closure 21 mounted on plate 18 has an opening 17 on end 11 thereof. Slideably mounted over said opening 17 is a plate control 42. The position of the plate relative to the opening 17 is controlled by the position of the control rod 19 passing through a grommet 12 to control line. In event of malfunction that may cause combustion of gasses in mixing chamber 20, release valve 24 will rupture.

With reference now to FIG. 4, in the event hydrogen gas 4 should accumulate in the mixing chamber 20 to excessive pressure, an escape tube 36 connected to a port 34 on the automobile hood 32 permits the excess hydrogen gas to safely escape to the atmosphere. In the event of a malfunction that may cause combustion in the mixing chamber 20, the pressure relief valve 33 will rupture expelling hydrogen gas without combustion.

In the constructed arrangement of FIG. 1, there is illustrated a gas control system that may be retrofitted to an existing automobile internal combustion engine without changing or modifying automobile's design parameters or characteristics.

The flow of the hydrogen volatile gas is, of course, critical; therefore, there is incorporated

in line 5 a gas flow valve 53 (FIG. 1) to adjust the hydrogen flow. Gas flow valve is described in detail with reference to FIG. 3.

The intake air 14 may be in a carburetor arrangement with an intake adjustment 55 that adjusts the plate 42 opening and also more fully described with reference to FIG. 8.

To maintain constant pressure in hydrogen gas storage 7 in the on-off operation of the engine, the gas flow control valve is responsive to the electrical shut-off control 33. The constant pressure permits an abundant supply of gas on start up and during certain periods of running time in re-supply.

The switch 33 is in turn responsive to the vacuum control switch 60. During running of the engine vacuum will be built up which in turn leaves switch 33 open by contact with vacuum switch 60 through lead 60a. When the engine is not running the vacuum will decrease to zero and through switch 60 will cause electrical switch 33 to shut off cutting off the flow of hydrogen gas to the control valve 53.

As low-voltage direct current is applied to safety valve 28, solenoid 29 is activated. The solenoid applies a control voltage to the hydrogen generator exciter 3 via terminal 27 through pressure switch 26. As the electrical power activates electric solenoid 29, hydrogen gas is caused to pass through flow adjustment valve 16 and then outlet pipe 5 for utilization. The pressure differential hydrogen gas output to gas mixing chamber 20 is for example 30 lbs. to 15 lbs. Once hydrogen generator 10 reaches an optimum gas pressure level, pressure switch 26 shuts off electrical power to the hydrogen excitors. If the chamber pressure exceeds a predetermined level, the safety release valve 28 is activated disconnecting the electrical current and thereby shutting down the entire system for safety inspection.

With particular reference now to FIG. 6 there is illustrated the fuel injector system in a side crossectional view and to FIG. 5 in a top view. The structural apparatus incorporated in the preferred embodiment comprises housing 90 having air intakes 14a and 14e. The air passes through filter 91 around the components 14b and 14c and then to intake 14d of the mixing chamber 20. The hydrogen enters via line 5 via quenching plates 37 and into the mixing chamber 20. The non-volatile gasses pass via line 9 to the quenching plates 39 and into the mixing chamber 20.

FIG. 7 illustrates the mechanical arrangement of components comprising the overall structure of the mixing chamber 20 and shown independantly in the other figures.

Returning to FIG. 1 there is illustrated the non-volatile gas line 9 passing through mixture pump 91 by engine pulley 93. Valve 95 controls the rate of flow.

Also driven by pulley 93 is pump 96 having line 85 connected to an oil reservoir 92 and valve 87 and finally to mixing chamber 20. As a practical matter, such as in a non-oil lubricated engine, lubricating fluid such as oil 81 is sprayed in the chamber 20, via oil supply line 85 for lubrication.

There has been several publications in the past year or so delving on the properties of Hydrogen gas, its potential use, generating systems, and safety. One such publication is "Selected Properties of Hydrogen" (Engineering Design Data) issued February 1981 by the National Bureau of Standards.

These publications are primarily concerned with the elaborate and costly processes for generating hydrogen. Equally so, they are concerned with the very limited use of hydrogen gas because of its extremely high burning velocities. This in turn reflects the danger in the practical use of hydrogen.

With reference to the graph of the Appendix A, it is seen that the burning velocities of alcohol, propane, methane, gasoline, natural gas, and diesel oil are in the range of minimum 35 to maximum 45. Further, the graph illustrates that the burning velocity of hydrogen gas is in the range of 265 minimum to 325 maximum. In simple terms in the order of 7.5 times the velocity of ordinary commercial fuels.

Because of the hydrogen gas unusually high burning velocity, hydrogen gas has been ruled out, by these prior investigators as a substitute fuel. Further, even if an engine could be designed to accommodate such high velocities, the danger of explosion would eliminate any thoughts of commercial use.

The present invention, as above described, has resolved the above-noted criteria for the use of hydrogen gas in a standard commercial engine. Primarily, the cost in the generation of hydrogen gas, as noted in the aforementioned co-pending patent applications, is most minimal. Water with no chemicals or metals is used. Also, as noted in the aforementioned co-pending patent applications, is the reduction in the hydrogen gas velocity. These co-pending applications not only teach the reduction in velocity, but teach the control of the velocity of the hydrogen gas.

In the preferred embodiment, practical apparatus adapting the hydrogen generator to a combustion engine is described. The apparatus linearly controls the hydrogen gas flow to a mixing chamber mixing with a controlled amount of non-combustible gas oxygen, hence, the reduction in the hydrogen gas velocity. The reduction in the hydrogen gas velocity makes the use of hydrogen as safe as other fuels.

In more practical terms the ordinary internal combustion engine of any size or type of fuel, is retrofitted to be operable with only water as a fuel source. Hydrogen gas is generated

from the water without the use of chemicals or metals and at a very low voltage. The burning velocity of the hydrogen gas has been reduced to that of conventional fuels. Finally, every component or step in the process has one or more safety valves or features thereby making the hydrogen gas system safer than that of conventional automobiles.

In the above description the terms non-volatile and non-combustile were used. It is to be understood they are intended to be the same; that is, simply, gas that will not burn.

Again, the term storage has been used, primarily with respect to the hydrogen storage area 7. It is not intended that the term "storage" be taken literally--in fact it is not storage, but a temporary holding area. With respect to area 7, this area retains a sufficient amount of hydrogen for immediate start-up.

Other terms, features, apparatus, and the such have been described with reference to a preferred embodiment. It is to be understood modifications and alternatives can be had without departing from the spirit and scope of the invention.

Molecular Dissociation of Water:

A Project for the Experimenter

by Dan Danforth

In the original setup that Stan Meyer showed us, he used 36 volts as the basic potential applied to the reaction chamber. He also commented that stainless steel (410 not 403) was the only metal that could be used as oxides formed with all others. His original chamber used 18 inch long by 0.375 inch diameter (o.d.) rod surrounded by 1 inch diameter (i.d.) 16 inch long pipe. The reason for the difference in length is for mechanical ease of construction. My prototype used 14 inch long rod and 12 inch long pipe of similar diameters as the drawing indicates.

Having a severe lack of parts diversity here in Sri-Lanka, I was only able to obtain a 24 volt. 8 amp transformer and built my circuitry around that. The final output is 20 volts with M1 reading 10 amps to the pulsing circuit which generates a symetricel squarewave (50% duty cycle) to the flyback inductor connected in series with the chamber as the schematic shows. The flyback high voltage spike is directed across the chamber via c* and d*. The use of a high voltage spike alone, without the current being delivered through the liquid, will not cause the disassociation to take place. This I verified using an ignition coil in place

of the inductor and applied the secondary with halfwave rectification and blocking capacitor to prevent burn out to the chamber with no results. Apparently the current in the water aligns the molecules appropriately to allow the high voltage spike to do its work which in my opinion is the stimulation of molecular resonance. Once Stan's unit was made to begin breakdown (which takes 6 to 8 seconds) he was able to reduce both current and voltage to minuscule proportions. I attribute this to sympathetic oscillation of the aligned molecules, requiring very little in the way of additional excitation. A phenomena akin to Tesla's super resonance... resulting in Stan discovering that he only had to supply three pulses in ten to satisfy the requirement of the chamber. I have not yet had the opportunity to duplicate this portion of the experiment but, in time I will.

Duplication of the device described in these pages, however, will produce the phenomena and hopefully launch other enterprising and inventive souls on to designing their own refined models. It would be nice to have feedback so that we can all collectively work to bring about the transition to non-pollution energy.

P.S.- Though electrical circuit is by no means optimised, but represents instead the result of parts availability here. Any good technician could improve on it quite readily.

There are two primary frequencies that produce the best results. They are: 14,372 Hz and 43,430 Hz. The former is about 50% more efficient, but it seems that just about any frequency between 9 KHz and 143,762 KHz works quite well. (1) This is because the nature of the wave form (a spike) is rich in harmonics and one of them is bound to be close to one of the two primary frequencies.

Use of permanent magnets may also increase efficiency. I'll give you the outcome of that attempt in my next letter along with the plans for what I hope to be a much improved version.

Note: Sub-harmonics of the two primary frequencies at which dissociation will occur:

43430 Hz	143762 Hz
SUBHARMONIC	SUBHARMONIC
1st 21715 Hz	1st 71881 Hz
2nd 14476.67 Hz	2nd 47920.67 Hz
3rd 15517.5 Hz	3rd 35840.1 Hz
4th 8686	4th 28752.4 Hz

*1500 VOLTS IS THE MINIMUM REQUIRED FOR MOLECULAR RINGING TO BEGIN.

Source publication: Unknown... Scanned from very bad photocopy.

Excerpts from *Water Fuel Cell News Release # 4 (Winter/Spring 87/88)*

"The Birth of New Technology: The Hydrogen Fracturing Process & Related Water Fuel Cell Technology"

by Marcia Thompson

The purpose of establishing the Hydrogen Fracturing technology which has been developed is to use energy from the atom to produce a system which would lend itself to mass production. Meyer is now in the process of integrating the Electrical Polarization Generator (EPG) into the Hydrogen Fracturing Process. The Electrical Polarization Generator is in essence a gas battery which produces electric energy directly from the fuel cell gases without chemical interaction. The significance of the voltage is that it is a potential energy source, not consumed energy. The most significant point is that the influence of voltage has a phenomenal effect on the splitting of the water molecule and does it in a controlled state. Voltage from the Electrical Polarization Generator separates the water molecule economically by not consuming power. It's a new technology --- bringing the water molecule from a liquid to gas ionization state, which in turn sets up the Hydrogen Fracturing Process of destabilization of the gas atoms to release their atomic energy. The process consumes very little power to accomplish this task.

The Voltage Intensifier Circuit (VIC) patent development had to be fully developed to bring on the voltage phenomenon where very low energy is being consumed.

In conjunction with this development, a new Electron Grid Extractor Circuit (EGEC) has been fully developed to extend the operability of the Hydrogen Gas Gun technology, which sets up the hydrogen fracturing process. The Voltage Intensifier Circuit patent development and Electron Grid Extraction Circuit had to be fully developed to bring on the voltage phenomenon where very low energy is being consumed.

What is this Hydrogen Fracturing Process? Since the Water Fuel Cell (WFC) dissociates the water molecule by the stimulation of voltage, this voltage technology has now been applied to the Fuel Cell gas atoms to release their atomic energy. Meyer discovered that not only can the water molecule be split into its component parts, but it is also possible to separate the atoms of gases into their component parts by the same voltage stimulation, releasing a tremendous amount of thermal explosive energy from the atom under a controlled state. Under this process, preliminary tests show that energy yields from one gallon of water are predicted to equal that of 44,000 to 108,000 barrels of oil. The Hydrogen Fracturing Process is environmentally safe since the gas atoms are split into

their component parts, releasing explosive thermal energy from the gas atom. The nucleus remains intact.

In conjunction to the Hydrogen Fracturing Process of the Water Fuel Cell technology, Meyer is now working out systems mechanics of retrofitting the EPG system to the entire Water Fuel Cell system. The entire systems mechanics are now being integrated together into a package system which, when miniaturized, will lend itself to production. All of these previous steps have been necessary to ensure the system lends itself to the economics of mass production with costs held down.

Beyond the Electrical Particle Generator (EPG) system, which utilizes a magnetized gas to produce electrical energy, work is continuing on the Electrical Polarization Generator to optimize its operational performance, which is also required for mass production. The EPG system is now being prepared for design interfacing with the existing WFC technology.

To reach the maximum operational effect of the EPG system, several types of magnetized gases are being developed and tested. Meyer is also developing the technology to enhance the electromagnetic deflection of the gas to optimize the EPG system still further. This development phase is now being considered for systems economics with regard to manufacturing techniques.

What does the Hydrogen Fracturing Process (HFP) really do for the system? It destabilizes the mass and electrical equilibrium of the gas atoms, bringing them into a critical state for energy utilization.

The electronics control system determines systems operation and efficiency and is part of the HFP. It complies with both US and foreign patent requirements. It establishes electric circuit interfacing for the operability and efficiency of the HFP. In mass production, it will be reduced to a small, simple circuit component. The control system triggers the HFP and maintains control of it.

The Hydrogen Gas Injector Fuel Cell (HGIFC) is composed of resonant cavities (lower section) in a vertical array which splits water molecules into component parts by stimulation of a high pulse voltage frequency, setting up the resonant action. The liberated hydrogen and oxygen atoms and ambient air gases are stimulated from a liquid to gas ionization state prior to entering the Hydrogen Gas Gun (HGG), located on top of the resonant cavities. Gases are then allowed to go into the Hydrogen Fracturing Process. The thrust nozzle, located at the very top of the system, is an optical thermal lens affixed to the unit which triggers and sustains the Hydrogen Fracturing Process as to the flow rate of fuel cell gases. In mass production, the whole unit forms the Gas Injector Fuel Cell (GIFC). The complete unit will be reduced to a small, extremely light-weight unit. The Hydrogen Fracturing Process is completely environmentally safe. There are no radioactive materials

used in the process, and it applies to all EPA standards, plus safety, housing and highway codes...

Hydrogen Gas Gun

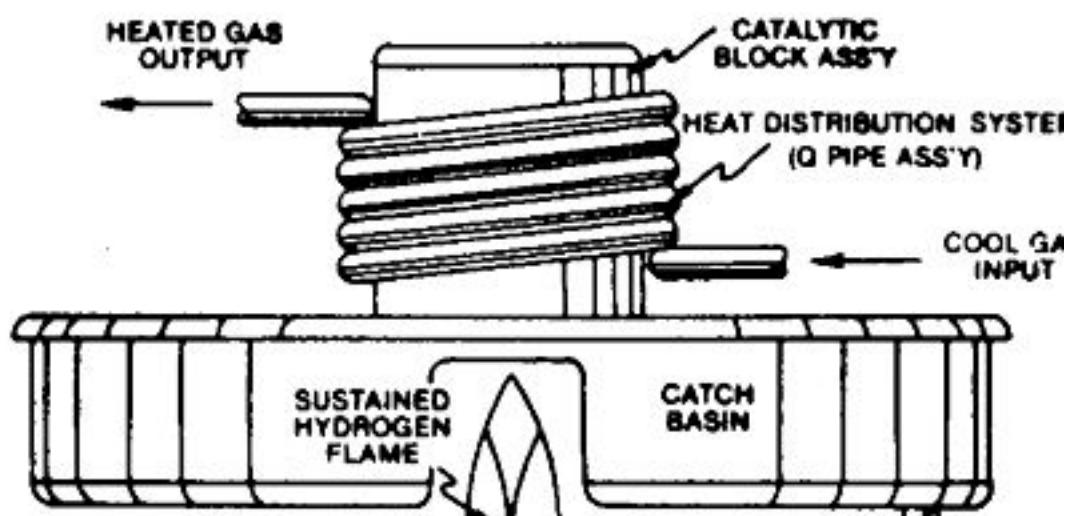


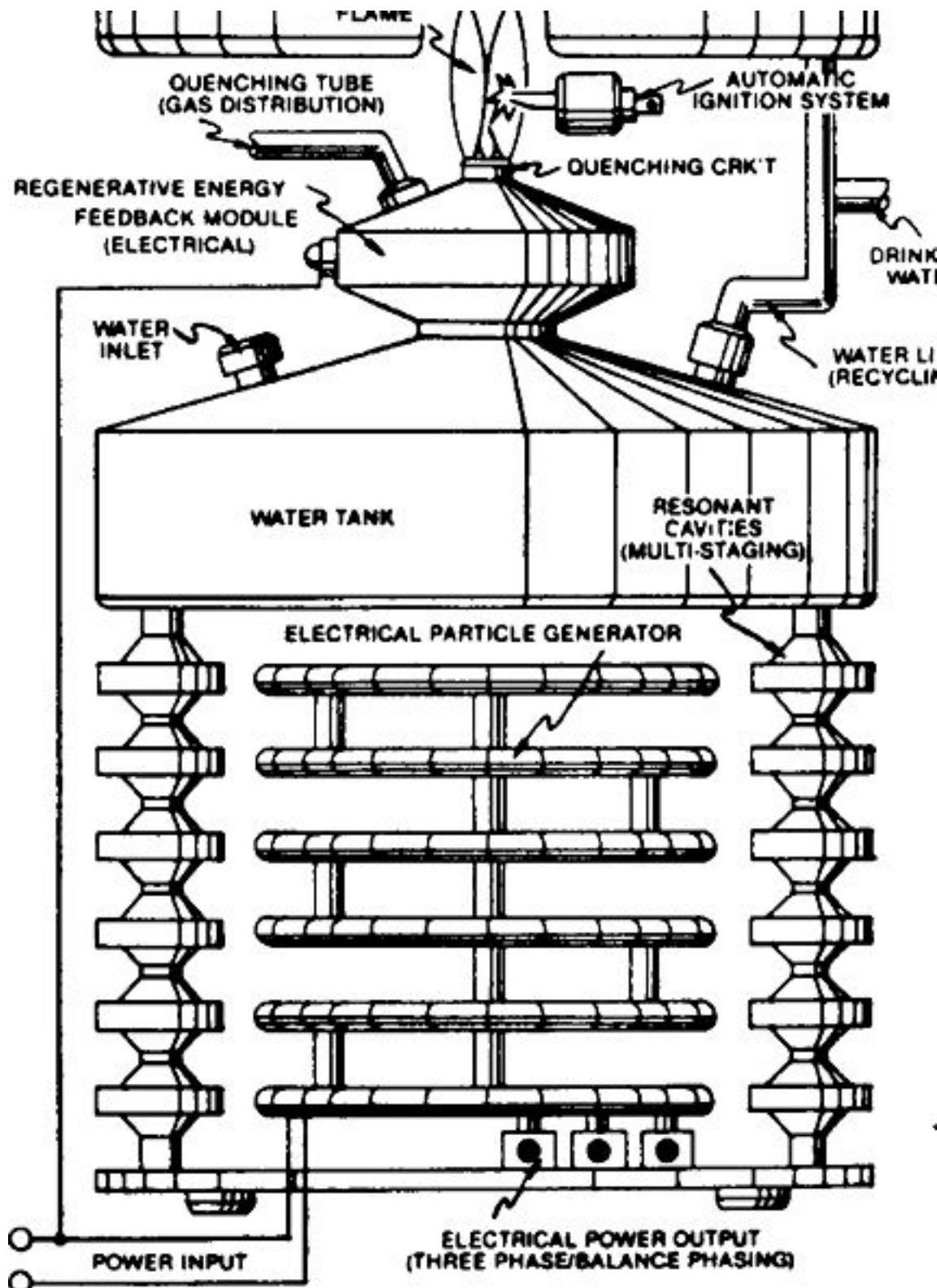


Hydrogen Gas Gun



Water Fuel Cell





WATER FUEL CELL

Excerpts from **Raum & Zeit** 1(6):63-68 (1990) ~

Hydrogen Gas Gun ~

The Electron Extraction Circuit removes, captures, and consumes the "dislodged" electrons (from the gas atoms) to cause the gas atoms to go into and reach "Critical State", forming highly energized combustible gas atoms having missing electrons. Resistive values (R4, R6, R7) and dielectric constant of gas (Rg) and isolated ground (W) prevents "electron-flow" or "electron deflection" from occurring within the circuit during pulsing operations (at resonant frequency) and, therefore, keeps the gas atoms in critical state by not allowing electron replacement to occur or take place between the moving gas atoms. The "dislodged" negative charged electrons are "destroyed" or "consumed" in the form of heat when Amp Consuming Device (S) such as a light bulb) is positively electrically energized during alternate pulsing operations. Laser activated or laser primed gas ions repel the dislodged electrons being consumed. The Electron Extraction Process is hereinafter called the "Hydrogen Gas Gun" and is placed on top of a Resonant Cavity Assembly.

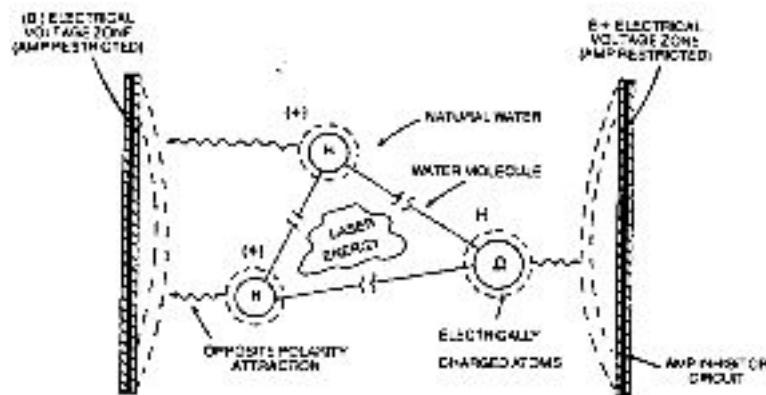
Thermal Explosive Energy ~

Exposing the expelling "laser-primed" and electrically charged combustible gas ions (exiting from the Gas Resonant Cavity) to a thermal spark or heat zone causes thermal gas ignition, releasing Thermal Explosive Energy (gtnt) beyond the Gas-Flame Stage...

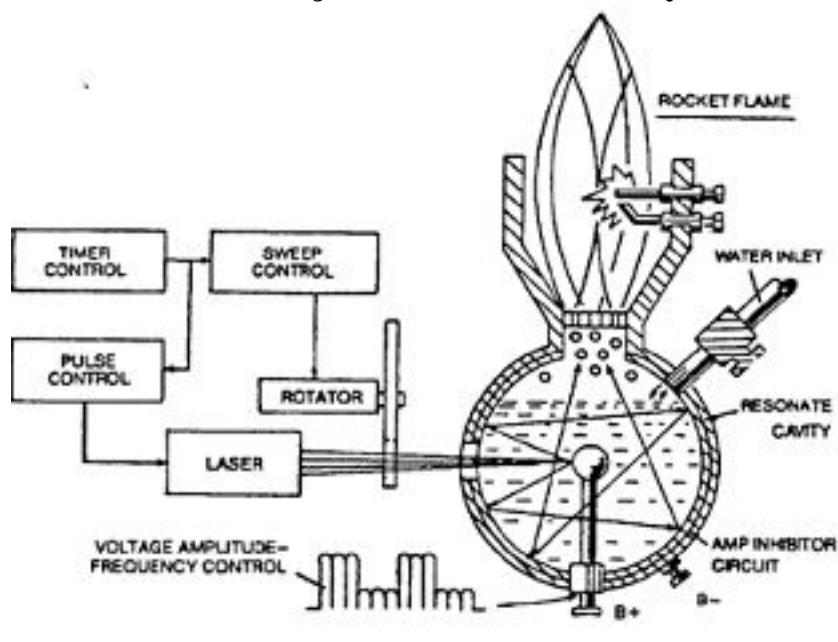
Thermal Atomic interaction (gtnt) is caused when the combustible gas ions (from water) fail to unite or form a Covalent Linkup or Bond between the water molecule atoms. The oxygen atom having less than four covalent electrons (Electron Extraction Process) is unable to reach "Stable State" (6 to 8 covalent electrons required) when the two hydrogen atoms seek to form the water molecule during thermal gas ignition. The absorbed laser energy (Va, Vb, and Vc) weakens the electrical bond between the orbital electrons and the nucleus of the atom. And, electrical attraction force being stronger than normal due to the lack of covalent electrons, "locks onto" and "keeps" the hydrogen electrons... This Atomic Thermal Interaction between combustible gas opns is from now on called the "Hydrogen Fracturing Process".

By simply attenuating or varying the voltage amplitude in direct relationship to voltage pulse rate determines Atmomic Power Yield under control state...

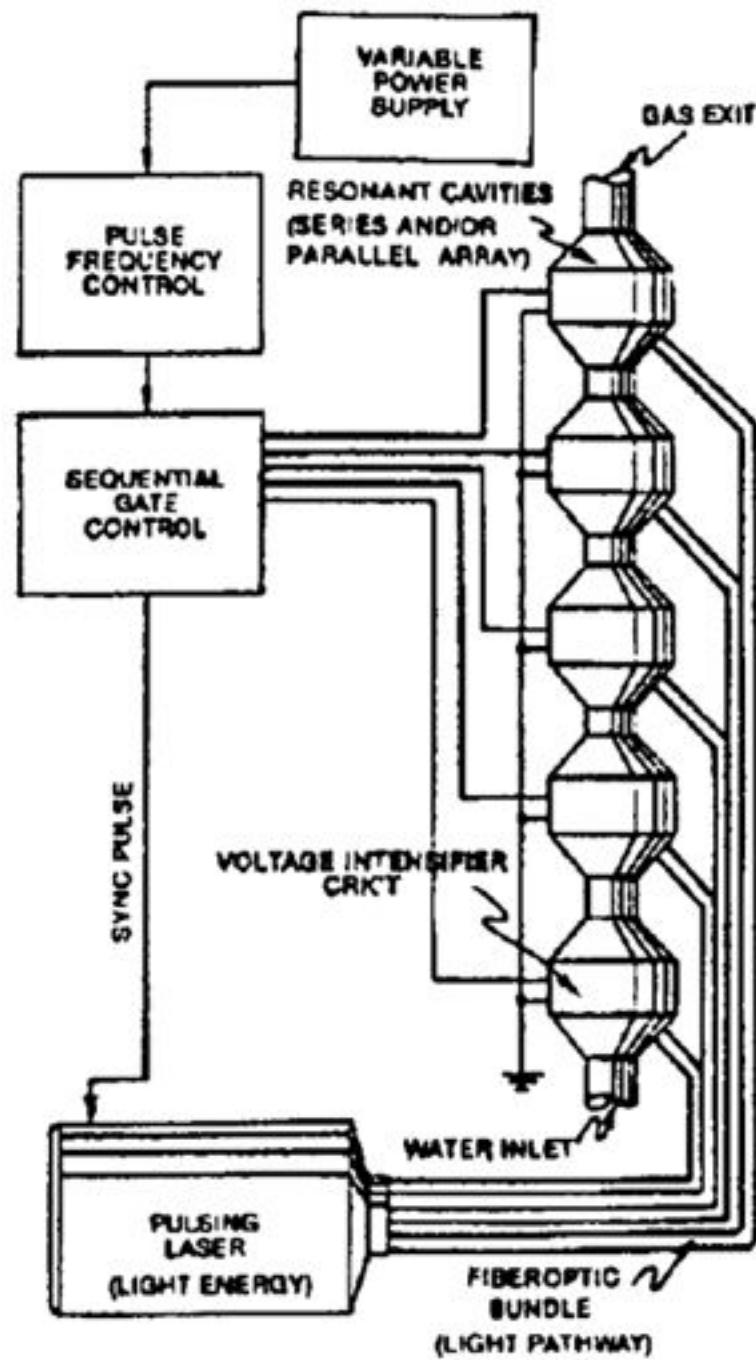
Photon Energy Aids Resonant Action



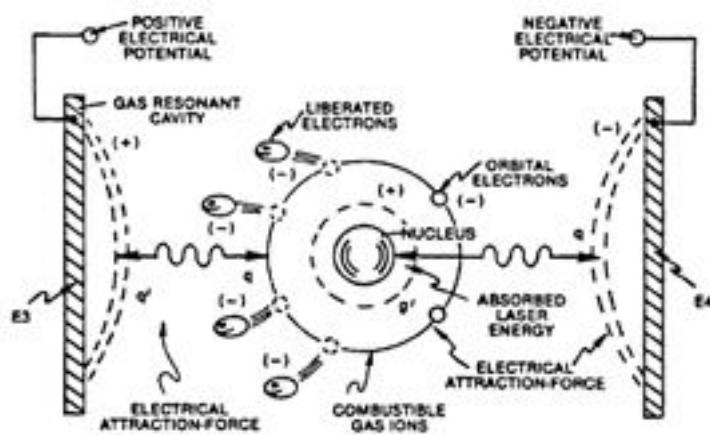
Laser-Injected Resonant Cavity

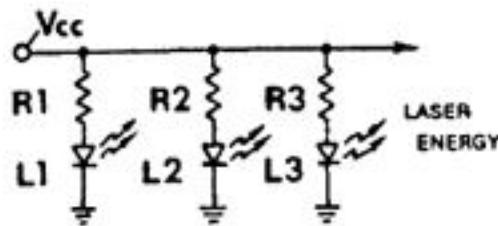
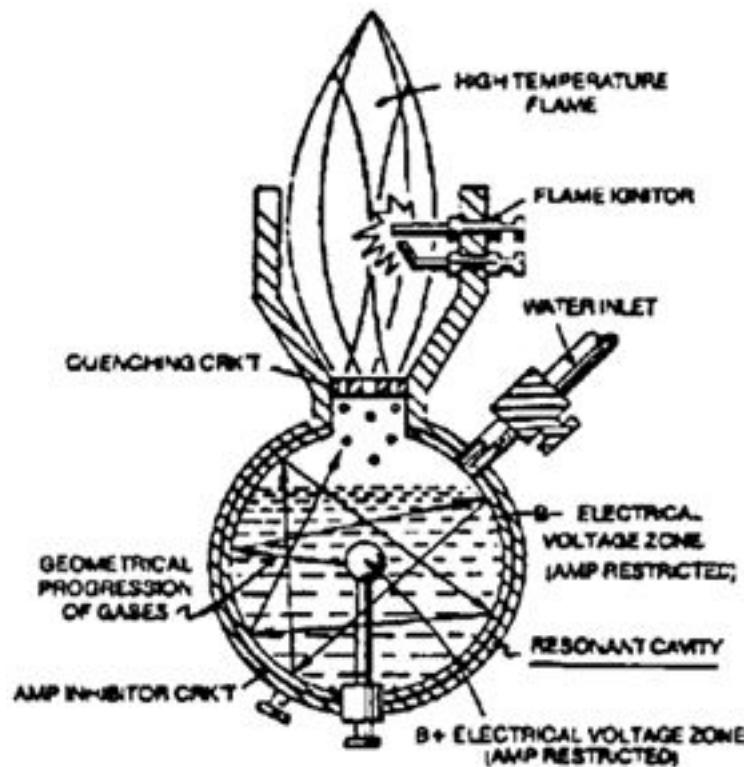
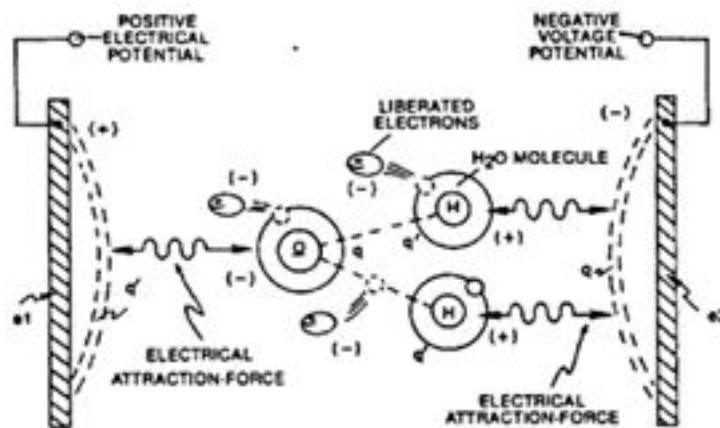


Power Load Distributor

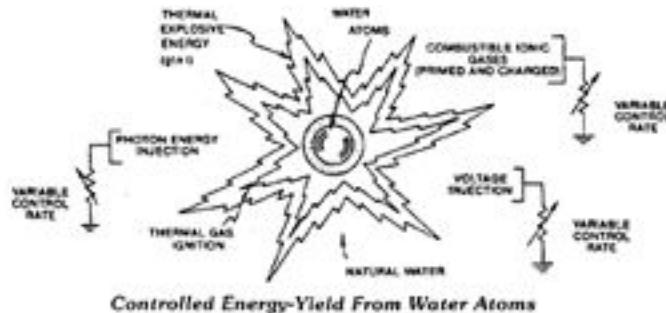


Destabilizing Combustible Gas Ion



LED Laser Array**Electrical Voltage Zone (Laser-Injected Resonant Cavity)****Destabilizing Combustible Gas Ion**

Controlled Energy Yield from Water Atoms



Patents Granted

USP # 4,936,961 - Method for the Production of a Fuel Gas

USP # 4,826,581 - Controlled Production of Thermal Energy from Gases

USP # 4,798,661 - Gas generator voltage control circuit

USP # 4,613,779 ~ Electrical Pulse Generator

USP # 4,613,304 ~ Gas Electrical H Generator

USP # 4,465,455 ~ Start-up/Shut-down for H Gas Burner

USP # 4,421,474 ~ H Gas Burner

USP # 4,389,981 ~ H Gas Injector System for IC Engine

USP # 4,275,950 ~ Light-Guide Lense

USP # 3,970,070 ~ Solar Heating System

USP # 4,265,224 ~ Multi-Stage Solar Storage System

USP # 3,970,070 - Solar heating system

Canada Patent # 1,231,872 ~ H Injector System

CP # 1,233,379 ~ H Gas Injector System for IC Engine

CP # 1,235,669 ~ Controleld H Gas Flame

CP # 1,228,833 ~ Gas Electrical H Generator

CP # 1,227,094 ~ H/Air & Non-Combustible Gas Mixing Combustion System

CP # 1,234,774 ~ H Generator System

CP # 1,234,773 ~ Resonant Cavity H Generator...

CP # 1,213,671 ~ Electrical Particle Generator

Water Fuel Cell R&D Format

Fuel Cell Technology:

Electrical Polarization Process ~ Producing H gas economically from water by voltage stimulation

Voltage Intensifier Circuit ~ Controls H gas production on demand

Cluster Array ~ Light manufacturing

Resonant Cavity ~ Home/transportation

Laser-Injected Resonant Cavity ~ Medium industry

Atom-Injected Resonant Cavity ~ Heavy industry

H Fracturing Process ~ Controlled energy yield from water atoms (Aircraft/rockets)

Processed H Gas:

Rendering H Gas Safe ~ Adjust H gas burn rate to co-equal natural gas Quenching Circuit ~ Anti-Spark back

Quenching Tube ~ Distribute H gas without spark ignition

H Ignition ~ Sustain & maintain H flame regardless of gas rate

Startup/Shutdown Electronic Circuit ~ Automatically reignites H gas after flame-out

H Pipeline Storage ~ Transporting H gas through existing pipelines safely

H Gas Reclaim ~ Recycling water for H re-use & producing pure drinking water

Electrical Power Generation:

Electrical Particle Generator (EPG) ~ Using a magnetized gas or slurry to produce electrical energy without any air-gap

EPG Mechanical Drive System ~ To propel said magnetized gas/slurry by mechanical displacement

EPG Electromagnetic Drive System ~ To propel said magnetized gas/slurry by EM deflection

EPG Laser Drive System ~ To propel said magnetized gas/slurry by photon or particle injection

Magnetic Spin Generator ~ Reorient dyne-axis of said magnetized gas/slurry by variable pulse voltage

Spiral Transformer Configuration ~ Pass electrical energy at high pulse voltage frequencies

Electrical Pulsing Generator ~ EM amplifier that produces a variable voltage frequency

Electrical Feedback Network:

Gas Activated Electrical Generator ~ Using a thermal pump to move said magnetized gas/slurry to produce electricity

Internal Combustion Electrical Generator ~ Using IC engine power by processed H gas to move magnetized gas/slurry to produce electricity

Fluid Drive Electrical Generator ~ Using H gas pressure to move magnetized gas/slurry to produce electricity

Electrical Polarization Generator ~ Using electrically charged gas to produce electrical energy

Others:

Steam Resonator ~ Producing superheated steam by polar-voltage stimulation

Light-Guide Lens Assembly ~ Collects, redirects, transfers & focuses solar energy without any moving parts

***Infinite Energy* 19: 50-51 (1998)**

Stanley Meyer, Water-Fuel Cell Inventor & Promoter, Dies Suddenly
by Eugene Mallove

Stanley A. Meyer, the controversial Ohio inventor who had claimed his technology could produce a hydrogen-oxygen mixture with a minimal energy input (compared with conventional electrolysis) died on March 21, 1998. He had gained a world-wide following of adherents and people who had invested in his activities --- Water Fuel Cell (Grove City, OH). He was famous for his claimed "water fueled car" which was exhibited symbolically in the BBC/CBC 1994 documentary on cold fusion, "Too Close to the Sun".

There were also those who were initially curious about Meyer's work, such as the editor of this magazine, the late Christopher Tinsley of the UK, and the late Admiral of the British Navy, Sir Anthony Griffin, but who became frustrated by being unable --- or, more to the point, not allowed --- to confirm (or reject finally) Meyer's claims.

I have absolutely NO DOUBT today that Stanley Meyer was his own worst enemy. IF --- and a very big IF --- he had discovered the technological process that he had said he had, there is no way that a reasonable, straightforward marketing strategy would have failed to make his technology quickly spread worldwide. He could have become very influential and very rich.

There remains a very strong suspicion that he had no such process, even though he conducted a demonstration (before this writer and another engineer at the Meyer lab in 1993) of the production of copious hydrogen/oxygen gas from what visually seemed like a small input power. But Meyer was exceedingly paranoid and he flatly refused reasonable requests by us and others to test the performance --- the input/out power ratio, even with the proviso that we did not have to "look into his black box" of electronics feeding his rather simply constructed stainless steel electrode, alternating current and voltage cell. The last such refusal --- this one in public and recorded on video tape --- was at the ANE meeting in Denver CO in 1997. Then Meyer loudly and falsely protested to me that he

would "lose his patent rights" if he were to release anything but complete, integrated systems --- such as a water-fueled vehicle. Excuses, excuses, excuses...

In 1996, Meyer lost a long-lasting Ohio civil court battle accusing him of "egregious fraud" against a former associate. As was Meyer's custom, he ascribed this and other alleged assaults on him to various conspiracies. To television cameras he suggested that he had been offered huge sums of money to "suppress this technology", but that he had refused those sums. One had the impression that he really believed that there were conspiracies against him. That is a tragedy, a very compounded tragedy if he had actually come up with something novel and useful that he was hiding.

This is a very complex human and scientific story that we shall want to cover in greater detail in a future issue of Infinite Energy. There are other processes and inventions that suggest that splitting water molecules with much greater efficiency than with conventional electrolysis may be possible. Certainly there are other novelties within water --- "cold fusion" to be sure --- that really do produce prodigious quantities of energy, but not in the mode Meyer claimed. For now, here are some of the facts surrounding Meyer's death:

He was apparently eating dinner at a Grove City OH restaurant, when it is reported that he jumped up from the table, yelled that he'd been poisoned", and rushed out into the parking lot, where he collapsed and died. It has been reported by Meyer's associates that Meyer had just secured funding for a \$50 million research center near Grove City, but there is no way to confirm or reject this at the moment.

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