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### BACKGROUND OF THE INVENTION

The scientific community has long realized that water is an enormous natural energy resource, indeed an inexhaustible source, since there are over 300 million cubic miles of water on the earth's surface, all of it a potential source of hydrogen for use as fuel. In fact, more than 100 years ago Jules Verne prophesied that water eventually would be employed as a fuel and that the hydrogen and oxygen which constitute it would furnish an inexhaustible source of heat and light.

Water has been split into its constituent elements of hydrogen and oxygen by electrolytic methods, which have been extremely inefficient, by thermochemical extraction processes called thermochemical water-splitting, which have likewise been inefficient and have also been inordinately expensive, and by other processes including some employing solar energy. In addition, artificial chloroplasts imitating the natural process of photosynthesis have been used to separate hydrogen from water utilizing complicated membranes and sophisticated artificial catalysts. However, these artificial chloroplasts have yet to produce hydrogen at an efficient and economical rate.

These and other proposed water splitting techniques are all part of a massive effort by the scientific community to find a plentiful, clean, and inexpensive source of fuel. While none of the methods have yet proved to be commercially feasible, they all share in common the known acceptability of hydrogen gas as a clean fuel, one that can be transmitted easily and economically over long distances and one which when burned forms water.

### SUMMARY OF THE PRESENT INVENTION

In classical quantum physical chemistry, the water molecule has two basic bond angles, one angle being  $104^\circ$ , and the other angle being  $109^\circ 28'$ .

The present invention involves a method by which a water molecule can be energized by electrical means so as to shift the bond angle from the  $104^\circ$  configuration to the  $109^\circ 28'$  tetrahedral geometrical configuration.

An electrical function generator (Component 1) is used to produce complex electrical wave form frequencies which are applied to, and match the complex resonant frequencies of the tetrahedral geometrical form of water.

It is this complex electrical wave form applied to water which is contained in a special thermodynamic device (Component II) which shatters the water molecule by resonance into its component molecules—hydrogen and oxygen.

The hydrogen, in gas form, may then be used as fuel; and oxygen, in gas form is used as oxidant. For example, the thermodynamic device of the present invention may be used as a hydrogen fuel source for any existing heat engine—such as, internal combustion engines of all types, turbines, fuel cell, space heaters, water heaters, heat exchange systems, and other such devices. It can also be used for the de-salinization of sea water, and other water purification purposes. It can also be applied to the development of new closed cycle heat engines where water goes in as fuel, and water comes out as a clean exhaust.

For a more complete understanding of the present invention and for a greater appreciation of its attendant advantages, reference should be made to the following detailed description taken in conjunction with the accompanying drawings.

### DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic block diagram illustrating the electrical function generator, Component I, employed in the practice of the present invention;

FIG. 2 is a schematic illustration of the apparatus of the present invention, including a cross sectional representation of the thermodynamic device, Component II;

FIG. 3 is a cross-sectional view of Component III of the present invention, the water cell section of Component II;

FIG. 4 is an illustration of the hydrogen covalent bond;

FIG. 4A is an illustration of the hydrogen bond angle;

FIG. 4B is an illustration of hybridized and un-hybridized orbitals;

FIG. 4C is an illustration of the geometry of methane ammonia and water molecules;

FIG. 5 is an illustration of an amplitude modulated carrier wave;

FIG. 6 is an illustration of a ripple square wave;

FIG. 6 A is an illustration of uni-polar pulses;

FIG. 7 is a diagram showing ion distribution at the negative electrode;

FIG. 8 is an illustration of tetrahedral bonding orbitals;

FIG. 9 is an illustration of water molecules;

FIG. 10 is an illustration of productive and non-productive collisions of hydrogen with iodine;

FIG. 11 is a wave form found to be the prime characteristic for optimum efficiency;

FIG. 12 is an illustration of pearl chain formation;

FIG. 13 is a plot of the course of the onset of the barrier effect and the unblocking of the barrier effect; and

FIGS. 14A, B, and C are energy diagrams for exergonic reactions.

### DETAILED DESCRIPTION OF INVENTION

#### Section 1—Apparatus of Invention

The apparatus of the invention consists of three components, the electrical function generator, the thermodynamic device, and the water cell.

#### COMPONENT I. The Electrical Function Generator

This device has an output consisting of an audio frequency (range 20 to 200 Hz) amplitude modulation of a carrier wave (range 200 Hz to 100,000 Hz). The impedance of this output signal is continuously being matched to the load which is the second component, the thermodynamic device.

The electrical function generator represents a novel application of circuitry disclosed in my earlier U.S. Pat. Nos. 3,629,521; 3,563,246; and 3,726,762, which are incorporated by reference herein. See FIG. 1 for the block diagram of Component I.

#### COMPONENT II. The Thermodynamic Device

The thermodynamic device is fabricated of metals and ceramic in the geometric form of coaxial cylinder made up of a centered hollow tubular electrode which is surrounded by a larger tubular steel cylinder, said two















