Fuel Cell > What it is? How to make it!

What is a fuel cell?

A fuel cell is a device that converts chemical energy directly into electricity via a modified oxidation process. The process also produces heat, water and carbon dioxide depending upon the fuel used.

Fuel cells operate in reverse of electrolysis. In a fuel cell hydrogen fuel and an oxidizer (oxygen) streams pass through separate porous metal plates separated an electrolyte bath.

The hydrogen plate operates as an anode converting the hyrogen molecules into hydrogen ions an electrons. The electrons flow along the wire connect to the cathode play and the ions migrate into the electrolyte bath. On the cathode side oxygen molecules a re separated into oxygen atoms and migrate into the electrolyte bath where they combine with the hydrogen ions and anode electrons to create H20 (HOH for the purists) and heat.

Electricity can be captured from the anode/cathode circuit and put to useful work. Water and heat are expelled from the electrolyte bath as steam which can be utilized separately or recyled into the fuel and oxidizer streams.

The first fuel cell constructed by Sir William Groves in 1839 used porous platinum electrodes and sulfuric acid (H2SO4) as the electrolyte bath. Later fuel cells such as those constructed by William White Jaques (who incidentally coined the term fuel cell) substituted phosphoric acid H2P2O4 in the electrolyte bath.

the Bacon Cell. Dr. Bacon substituted an acid electrolyte with an alkali electrolyte (potassium hydroxide - KOH). KOH performs as well as acid as an electrolyte and is not as corrosive on the electrodes. The Bacon design was chosen by NASA for the power supply Apollo mission and the STS shuttle orbiters.

fuel cells employ an electrochemical process -- that is, they convert fuel energy to electricity through flameless oxidation.

the main emissions from a fuel cell are water vapor and carbon dioxide.

In a fuel cell, gaseous fuel (such as hydrogen, natural gas, coal gas, methanol, or naphtha) and oxygen (either from the air or purified) flow through porous electrodes, which are only slightly affected by the reactions

Each pair of electrodes can create an electric potential of only up to 1.23 volts, so many pairs are required for generating voltages useful for power-related applications. Current is proportional to the surface area of the electrodes, which means that large plates (about 1 meter square) with porous surfaces must be used. Expensive catalysts are required in low-temperature fuel cells to help accelerate the normally sluggish reactions, but these are not needed at high temperatures. And the electrolyte -- the medium for carrying current inside a fuel cell -- is a relatively poor conductor, so electrolyte-filled membranes separating electrodes are made as thin as possible.

Different kinds of fuel cells are usually named according to the type of electrolyte they use. Three major kinds are now being actively developed for utility applications: phosphoric acid fuel cells (PAFCs), the most highly developed, with major demonstration plants in operation; molten carbonate fuel cells (MCFCs), now entering the demonstration phase of development; and solid oxide fuel cells (SOFCs), which are still in the experimental stage.

Phosphoric acid fuel cells, which operate at about 200 degrees C

with power generation efficiency of 35-45%,

How To:

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.

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 resonate 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 no 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 test 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

- 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, uinpolar 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 co-valent 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.

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 figure 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.

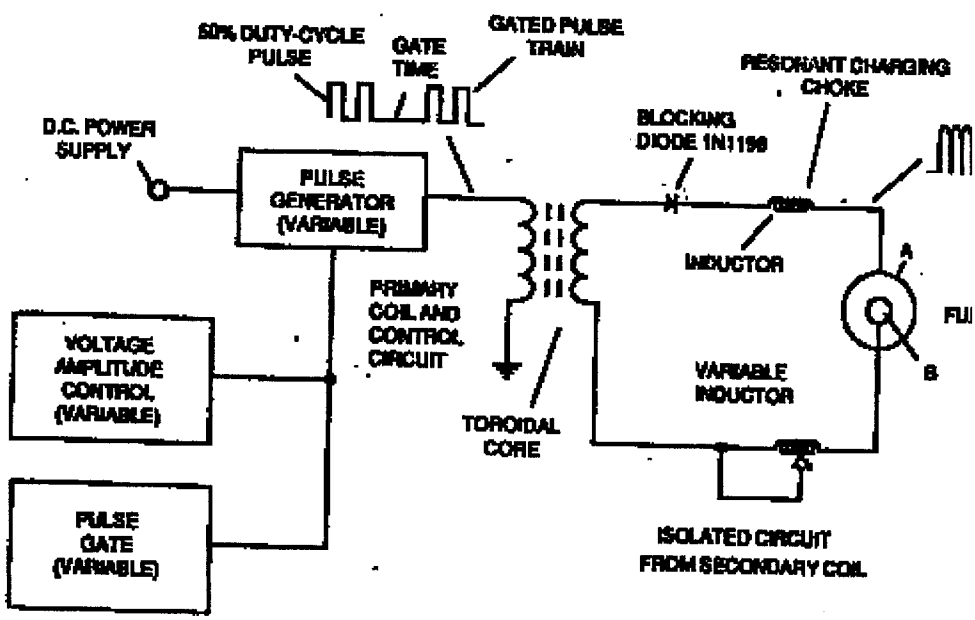
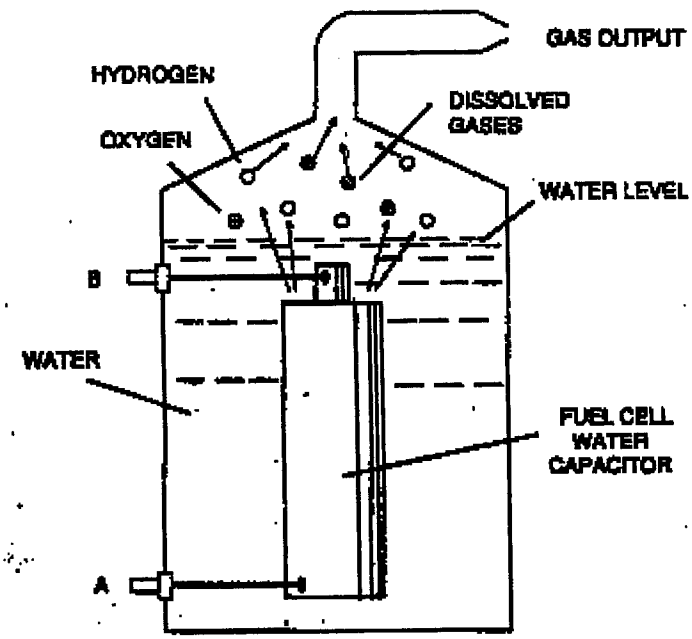
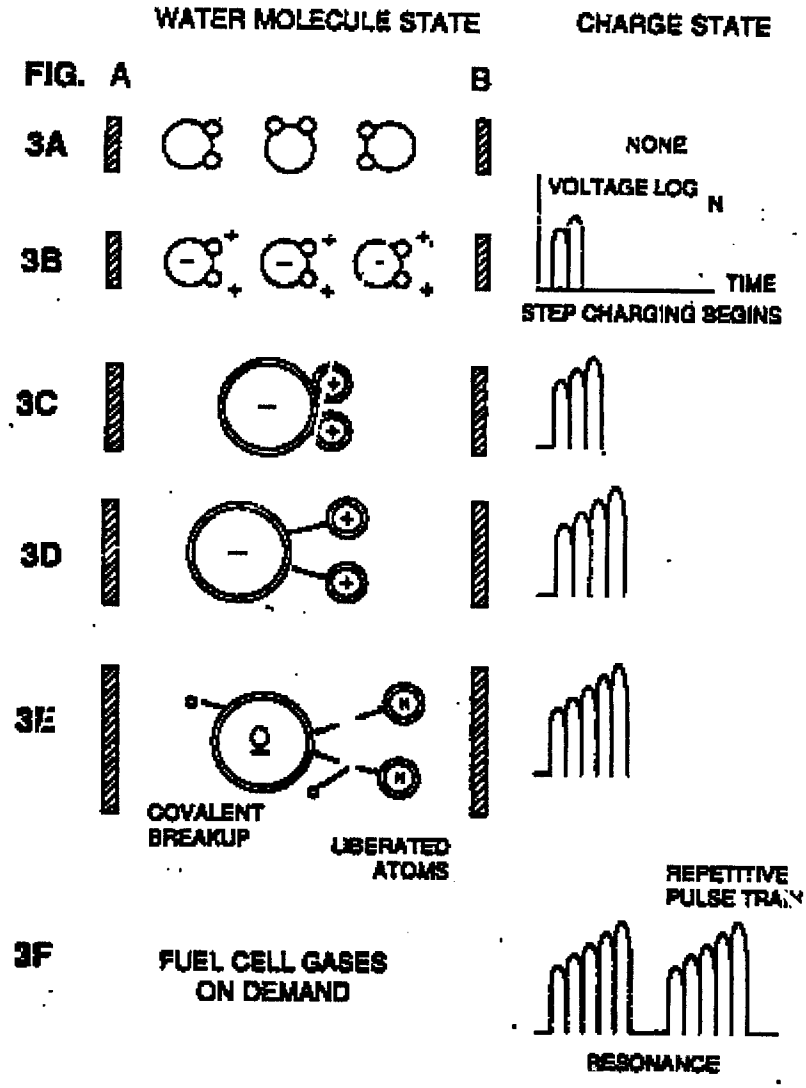


FIGURE 1





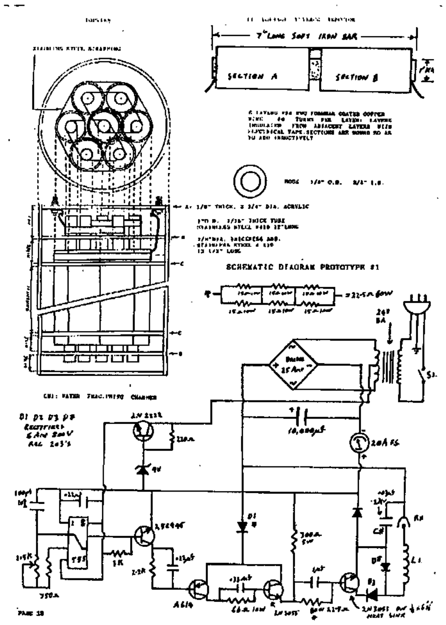
There are two primary frequencies that produce the best results. They are. 14372 Hz and 43430 Hz. The former is about 50% more efficient, but it seems that just about any frequency between 9 KHz and 143762 KHz works quite well. 1) This is because the nature of the wave form (a spike) is rich in harmonics and one of them is bound to be close to one of the two primary frequencies.

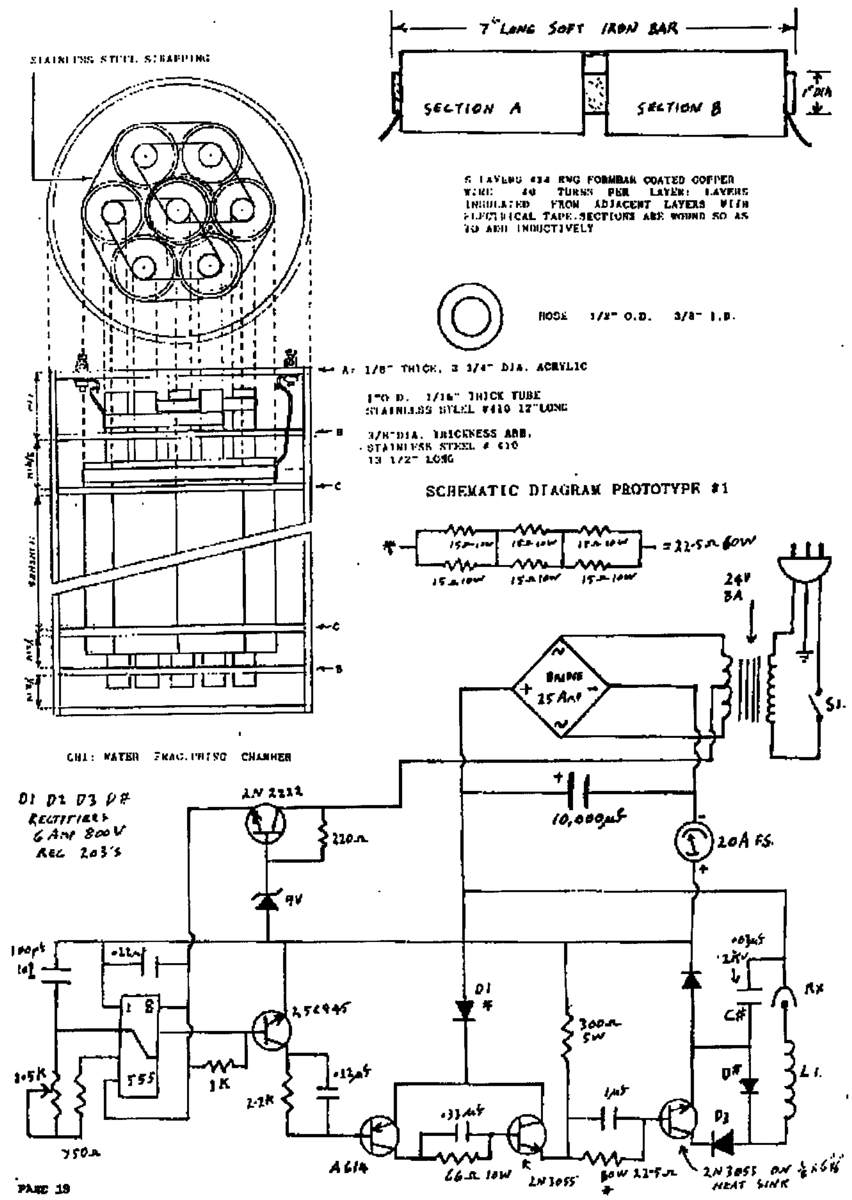
Use of permanent magnets may also increase efficiency. I'll give you the outcome of that attempt in my next letter along with the plans for what I hope to be a much improved version.

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

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

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

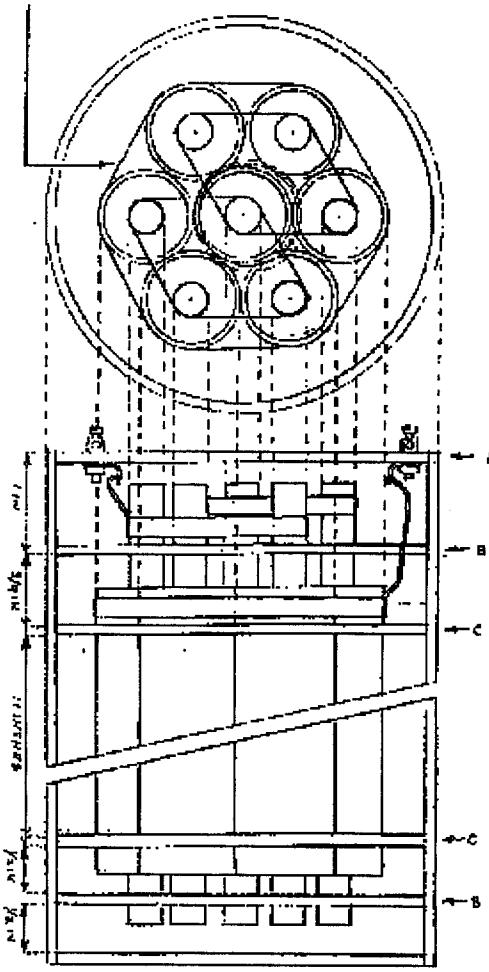




7" LONG SOFT IRON BAR
SECTION A
SECTION B
1" DIA
STAINLESS STEEL STRAPPING
5 LAYERS #34 RWG FORMBAR COATED COPPER WIRE 40 TURNS PER LAYER: LAYERS INSULATED FROM ADJACENT LAYERS WITH ELECTRICAL TAPE. SECTIONS ARE WOUND SO AS TO ADD INDUCTIVELY
HOSE 1/2" O.D. 3/8" I.D.
A: 1/8" THICK, 3 3/4" DIA. ACRYLIC
1" O.D. 1/16" THICK TUBE STAINLESS STEEL #410 12" LONG
3/8" DIA. THICKNESS ADD. STAINLESS STEEL # 410 13 1/2" LONG
CH1: WATER FRACTURING CHAMBER
SCHEMATIC DIAGRAM PROTOTYPE #1
= 22.5Ω 60W
15Ω 10W
24V 8A
S1
BRIDGE 25 AMP
10,000μF
20A FS.
D1 D2 D3 D4 RECTIFIERS 6 AMP 800V REC 203's
2N 2222
220Ω
9V
100μF
.01μF
555
1K
2N 2945
2.2K
.15μF
750Ω
A614
.33μF
66Ω 10W
2N3055
300Ω 5W
1μF
60W 22.5Ω
D3
2N3055 ON 1/4 x 6 x 6 HEAT SINK
.003μF 2KV
RX
L1

TOP VIEW

STAINLESS STEEL SCRAPPING

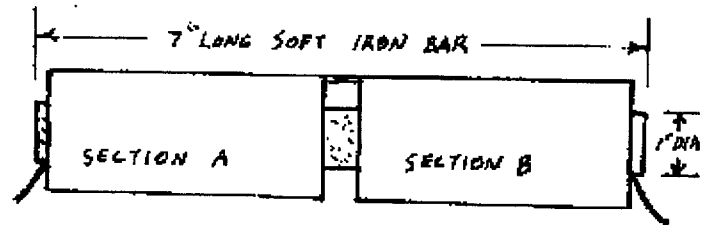


A: 1/8" THICK, 3 3/4" DIA. ACRYLIC

1"O.D. 1/16" THICK TUBE
STAINLESS STEEL #410 12"LONG

3/8"DIA. THICKNESS ARB.
STAINLESS STEEL # 410
13 1/2" LONG

CH1: WATER FRACTURING CHAMBER



5 LAYERS #24 ENG FORMVAR COATED COPPER WIRE 40 TURNS PER LAYER: LAYERS INSULATED FROM ADJACENT LAYERS WITH ELECTRICAL TAPE. SECTIONS ARE WOUND SO AS TO ADD INDUCTIVELY

HOSE 1/2" O.D. 3/8" I.D.

SCHEMATIC DIAGRAM PROTOTYPE #1