Hydrogen generator system

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Inventor: MEYER STANLEY A
Applicant: MEYER STANLEY A
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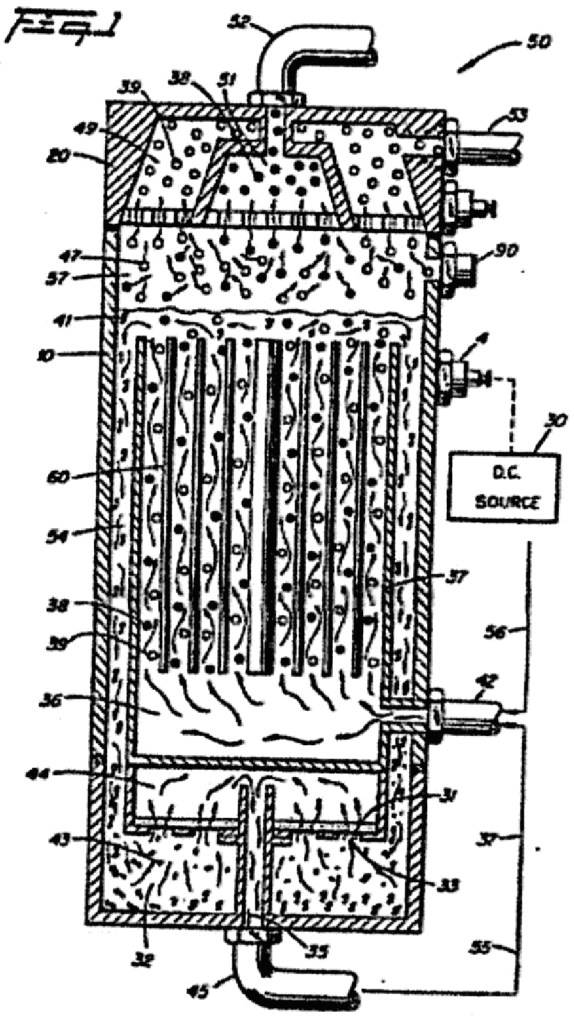
Application number: EP19820111594 19821214
Priority number(s): EP19820111594 19821214

Cited documents:
DE2852712
JP54089978

Abstract of **EP0111573**

Process and apparatus for dissociating the hydrogen atoms of a water molecule by electrical force. Particularly, the separation of the hydrogen and oxygen atoms from the water molecule by the application of a non-regulated, non-filtered, low-power, direct current voltage electrical potential (30) applied to two non-oxidizing similar metal plates (60) having water passing therebetween. The direct current voltage may be continuous, but the sub-atomic action is enchanced by pulsing the non-regulated and non-filtered direct current voltage. The apparatus comprises constructional configurations and there is disclosed alternative embodiments for segregating the generated hydrogen gas from the oxygen gas. The water need not be pure and may contain contaminents. The release of the hydrogen (38) and oxygen (39) atoms causes the contaminents (41, 54, 32) to fall away, thereby enabling the system to be utilized in a liquid slurry removal system. Alternatively, the recombining of the hydrogen and oxygen would give pure water.



Hydrogen generator system

Description of **EP0111573**

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direct current voltage electrical potential applied to two nonoxidizing similar metal plates having water passing therebetween.

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BACKGROUND
The potential availability of hydrogen as a supplement to and eventually completely replace the present day available fuels is most appreciated. The efficiency of hydrogen as a fuel and its pollution free qualifies further enchances its attractive ness.

The prior art systems have been successful in splitting the hydrogen atoms from the oxygen. However, costs perBcu is most prohibitive and completely restricts the known process from commercialization.

The most commonly understood method of separating the hydrogen and oxygen atoms from water is electrolysis. This comprises placing a direct current voltage in asdlution of water and potasium hydroxide, When current flows, an exchange of ions and electrons occurs between the electrodes. Hydrogen atoms collect at the negative electrode (cathode) and oxygen atoms at the positive electrode (anode). A separation between the electrodes separates the gases.

Significantly this Significantly this process requires a chemical solution; that is, it does not process the hydrogen from pure water.

Furthermore, the cost per million Btu is in the order of three times the cost of gasoline.

Other electrolysis processes have been devised and disclosed; but, again the more sophisticated, the complicated, complex and costly with the attendant unreliability.

Another process under study comprises nuclear energy to supply heat in a thermal of the hydrogen dissociation. The problems with the process include the lack of container
EMI3.1
materials that can withstand temperatures of(3,700 degreesF and a practical method of attaining such temperatures. The addition of inorganic compounds to the water permitslowr temperatures but again, adds to the complexity of the process.

A commercial method known as the Bosch process, consists in passing steam over highly heated carbon in the presence of a suitable catalyst. Carbon monoxide,CO, and hydrogen are first formed as shown in the following equation:
H20 + C --C'O + H2
The resulting carbon monoxide then reacts with more steam, forming carbon dioxide and hydrogen:
CO + H20 --CO2 + H2
The carbon dioxide is separated from the hydrogen by passing the mixture through water under pressure;

the carbon dioxide dissolves in the water and leaves the hydrogen pure or nearly so.

Another process consi-sts in the action of steam on methane,CR4. The equations for the reactions that take place are:
CH4 + H20 -- CO + 3H2
CO + H20 -- C02 + H2
The resulting carbon dioxide and hydrogen are separated as in
Bosch process. In a similar way, hydrogen may be obtained from other hydrocarbons.

Hydrogen is also obtained as a by-product from processes designed to prepare other substances, for example,inthe preparation of chlorine by electrolysis of sodium chloride solution:
2 (Na + (aq),C1 - (aq)) + 2H20 -- 2(Na+(aq), OH- (aq)) +
H2 +C12 and other important processes. The symbol (aq) tells us that the substances are present in water (aaueos) solutions.

Finally, there is the nature way of attaining hydrogen by photosynthesis. At best the process is still in the laboratory small-scale stage and those in the art acknowledges the process can produce hydrogen with an efficiency of only 37%.

It is generally understood among scientists that all forms of hydrogen production must be explored -- even if it is too costly, inefficient, or impractical. But, more significantly, hydrogen will be the fuel of the future. The only question remains how and when it will be produced.

Reference is made to the publication Cheaper Hvdrogen.

Popular Science, September 1981, pages 10 through 14, that reviews and updates the above-noted processes for disassociating the hydrogen atom.

SUMMARY OF7NVENTZON
The process of the present invention, unlike those of the prior art, is a simple, efficient, and low cost process for separating the hydrogen and oxygen atoms from water. No chemicals are added to the water and the electrical power utilized is only negligible.

In its most fundamental concept the water-(may be pure, salt water,contaminated 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
EMI5.1
a very low direct\ current power source. The hydrogen atoms are separated and collected for utilization.

The contaminants in the water is forced also to dissociate 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 isnon-regulated andnon-filtered.
EMI5.2

Experimentation demonstrated that the directcurrenttactS as I static force on the water molecules; whereas therippling direct *
EMI5.3
current acts as a dynamic torce. Pulsating the direct current further acts as a dynamic force and enhances considerably the splitting of the atoms from the water molecules.

The apparatus for carrying out the process is extremely simple and can be manufactured most inexpensively. Certain plate arrangements and configurations are disclosed with graphical illustration of relative efficiency. Alternative structure for separating and collecting the hydrogen from the oxygen is disclosed.

OBJECTS
It is accordingly a principal object of the present invention to provide method and means for ahvdrogen/oxvnen
EMI6.1
generator that is operablefrom anyfwater source irrespective of its purity.

Another object of the present invention is to provide such a hydrogen/oxygen generator that is operable

from every low electrical power, extremely efficient, and wherein the cost of operation ia most minimal.

Another object'of the present invention is to provide a hydrogen/oxygen generator from water containing contaminents, and thereafter recombining thehydrogenloxygen to form pure water.

Still another object of the present invention is to provide ahydrogen/oxygen generator that utilized apparatus ofsimple and low cost materials, and which structure can by made in varying sizes, and duplicated without loss of efficiency.

Other objects and features of the present invention will become apparent from a reading of the detailed description of the preferred embodiment and it-s alternative structures when taken in conjunction with the drawings in which

BRIEFDESCP.IPTION OF DRAWINGS

Figure 1 is an illustration in cross-section of the operable constructed preferred embodiment of the present invention.

Figure 2 illustrates the coaxial cluster or array of plates utilized in the embodiment of Figure 1.

Figure 3 is a first alternative plate arrangement, a concentric coaxial array.

Figure 4 is another alternative plate arrangement, the flat plate array.

Figure 5 illustrates the voltage potential as applied to several plates.

Figure 6 illustrates the principles of the present invention in its most simplified embodiment.

Figure 7 is theppreferred embodiment shown inFigure 1 except in this illustration, the view is perspective.

Figure 8 is a graphical illustration of applied power versus gas generated, and effectas . condition of water.

Figure 9 is a graphical illustration of applied powerversos gas generated, and increases in water temperatures,

Figure 10 is a graphical illustration of gas generator versus tube length in a tubular plate arrangement. I

Figure 11 is a graphical illustration of applied. power versus gas generated for pure water.

Figure 12 is a graphical illustration of gas generation for three different geometrical configurations of plate structure.

Figure 13 is a graphical illustration of gas generatedwitn the plates having increasing separation, and

Figure 14 is a graphical illustration of electrical costs versus gas generated, and increases in Exciter Plate 5.

Figure 15 is a graphical illustration ofdifferent-applied power versus gas generated, for various types of water conditions.

Figure 16 is a gas generated versus pulse direct currentrepi'ition rate. -

DETAILEDDESCRIPT70N'OF INVENTION AS DEPICTED IN DRAWINGS

With particular reference now tofigure 5 , there is illustrated schematically in cross-section the invention in its most simplified embodiment.

A structure 110 contains a water supply 15 comprising molecules 62a xxx 62n, of hydrogen 38a xxx 38n, oxygen, 39a xxx 39n, and foreign substances 64a xxx 64n. A pair of plates 9a and 9n consisting of non-oxydizing metal -- and bothof-the same metal, are submerged in the water 15.

Attached to terminal 32 on the first of the plates 9a is a wire having its other end connected to the negative terminal there is connected another wire having its other end connected

EMI9.1

to the positive terminal of the aforesaid directcurrent;elec- trical source 30.

The direct current voltage applied to the water passing between plates 9a and 9b is sufficient to dissociate the hydrogen atom 39a x x x 39n and oxygen atoms 38a x x x 39n (appearing as bubbles) from the water molecules 62a xxx 62n. Theforce ful action of the applied potential attacks the molecule structure of the water and not its atomic structure, i.e., sub-atomic.

The foreign substance or contaminents 64a xxx 64n is broken away from the water molecule 62a xxx 62n, and spills over the outside area of the plates 9a and 9b to a collector at the bottom of the tank 110.

The hydrogen gas 63a xxx 63n and oxygen gas 65a xxx 65n rises above the liquid. The gasses are separated,collected and thereafter utilized all as set forth below.

The process shown with the apparatus of Figure6 is operable, as depicted schematically, in its most crude form.

To increase and enchance the action, the process and the apparatus is improved upon as shown in the constructed and preferred embodiment of Figure 1 in cross-section and Figure 10 in perspective.

The voltage source 30 (shown schematically in Figure 5) supplies a direct current voltage that is rectified bur-not filtered and not regulated. That is, the direct current voltage is rippled and unregulated. The varying amplitude peeks, ripples, in terms of applied'force acts as a constant static physical force.

The amount of electrical power required by the hydrogen/ oxygen generator of the preferred embodiment, as illustrated, is surprisingly minimal. For the embodiment shown in Figures 2 and 10, the source 30 supplied 12 volts at 1 ampere to terminal 4.

It can be appreciated, that increasing the voltage would enhance the forceful sub-atomic action upon the water molecule.

With reference to Figure 11, the voltage current versus gas generated is illustrated graphically. The gas generated is a linear function to magnitude of voltage applied. However, there is a serious limitation to increasing the voltage. As the voltagel current is increased the temperature of the water increases and eventually reaches a condition where steam is generated -- as illustrated graphically in Figure 10 Further as'showngraphi- cally in Figure 9 the current versus gas generated is also a function of the type of water utilized.

Therefore, in lieu of increasing the electrical power to enchance the sub-atomic action on the water molecules, other conditions have been considered. The first is to alter the plate source direct current. voltage waveform.

With particular reference to Figure 5 there is illustrated an electronic switch for switching on and off the rippledd.c output of supply 30. The ripple is not removed.

The plates 32a x x x 32n are connectedto a common ground 34.

The positive terminals 33a x x x 33n are connected respectively to contacts 31a x x x 31n of switch 35 rotatively making and breaking contact with the direct-current voltage source 30.

In function the pulsed rippled output voltage forcefully applies to the water molecules a dynamic force, the pulse repitition rate versus the gas generated.

Other structured factors altering, affecting, and particularly enhancing the hydrogen gas generating comprises altering (1) plate size, (2) plate spacing, (3) number of plates, and (4) the plate configuration. Each of these factors have been taken into consideration in the development of a plate configuration to provide optimum results for apreferred embodiment.

With reference to Figure 2, there is shown an array or cluster of tubular plates utilized in the preferred embodiment of Figures 1 and 7 The term "plate" hereinafter, is intended to convey a large area electrical surface; and whether the surface is flat, curved, tubular or otherwise, is of no consequence except as hereinafter defined. Particularly each tubular plate comprises an outside tube 32a x x x 32n, and an inside tube 33a x x x 33n. Connecting each of the center tubes 33a x x x 33n is a terminalwire34; and connecting each of the outside tubes the through a common ground is a terminal wire-36. The two terminal wire 34 and36'are connected to the positive and negative side respectively of the direct current voltage source 30. Intermediate the outside and inside tubes are a series of spacers 35a x x x 35n.The coaxial tubes in an array are shown pictorially in the perspective view of Figure7
With particular reference to Figure 3 there is illustrated, as an alternative to that utilized in the preferred embodiment, another plate arrangement and configuration. This concentric ring array comprises a series of tubes each being co-axial with the other and of a size equally larger than its inner adjacent tube. The

center tube 38a and the alternate tubes 38b and 38c serve as the positive plates connected to positive wire terminal 36. Each of the tubular plateS 38a, 38b, and 38c are interconnected via connectors 8a and 8d to wire terminal 34.The three spacers.39a, 39b, and 39c maintain a uniform spacing between the respective tubular plates.

With particular reference to Figure 4 there is shown still another plate arrangement and configuration. In this embodiment, shown in cross-section, the positive plates 9a x x x 9n are interconnected by electrode 12a whereasthe negative plateslia x x xlin are interconnected by the elect'rode 12b.

With particular reference to 12 there is illustrated graphically the efficiency of the tubular plate array of Figure 2, the cluster tubular array of Figure 3, and the flat plate array of Figure 4. Specifically there is shown the gas generation versus the plate configuration. It can be appreciated from this graph why the embodiment of Figure 1 includes the cluster tubular array of Figure 2.

As stated above another factor affecting the gas generation output is the plate separation. With particular reference to Figure 13 there is illustrated graphically plate spacing versus gas generation. As can be seen the greater the spacing the less gas generation. The efficiency versus spacing of the plates is a linear decrease with spacing.

As stated above the applied direct current voltage across the positive current voltage plates having water therebetween is a force applied -- in the nature of a physical force -- to the water molecules. The applied force is sufficient-to cause the hydrogen and oxygen atoms to dissociate themselves from the water molecule and anything else that may be included therewith.

In the aforementioned prior art system of hydrogen gas generation such as the electrolysis process., it is essential that the water be distilled or otherwise made pure.

To determine the relative. differences of the amount of gas generated versus the purity of the water, analysis was maåe of distilled water, rain water, city tap water, river water, well water untreated, well water treated, and sea water. The results of gas generation versus electrical power is illustrated in Figures-8andl5 graphically for each of the waters tested.

It appears that water containing contaminents aids gas generation; however, the nature of the water contaminents appears to have no significance. The hydrogen atoms and oxygen atoms dissociate themselves from the water molecule. - Anything else that may be included in the water is also bombarded loose and overflows the tank 37 and falls to the bottom 43.

Having now examined the applied electrical force phenomena, the physical configuration of the electrical plates, the power applied, and the condition of the water, reference is made specificially to the constructed function and operation constructed and operable preferred embodiment of the hydrogen gas generator of the present invention shown in cross-section in
Figure 1 and in perspective in Figure7.

-The container 10 is a square elongated box configuration completely enclosing and sealing the components as hereinafter described.

Water, from which the hydrogen gas is to be taken, enters via inlet 42 to the chamber 36. The water is pumped or enters under normal pressure from a source via line 56. As mentioned above, the water need not be pure and hence may originate froman'; source. The water from source 42 enters chamber 36 which is a free area to an open top enclosure 37.

The water entering chamber 36 is caused to rise upwardly through the plates of theCluster, 60 previously described in more detail relative to Figure 2.

Applied to the inner tubular structures is a positive direct current voltage, and to the outer tubular structures of the cluster array 60 is applied a negative direct current voltage. The direct current voltage is applied via terminals
EMI16.1
4 connected to a suitable directcurreng/pwer source 30.

The hydrogen gas is depicted in Figure 1 as a solidcirclel,7whereas the oxygen gas is depicted as the open circles 39.

The separated hydrogen and oxygen gas rises into the accumulator chamber 47.

Not all of the water molecules is broken up into its various atomic components. Thus, the unspent water 41 spills over the top of chamber 37 and drops down through outer chamber 54 and back to reservoir 43.

As aforesaid, it is not necessary to utilize pure water, the intake water will include several forms of contaminents. As test understood, when the water molecule is bombarded with the dynamic and static electrical force, the contaminents adhering to the water molecules are shaken loose and released therefrom.

The contaminents, too, rise to the top of chamber 37 and form a part of the spillway 41. In that the containments do not contain hydrogen or oxygen, there will be no atomic breakup. The combination of water with contaminents drops down into ex traction chamber 43.

In the extraction chamber 43 most of the sediment orsludge will drop to the bottom of the chamber 32. The water with most of the sediment removed passes through the ports 33a xxx 33n, through charcoal filter 31, and into return water chamber 44. The uppermost portion of the water in chamber 44 drops into standpipe 35.

The water cleansed of substantially all contaminents exits via pipe 45 and then through line 55 and back to inlet pipe 42. The combined water from inlets 55 and 56 is again processed as aforesaid.

Hydrogen generator system

Claims of **EP0111573**

?anent Claims:

1.k system for the non-ionic release of hydrogen gas andoxygen gas from natural water, characterized by2 non oxydizing housing having a reservoir for retaining natural non-electrolytic water therein, a pair of similar non-oxydizing plates positioned in said water, a direct voltage/current source includingmeans forconnec- tirz one of said plates to the negative terminal and the other of said plates to the positive terminal of said source, said direct voltage/current potential on said plates causes a sub-atomic force-type action on said water1 thereby disassociating the hydrogen atoms and oxygen atoms from the water molecules.

2. The systen as set forth in claim 1, characterised in that said voltage/current potential is an unfiltered and non-regulated voltage and/or is pulsed.

3. The system as set forth in claim 2, characterized in that said pulsed direct voltage/current potential includes means to control the repetition rate thereof.

; The system as set forth in claim 1, characterized in that said direct voltage/current potential includes means for varying the amplitude of said potential.

5. The system as set forth in claim 1, characterised in that said natural water contains contaminents and that saidcontaminera;ts are releasedby' said sub-at-omic force on the water molecules, and means for collecting said contaminents.

6. The system as set forth in claim 1,charaterized in that said non-oxydizing plates have a flat or alternatively a nonplanar surface.

?. The system asset forth in claim 1, characterized in that'said non-oxydizing plates are coaxial or alternatively have a con centric surface.

8.The system as set forth in claim 1, characterized in that said non-oxydizing plates are a plurality of plates in an array.

9. The system as set forth inclaim 1, characterized in-that said non-oxydizing plates are a cluster of coaxial plates in an array.

10. The system as set forth in claim 1, characterized in that said positive and negative non-oxydizingplates are varied in spacing and/or in length and/or in surface area.

11. The system as set forth in claim 1, characterized in that said non-oxydizing housing further comprises a gas collection chamber for maintaining a preset volume of gas under pressure.

12. The system as set forth in claim 1, characterized in that theconfiguratinn of said plates is directly related to the forceful action of said direct current voltage potential onsaid water molecules.

I.

13. The system as set forth in claim 8, characterized by switching means interconnected to each of said plates in said array and to.said voltage source for switching in and out selected ones of said array of plates from said voltage source.

14. The process ofnon-ionic releasing hydrogen andoxygen gas

from non-electrolytic water, characterized by
passing said non-electrolytic water through a contained area
having a pair of non-oxydizing electrically conductive plates
therein,
applying a direct current electric positive potential across
one of said plates and applying a direct current electric
negative potential across the other of said plates, said electrical power potential applied to said plates
being of sufficient magnitude to cause the positiveatoms of the water molecule to be attracted to the
negative potential on said plate and thenegative atoms of the water molecule to be attracted to the positive
potentialon said plate, thereby forcing the hydrogen atoms and the oxygen atoms to disassociate
themselves from the water molecule.

Hydrogen generator system

Legal status (INPADOC) of **EP0111573** (A1) ?

EP F	**82111594 A**	(Patent of invention)
PRS Date :	1984/06/27	
PRS Code :	AK	
Code Expl.:	+ DESIGNATED CONTRACTING STATES:	
DESIGNATED COUNTR.:	AT BE CH DE FR GB IT LI LU NL SE	
PRS Date :	1985/02/20	
PRS Code :	17P	
Code Expl.:	+ REQUEST FOR EXAMINATION FILED	
EFFECTIVE DATE:	19841207	
PRS Date :	1992/08/19	
PRS Code :	18R	
Code Expl.:	- REFUSED	
EFFECTIVE DATE:	19920320	

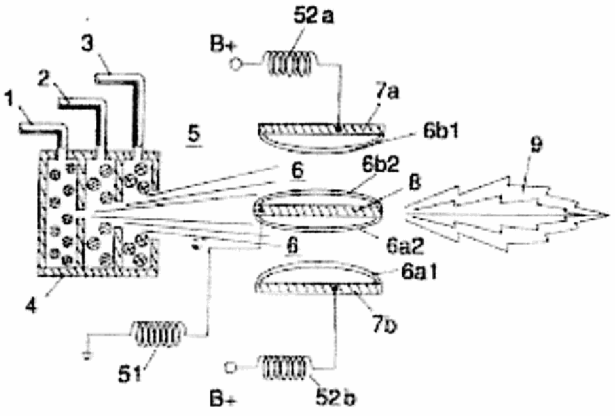
WATER FUEL INJECTION SYSTEM

Patent number: WO9222679
Publication date: 1992-12-23
Inventor: MEYER STANLEY A (US)
Applicant: MEYER STANLEY A (US)
Classification:
- international: C25B1/02; F02B51/00; F02M27/00
- european: B01J19/08D; C01B3/04B; F02B47/02
Application number: WO1991US03476 19910612
Priority number(s): CA19912067735 19910517; WO1991US03476 19910612; AU19910084471 19910612

Cited documents:
US4185593
US5010869
US3648668
US3946711
US4023545
more >>

Abstract of **WO9222679**

An injector system comprising an improved method and apparatus useful in the production of a hydrogen containing fuel gas from water in a process in which the dielectric property of water and/or a mixture of water and other components determines a resonant condition that produces a breakdown of the atomic bonding of atoms in the water molecule. The injector delivers a mixture of water mist (1), ionized gases (2), and non-combustible gas (3) to a zone or locus (5) within which the breakdown process leading to the release of elemental hydrogen from the water molecules occurs.



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US4185593
US5010869
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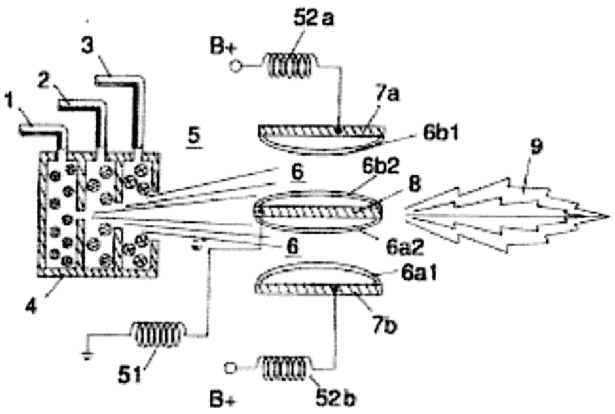
US3946711
US4023545
US4052139
US4613304
US4797186
US4826581
US4936961
less <<

Abstract of **WO9222679**

An injector system comprising an improved method and apparatus useful in the production of a hydrogen containing fuel gas from water in a process in which the dielectric property of water and/or a mixture of water and other components determines a resonant condition that produces a breakdown of the atomic bonding of atoms in the water molecule. The injector delivers a mixture of water mist (1), ionized gases (2), and non-combustible gas (3) to a zone or locus (5) within which the breakdown process leading to the release of elemental hydrogen from the water molecules occurs.



Family list
4 family members for:
WO9222679
Derived from 4 applications.

Back to WO9222679

1 **WATER FUEL INJECTION SYSTEM**
Publication info: **AU8447191 A** - 1993-01-12

2 **WATER FUEL INJECTION SYSTEM**
Publication info: **CA2067735 A1** - 1992-11-18

3 **WATER FUEL INJECTION SYSTEM**
Publication info: **JP7505186T T** - 1995-06-08

4 **WATER FUEL INJECTION SYSTEM**
Publication info: **WO9222679 A1** - 1992-12-23

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WATER FUEL INJECTION SYSTEM

Patent number: AU8447191
Publication date: 1993-01-12
Inventor:
Applicant:
Classification:
- international: C25B1/02; F02B51/00; F02M27/00
- european: B01J19/08D; C01B3/04B; F02B47/02
Application number: AU19910084471D 19910612
Priority number(s): AU19910084471 19910612; CA19912067735 19910517; WO1991US03476 19910612

Abstract not available for AU8447191
Abstract of correspondent: **CA2067735**

An injector system comprising an improved method and apparatus useful in the production of a hydrogen containing fuel gas from water in a process in which the dielectric property of water and/or a mixture of water and other components determines a resonant condition that produces a breakdown of the atomic bonding of atoms in the water molecule. The injector delivers a mixture of water mist, ionized gases and non-combustible gas to a zone or locus within which the breakdown process leading to the release of elemental hydrogen from the water molecules occurs.

4

Family list
4 family members for:
AU8447191
Derived from 4 applications.

Back to AU8447191

1 **WATER FUEL INJECTION SYSTEM**
Publication info: **AU8447191 A** - 1993-01-12

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Publication info: **WO9222679 A1** - 1992-12-23

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4 family

HYDROGEN GAS FUEL AND MANAGEMENT SYSTEM FOR AN INTERNAL COMBUSTION ENGINE UTILIZING HYDROGEN GAS FUEL

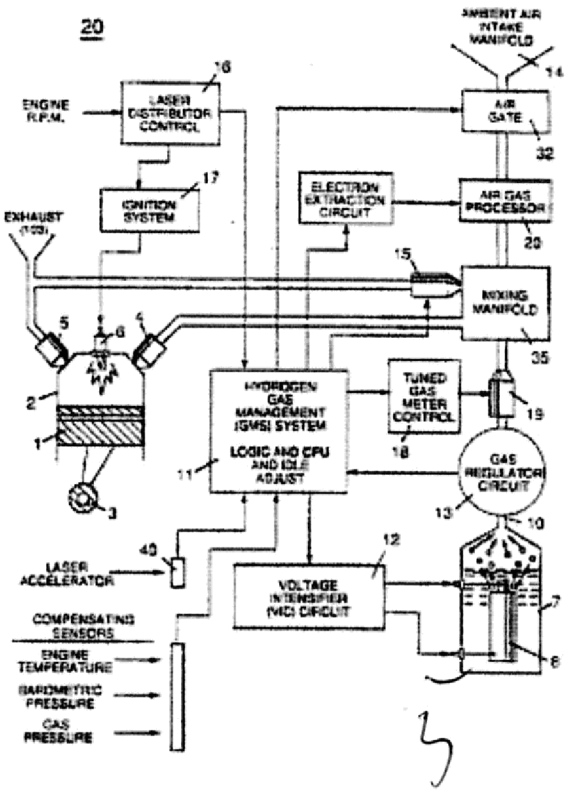
Patent number: WO9208046
Publication date: 1992-05-14
Inventor: MEYER STANLEY A (US)
Applicant: MEYER STANLEY A (US)
Classification:
- international: F02M21/02; F02M25/07; F02M27/00
- european: C01B3/04B; F02B43/10; F02D19/02; F02M21/04; F02M27/04
Application number: WO1990US06513 19901102
Priority number(s): WO1990US06513 19901102

Cited documents:

US3980053
US3844262
US4575383
US4389981
US4031865
US4773981
US3982878
less <<

Abstract of **WO9208046**

A gas fuel for an internal combustion engine (1, 2) comprising a mixture of gases having a proportion of hydrogen to oxygen of approximately 2:1 and a regulated density of the hydrogen component of the mixture such that the burn rate of the mixture approximates that of a fossil fuel and a system (11) for characteristics in an internal combustion engine (1, 2).



HYDROGEN GAS FUEL AND MANAGEMENT SYSTEM FOR AN INTERNAL COMBUSTION ENGINE UTILIZING HYDROGEN GAS FUEL

Patent number: WO9208046
Publication date: 1992-05-14
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Classification:
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Application number: WO1990US06513 19901102
Priority number(s): WO1990US06513 19901102

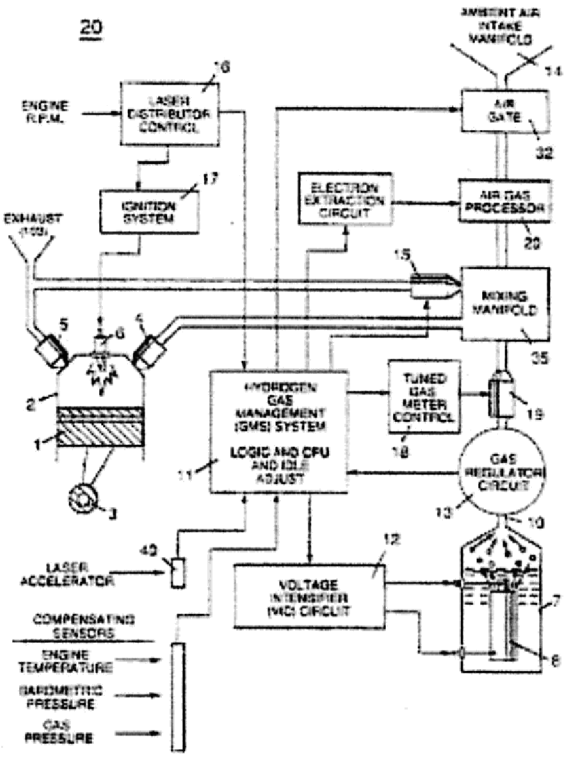
Cited documents:

US3980053
US3844262
US4575383
US4389981
US4031865
more >>

Report a data error here

Abstract of **WO9208046**

A gas fuel for an internal combustion engine (1, 2) comprising a mixture of gases having a proportion of hydrogen to oxygen of approximately 2:1 and a regulated density of the hydrogen component of the mixture such that the burn rate of the mixture approximates that of a fossil fuel and a system (11) for characteristics in an internal combustion engine (1, 2).



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Family list
2 family members for:
WO9208046
Derived from 2 applications.

Back to WO9208046

1 **Hydrogen gas fuel and management system for an internal combustion engine utilizing hydrogen gas fuel**
Publication info: **US5293857 A** - 1994-03-15

2 **HYDROGEN GAS FUEL AND MANAGEMENT SYSTEM FOR AN INTERNAL COMBUSTION ENGINE UTILIZING HYDROGEN GAS FUEL**
Publication info: **WO9208046 A1** - 1992-05-14

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A CONTROL AND DRIVER CIRCUITS FOR A HYDROGEN GAS FUEL PRODUCING CELL

Patent number: WO9207861
Publication date: 1992-05-14
Inventor: MEYER STANLEY A (US)
Applicant: MEYER STANLEY A (US)
Classification:
- international: C07G13/00; H03K3/30
- european: C01B3/04B
Application number: WO1990US06407 19901102
Priority number(s): WO1990US06407 19901102

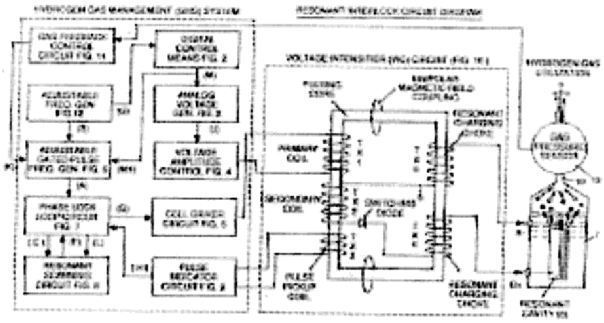
Cited documents:

US4936961
US4275363

Report a data error here

Abstract of **WO9207861**

A control circuit for a capacitive resonant cavity water capacitor cell (7) for the production of a hydrogen containing fuel gas has a resonant scanning circuit cooperating with a resonance detector and PLL circuit to produce pulses. The pulses are fed into the primary (TX1) transformer. The secondary (TX2) transformer is connected to the resonant cavity water capacitor cell (7) via a diode and resonant charging chokes (TX4, TX5).



6

Family list
1 family member for:
WO9207861
Derived from 1 application.

Back to WO9207861

1 **A CONTROL AND DRIVER CIRCUITS FOR A HYDROGEN GAS FUEL PRODUCING CELL**
Publication info: **WO9207861 A1** - 1992-05-14

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6 familles

A CONTROL AND DRIVER CIRCUITS FOR A HYDROGEN GAS FUEL PRODUCING CELL

Patent number:	AU7485291
Publication date:	1992-05-26
Inventor:	MEYER STANLEY A
Applicant:	MEYER STANLEY A
Classification:	
- international:	C07G13/00; H03K3/30
- european:	
Application number:	AU19910074852D 19901102
Priority number(s):	AU19910074852D 19901102

Abstract not available for AU7485291

Family list
1 family member for:
AU7485291
Derived from 1 application.

Back to AU7485291

1 **A CONTROL AND DRIVER CIRCUITS FOR A HYDROGEN GAS FUEL PRODUCING CELL**
Publication info: **AU7485291 A** - 1992-05-26

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family 7

HYDROGEN GAS FUEL AND MANAGEMENT SYSTEM FOR AN INTERNAL COMBUSTION ENGINE UTILIZING HYDROGEN GAS FUEL

Patent number:	AU6887091
Publication date:	1992-05-26
Inventor:	MEYER STANLEY A
Applicant:	MEYER STANLEY A
Classification:	
- international:	F02M21/02; F02M25/07; F02M27/00
- european:	
Application number:	AU19910068870D 19901102
Priority number(s):	AU19910068870D 19901102

Abstract not available for AU6887091

Family list
1 family member for:
AU6887091
Derived from 1 application.

Back to AU6887091

1 **HYDROGEN GAS FUEL AND MANAGEMENT SYSTEM FOR AN INTERNAL COMBUSTION ENGINE UTILIZING HYDROGEN GAS FUEL**
Publication info: **AU6887091 A** - 1992-05-26

Data supplied from the ***esp@cenet*** database - Worldwide

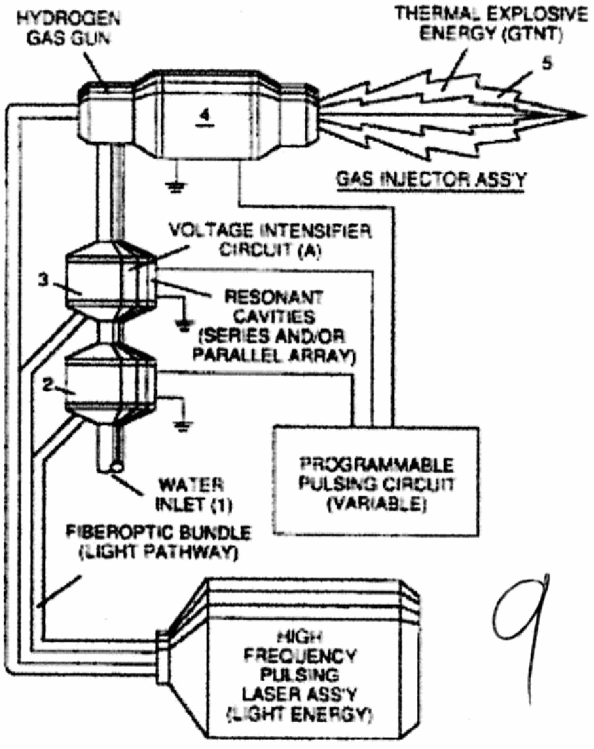
family 8

Process and apparatus for the production of fuel gas and the enhanced release of thermal energy from such gas

Patent number: US5149407
Publication date: 1992-09-22
Inventor: MEYER STANLEY A (US)
Applicant: MEYER STANLEY A (US)
Classification:
- international: C07G13/00
- european: B01J19/08D; B01J19/12; C01B3/04B; F02K11/00
Application number: US19900460859 19900213
Priority number(s): US19900460859 19900213; US19870081859 19870805; US19880207730 19880616

Abstract of **US5149407**

PCT No. PCT/US89/02622 Sec. 371 Date Feb. 13, 1990 Sec. 102(e) Date Feb. 13, 1990 PCT Filed Jun. 15, 1989 PCT Pub. No. WO89/12704 PCT Pub. Date Dec. 28, 1989.Water molecules are broken down into hydrogen and oxygen gas atoms in a capacitive cell by a polarization and resonance process dependent upon the dielectric properties of water and water molecules. The gas atoms are thereafter ionized or otherwise energized and thermally combusted to release a degree of energy greater than that of combustion of the gas in ambient air.



Family list
12 family members for:
US5149407
Derived from 9 applications.

Back to US5149407

1 **PROCESS AND APPARATUS FOR THE PRODUCTION OF FUEL GAS AND THE ENHANCED RELEASE OF THERMAL ENERGY FROM SUCH GAS**
Publication info: **AU3862389 A** - 1990-01-12

2 **CONTROLLED PROCESS FOR THE PRODUCTION OF THERMAL ENERGY FROM GASES AND APPARATUS USEFUL THEREFOR**
Publication info: **EP0333854 A1** - 1989-09-27
EP0333854 A4 - 1989-10-24

3 **PROCESS AND APPARATUS FOR THE PRODUCTION OF FUEL GAS AND THE ENHANCED RELEASE OF THERMAL ENERGY FROM SUCH GAS**
Publication info: **EP0381722 A1** - 1990-08-16
EP0381722 A4 - 1990-12-12

4 **PROCESS AND APPARATUS FOR THE PRODUCTION OF FUEL GAS AND THE ENHANCED RELEASE OF THERMAL ENERGY FROM SUCH GAS**
Publication info: **JP3500042T T** - 1991-01-10

5 **Controlled process for the production of thermal energy from gases and apparatus useful therefore**
Publication info: **US4826581 A** - 1989-05-02

6 **Method for the production of a fuel gas**
Publication info: **US4936961 A** - 1990-06-26

7 **Process and apparatus for the production of fuel gas and the enhanced release of thermal energy from such gas**
Publication info: **US5149407 A** - 1992-09-22

8 **CONTROLLED PROCESS FOR THE PRODUCTION OF THERMAL ENERGY FROM GASES AND APPARATUS USEFUL THEREFOR**
Publication info: **WO8901464 A2** - 1989-02-23
WO8901464 A3 - 1989-03-09

9 **PROCESS AND APPARATUS FOR THE PRODUCTION OF FUEL GAS AND THE ENHANCED RELEASE OF THERMAL ENERGY FROM SUCH GAS**
Publication info: **WO8912704 A1** - 1989-12-28

Data supplied from the ***esp@cenet*** database - Worldwide

PROCESS AND APPARATUS FOR THE PRODUCTION OF FUEL GAS AND THE ENHANCED RELEASE OF THERMAL ENERGY FROM SUCH GAS

Patent number: WO8912704
Publication date: 1989-12-28
Inventor: MEYER STANLEY A (US)
Applicant: MEYER STANLEY A (US)
Classification:
- international: C25B1/04
- european: B01J19/08D; B01J19/12; C01B3/04B
Application number: WO1989US02622 19890615
Priority number(s): US19880207730 19880616

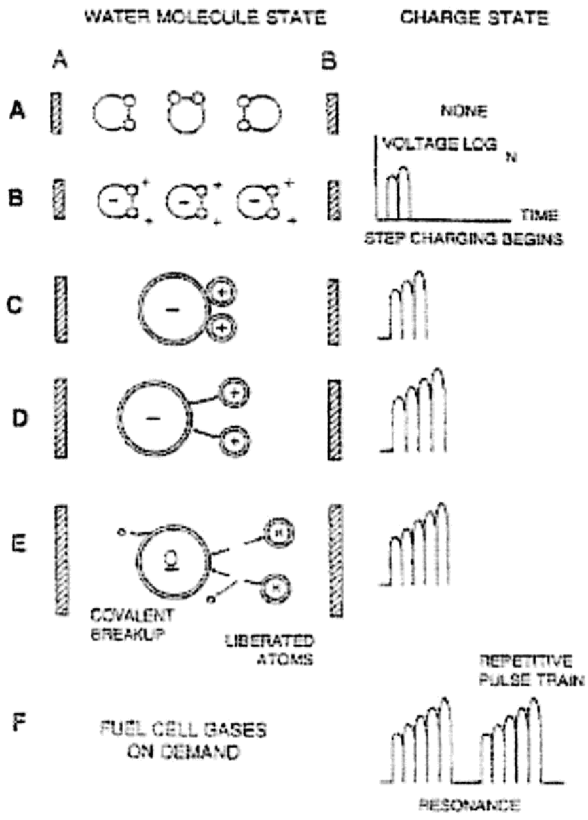
Also published as:
EP0381722 (A1)
EP0381722 (A4)

Cited documents:
US4511450
US4696809
US4740283
US3772180

Report a data error here

Abstract of **WO8912704**

Water molecules are broken down into hydrogen and oxygen gas atoms in a capacitive cell by a polarization and resonance process dependent upon the dielectric properties of water and water molecules. The gas atoms are thereafter ionized or otherwise energized and thermally combusted to release a degree of energy greater than that of combustion of the gas in ambient air.



Data supplied from the ***esp@cenet*** database - Worldwide

Family list
12 family members for:
WO8912704
Derived from 9 applications.

Back to WO8912704

1 **PROCESS AND APPARATUS FOR THE PRODUCTION OF FUEL GAS AND THE ENHANCED RELEASE OF THERMAL ENERGY FROM SUCH GAS**
Publication info: **AU3862389 A** - 1990-01-12

2 **CONTROLLED PROCESS FOR THE PRODUCTION OF THERMAL ENERGY FROM GASES AND APPARATUS USEFUL THEREFOR**
Publication info: **EP0333854 A1** - 1989-09-27
EP0333854 A4 - 1989-10-24

3 **PROCESS AND APPARATUS FOR THE PRODUCTION OF FUEL GAS AND THE ENHANCED RELEASE OF THERMAL ENERGY FROM SUCH GAS**
Publication info: **EP0381722 A1** - 1990-08-16
EP0381722 A4 - 1990-12-12

4 **PROCESS AND APPARATUS FOR THE PRODUCTION OF FUEL GAS AND THE ENHANCED RELEASE OF THERMAL ENERGY FROM SUCH GAS**
Publication info: **JP3500042T T** - 1991-01-10

5 **Controlled process for the production of thermal energy from gases and apparatus useful therefore**
Publication info: **US4826581 A** - 1989-05-02

6 **Method for the production of a fuel gas**
Publication info: **US4936961 A** - 1990-06-26

7 **Process and apparatus for the production of fuel gas and the enhanced release of thermal energy from such gas**
Publication info: **US5149407 A** - 1992-09-22

8 **CONTROLLED PROCESS FOR THE PRODUCTION OF THERMAL ENERGY FROM GASES AND APPARATUS USEFUL THEREFOR**
Publication info: **WO8901464 A2** - 1989-02-23
WO8901464 A3 - 1989-03-09

9 **PROCESS AND APPARATUS FOR THE PRODUCTION OF FUEL GAS AND THE ENHANCED RELEASE OF THERMAL ENERGY FROM SUCH GAS**
Publication info: **WO8912704 A1** - 1989-12-28

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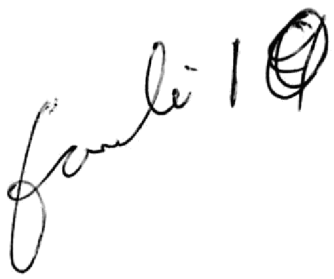


Page 1 si

CONTROLLED PROCESS FOR THE PRODUCTION OF THERMAL ENERGY FROM GASES AND APPARATUS USEFUL THEREFOR

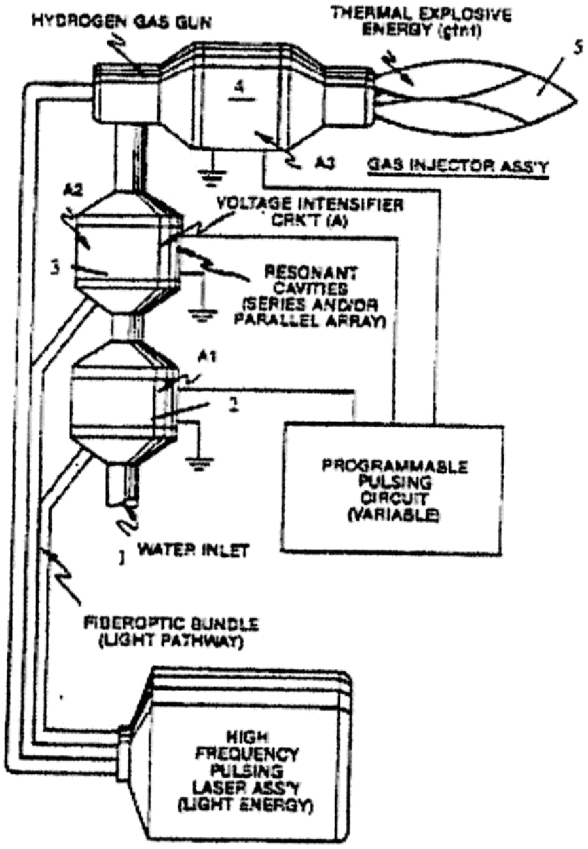
Patent number: WO8901464
Publication date: 1989-02-23
Inventor: MEYER STANLEY A (US)
Applicant: MEYER STANLEY A (US)
Classification:
- international: C07C1/00
- european: F02K11/00
Application number: WO1988US02680 19880804
Priority number(s): US19870081859 19870805

Also published as:
WO8901464 (A3)
EP0333854 (A3)
EP0333854 (A2)
EP0333854 (A4)

Cited documents:
US4233109
US4406765
US4687753
US4695357

Abstract of **WO8901464**

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.



Family list
12 family members for:
WO8901464
Derived from 9 applications.

Back to WO8901464

1 PROCESS AND APPARATUS FOR THE PRODUCTION OF FUEL GAS AND THE ENHANCED RELEASE OF THERMAL ENERGY FROM SUCH GAS
Publication info: **AU3862389 A** - 1990-01-12

2 CONTROLLED PROCESS FOR THE PRODUCTION OF THERMAL ENERGY FROM GASES AND APPARATUS USEFUL THEREFOR
Publication info: **EP0333854 A1** - 1989-09-27
EP0333854 A4 - 1989-10-24

3 PROCESS AND APPARATUS FOR THE PRODUCTION OF FUEL GAS AND THE ENHANCED RELEASE OF THERMAL ENERGY FROM SUCH GAS
Publication info: **EP0381722 A1** - 1990-08-16
EP0381722 A4 - 1990-12-12

4 PROCESS AND APPARATUS FOR THE PRODUCTION OF FUEL GAS AND THE ENHANCED RELEASE OF THERMAL ENERGY FROM SUCH GAS
Publication info: **JP3500042T T** - 1991-01-10

5 Controlled process for the production of thermal energy from gases and apparatus useful therefore
Publication info: **US4826581 A** - 1989-05-02

6 Method for the production of a fuel gas
Publication info: **US4936961 A** - 1990-06-26

7 Process and apparatus for the production of fuel gas and the enhanced release of thermal energy from such gas
Publication info: **US5149407 A** - 1992-09-22

8 CONTROLLED PROCESS FOR THE PRODUCTION OF THERMAL ENERGY FROM GASES AND APPARATUS USEFUL THEREFOR
Publication info: **WO8901464 A2** - 1989-02-23
WO8901464 A3 - 1989-03-09

9 PROCESS AND APPARATUS FOR THE PRODUCTION OF FUEL GAS AND THE ENHANCED RELEASE OF THERMAL ENERGY FROM SUCH GAS
Publication info: **WO8912704 A1** - 1989-12-28

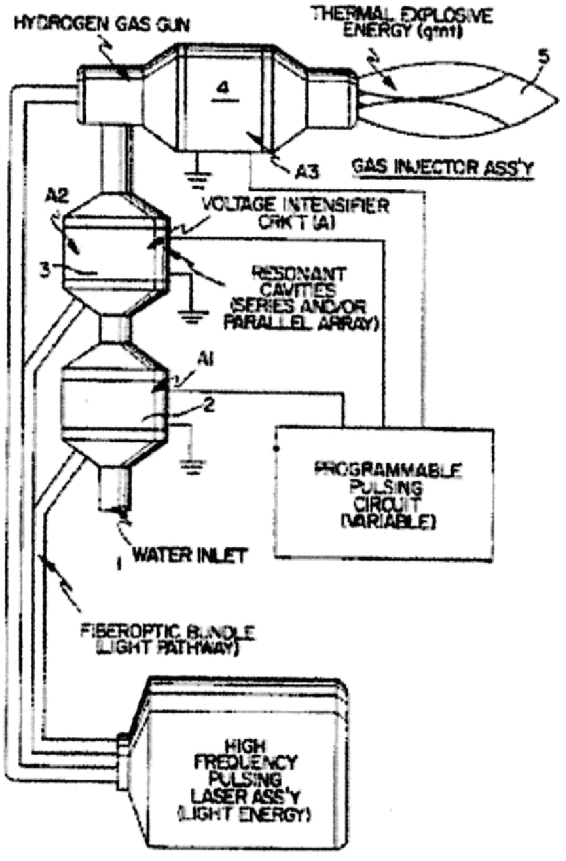
Data supplied from the ***esp@cenet*** database - Worldwide

Controlled process for the production of thermal energy from gases and apparatus useful therefore

Patent number: US4826581
Publication date: 1989-05-02
Inventor: MEYER STANLEY A (US)
Applicant: MEYER STANLEY A (US)
Classification:
- international: C07G13/00
- european: F02K11/00
Application number: US19870081859 19870805
Priority number(s): US19870081859 19870805; US19860835564 19860303

Abstract of **US4826581**

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.



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Family list
12 family members for:
US4826581
Derived from 9 applications.

Back to US4826581

1 PROCESS AND APPARATUS FOR THE PRODUCTION OF FUEL GAS AND THE ENHANCED RELEASE OF THERMAL ENERGY FROM SUCH GAS
Publication info: **AU3862389 A** - 1990-01-12

2 CONTROLLED PROCESS FOR THE PRODUCTION OF THERMAL ENERGY FROM GASES AND APPARATUS USEFUL THEREFOR
Publication info: **EP0333854 A1** - 1989-09-27
EP0333854 A4 - 1989-10-24

3 PROCESS AND APPARATUS FOR THE PRODUCTION OF FUEL GAS AND THE ENHANCED RELEASE OF THERMAL ENERGY FROM SUCH GAS
Publication info: **EP0381722 A1** - 1990-08-16
EP0381722 A4 - 1990-12-12

4 PROCESS AND APPARATUS FOR THE PRODUCTION OF FUEL GAS AND THE ENHANCED RELEASE OF THERMAL ENERGY FROM SUCH GAS
Publication info: **JP3500042T T** - 1991-01-10

5 Controlled process for the production of thermal energy from gases and apparatus useful therefore
Publication info: **US4826581 A** - 1989-05-02

6 Method for the production of a fuel gas
Publication info: **US4936961 A** - 1990-06-26

7 Process and apparatus for the production of fuel gas and the enhanced release of thermal energy from such gas
Publication info: **US5149407 A** - 1992-09-22

8 CONTROLLED PROCESS FOR THE PRODUCTION OF THERMAL ENERGY FROM GASES AND APPARATUS USEFUL THEREFOR
Publication info: **WO8901464 A2** - 1989-02-23
WO8901464 A3 - 1989-03-09

9 PROCESS AND APPARATUS FOR THE PRODUCTION OF FUEL GAS AND THE ENHANCED RELEASE OF THERMAL ENERGY FROM SUCH GAS
Publication info: **WO8912704 A1** - 1989-12-28

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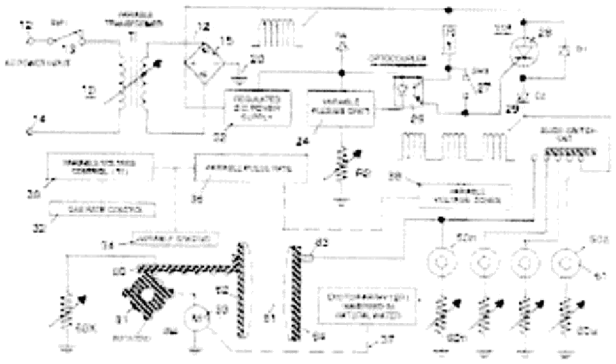
Gamli 13

Gas generator voltage control circuit

Patent number:	US4798661
Publication date:	1989-01-17
Inventor:	MEYER STANLEY A (US)
Applicant:	MEYER STANLEY A (US)
Classification:	
- international:	C25B9/04; C25B15/02
- european:	C01B3/04B; C25B9/04
Application number:	US19850715749 19850325
Priority number(s):	US19850715749 19850325

Abstract of **US4798661**

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 exciters 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 exciters. 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 exciters 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 exciters to individual exciters each having the voltage applied thereto independently of the other plate exciters 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 exciters for a very high yield of gasses, a second electron inhibitor of a unique structure is serially connected with the first electron inhibiter. The second named inhibiter having a relatively fixed value and the first inhibiter connected in series is variable to fine tune the circuits to eliminate current flow.



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Family list
1 family member for:
US4798661
Derived from 1 application.

Back to US4798661

1 **Gas generator voltage control circuit**
Publication info: **US4798661 A** - 1989-01-17

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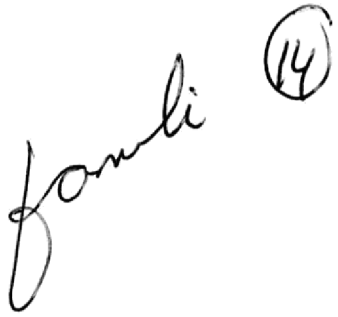
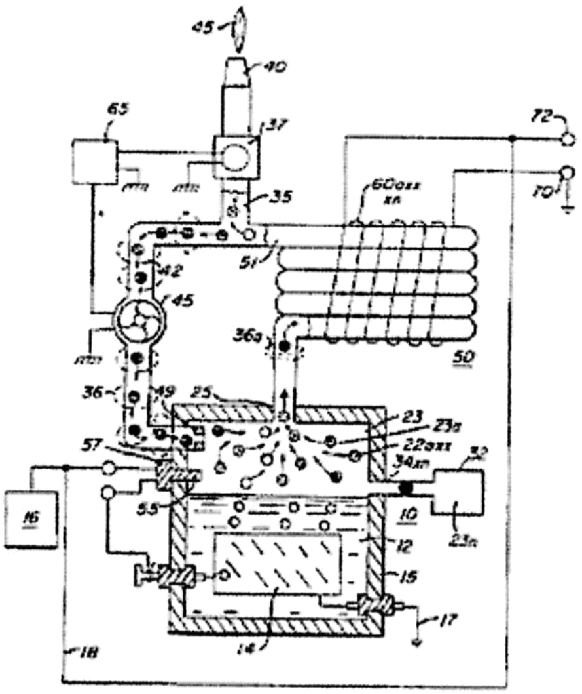


s electrical hydrogen generator

Patent number: US4613304
Publication date: 1986-09-23
Inventor: MEYER STANLEY A (US)
Applicant: MEYER STANLEY A
Classification:
- international: F23D14/62
- european: C01B3/04; F02B43/10; F02M25/12; G21K1/00
Application number: US19840668577 19841105
Priority number(s): US19840668577 19841105; US19820435889 19821021

Abstract of **US4613304**

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.



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Family list
4 family members for:
US4613304
Derived from 4 applications.

Back to US4613304

1 **GAS ELECTRICAL HYDROGEN GENERATOR**
Publication info: **CA1228833 A1** - 1987-11-03

2 **Gas electrical hydrogen generator**
Publication info: **EP0106917 A1** - 1984-05-02

3 **GAS GENERATION GENERATOR**
Publication info: **JP59132784 A** - 1984-07-30

4 **Gas electrical hydrogen generator**
Publication info: **US4613304 A** - 1986-09-23

Data supplied from the ***esp@cenet*** database - Worldwide

Famli 15

Hydrogen airdation injection system

Patent number: EP0122472
Publication date: 1984-10-24
Inventor: MEYER STANLEY A
Applicant: MEYER STANLEY A
Classification:
- international: F02B43/10; F02M21/06
- european: F02B43/10; F02M21/02
Application number: EP19840102824 19840315
Priority number(s): US19830478207 19830323

Also published as:
EP0122472 (A3)

Cited documents:
EP0111574
EP0086439
US3616779
US3648668
EP0101761
more >>

Abstract of **EP0122472**

System and apparatus for the controlled intermixing of hydrogen/oxygen gasses with non-combustible gasses to reduce the burning temperature and velocity of the hydrogen gas in a burner. The system utilizes a non-electrolysis hydrogen generator for developing the hydrogen/oxygen gasses. The hydrogen gas with non-volatile gasses are intermixed in a controlled air intake chamber. The exhaust gasses of the burner are returned as the non-volatile gasses to the mixing chamber in a closed loop arrangement. Upon attaining the proper burning temperature and velocity of the hydrogen gas the ratio of hydrogen/oxygen and non-volatile gasses is maintained. To effect a practical utilization, the generation of the hydrogen/oxygen gasses are controlled in start-up and in quantity. The control of the generation of gasses is effected by one or more variable parameters; such as varying the voltage applied to the plates, varying the pulse rate of the voltage on the plates, varying the spacing between the plates, switching the number of plates, and plate configuration. The hydrogen/oxygen generation is on demand; that is the hydrogen/oxygen generation on start-up is only on demand and thereafter generation is controlled in quantity by the need much in the same manner as an accelerator.

16

Hydrogen airdation injection system

Patent number: EP0122472
Publication date: 1984-10-24
Inventor: MEYER STANLEY A
Applicant: MEYER STANLEY A
Classification:
- international: F02B43/10; F02M21/06
- european: F02B43/10; F02M21/02
Application number: EP19840102824 19840315
Priority number(s): US19830478207 19830323

Also published as:
EP0122472 (A3)

Cited documents:
EP0111574
EP0086439
US3616779
US3648668
EP0101761
GB1517799
FR1178241
US3971847

Abstract of **EP0122472**

System and apparatus for the controlled intermixing of hydrogen/oxygen gasses with non-combustible gasses to reduce the burning temperature and velocity of the hydrogen gas in a burner. The system utilizes a non-electrolysis hydrogen generator for developing the hydrogen/oxygen gasses. The hydrogen gas with non-volatile gasses are intermixed in a controlled air intake chamber. The exhaust gasses of the burner are returned as the non-volatile gasses to the mixing chamber in a closed loop arrangement. Upon attaining the proper burning temperature and velocity of the hydrogen gas the ratio of hydrogen/oxygen and non-volatile gasses is maintained. To effect a practical utilization, the generation of the hydrogen/oxygen gasses are controlled in start-up and in quantity. The control of the generation of gasses is effected by one or more variable parameters; such as varying the voltage applied to the plates, varying the pulse rate of the voltage on the plates, varying the spacing between the plates, switching the number of plates, and plate configuration. The hydrogen/oxygen generation is on demand; that is the hydrogen/oxygen generation on start-up is only on demand and thereafter generation is controlled in quantity by the need much in the same manner as an accelerator.

Family list
3 family members for:
EP0122472
Derived from 2 applications.

Back to EP0122472

1 **HYDROGEN INJECTION SYSTEM**
Publication info: **CA1231872 A1** - 1988-01-26

2 **Hydrogen airdation injection system**
Publication info: **EP0122472 A2** - 1984-10-24
EP0122472 A3 - 1985-08-14

Data supplied from the ***esp@cenet*** database - Worldwide

Hydrogen airdation injection system

Patent number: EP0122472
Publication date: 1984-10-24
Inventor: MEYER STANLEY A
Applicant: MEYER STANLEY A
Classification:
- international: F02B43/10; F02M21/06
- european: F02B43/10; F02M21/02
Application number: EP19840102824 19840315
Priority number(s): US19830478207 19830323

Also published as:
EP0122472 (A3)

Cited documents:
EP0111574
EP0086439
US3616779
US3648668
EP0101761
GB1517799
FR1178241
US3971847

Abstract of **EP0122472**

System and apparatus for the controlled intermixing of hydrogen/oxygen gasses with non-combustible gasses to reduce the burning temperature and velocity of the hydrogen gas in a burner. The system utilizes a non-electrolysis hydrogen generator for developing the hydrogen/oxygen gasses. The hydrogen gas with non-volatile gasses are intermixed in a controlled air intake chamber. The exhaust gasses of the burner are returned as the non-volatile gasses to the mixing chamber in a closed loop arrangement. Upon attaining the proper burning temperature and velocity of the hydrogen gas the ratio of hydrogen/oxygen and non-volatile gasses is maintained. To effect a practical utilization, the generation of the hydrogen/oxygen gasses are controlled in start-up and in quantity. The control of the generation of gasses is effected by one or more variable parameters; such as varying the voltage applied to the plates, varying the pulse rate of the voltage on the plates, varying the spacing between the plates, switching the number of plates, and plate configuration. The hydrogen/oxygen generation is on demand; that is the hydrogen/oxygen generation on start-up is only on demand and thereafter generation is controlled in quantity by the need much in the same manner as an accelerator.

Family list
3 family members for:
EP0122472
Derived from 2 applications.

Back to EP0122472

1 **HYDROGEN INJECTION SYSTEM**
Publication info: **CA1231872 A1** - 1988-01-26

2 **Hydrogen airdation injection system**
Publication info: **EP0122472 A2** - 1984-10-24
EP0122472 A3 - 1985-08-14

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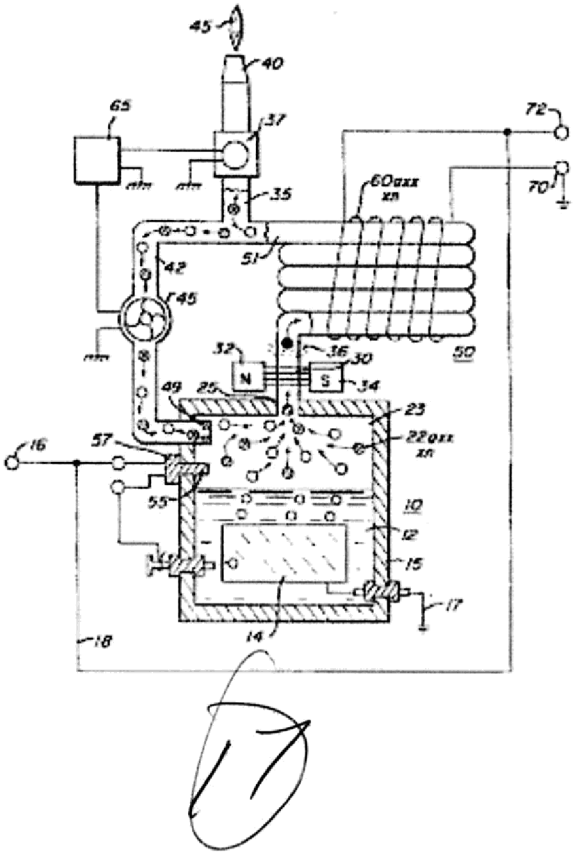
GAS GENERATION GENERATOR

Patent number: JP59132784
Publication date: 1984-07-30
Inventor: SUTANRII EI MEIYAA
Applicant: MEYER STANLEY A
Classification:
- international: C01B3/02; C01B13/02; H02N11/00
- european: C01B3/04; F02B43/10; F02M25/12; G21K1/00
Application number: JP19830182936 19830930
Priority number(s): US19820435889 19821021

Also published as:
EP0106917 (A1)

Abstract not available for JP59132784
Abstract of correspondent: **EP0106917**

A hydrogen gas generator system for converting water into hydrogen and oxygen gasses, in combination with a magnetic particle accelerator for voltage/current amplification. The hydrogen gas generator encompasses an array of plates immersed in water in a pressure tight enclosure. Direct current voltage 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. A hydrogen/oxygen gas mixture outlet means connected to the collection chamber of the generator includes a magnetic polarizer for establishing a magnetic field and thereby imparting a magnetic potential to the hydrogen gas and the oxygen gas atoms as they are being pressure released from the collection chamber. Attached to the gas outlet means is a non-magnetic conductive loop of tubing. A coil wound around the tubing will have a voltage induced therein as the pressure velocity polarized magnetized gas particles pass therethrough. The induced voltage has utilization as an electrical power source. The hydrogen and oxygen gas may be utilized such as in a burner system or alternatively returned to the gas storage portion of the hydrogen generator in a closed-loop arrangement for recycling.



Family list
4 family members for:
JP59132784
Derived from 4 applications.

Back to JP59132784

1 GAS ELECTRICAL HYDROGEN GENERATOR
Publication info: **CA1228833 A1** - 1987-11-03

2 Gas electrical hydrogen generator
Publication info: **EP0106917 A1** - 1984-05-02

3 GAS GENERATION GENERATOR
Publication info: **JP59132784 A** - 1984-07-30

4 Gas electrical hydrogen generator
Publication info: **US4613304 A** - 1986-09-23

Data supplied from the ***esp@cenet*** database - Worldwide

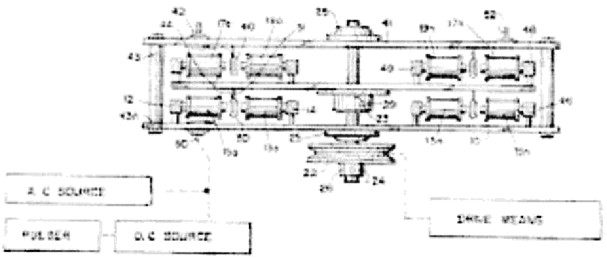
famili 17

Electrical pulse generator

Patent number:	US4613779
Publication date:	1986-09-23
Inventor:	MEYER STANLEY A (US)
Applicant:	MEYER STANLEY A
Classification:	
- international:	H02K16/00
- european:	H02K39/00; H02K57/00B
Application number:	US19830518534 19830729
Priority number(s):	US19830518534 19830729

Abstract of **US4613779**

An electrical pulse generator comprising a series of electromagnets spatially positioned about the outer circumference of a disc-like base and a second series of complimentary electromagnets positioned about an inner position on said disc. One of each of said first and second series electromagnets positioned relative to each other creating a magnetic field therebetween. A second disc-like base rotatable above and parallel with said first disc. A continuous coil winding ring mounted on the underside of said second disc and positioned relative to said first and second series of electromagnets to traverse said magnetic field upon rotation of said second disc and thereby inducing a voltage/current potential in said coil winding.



Family list
1 family member for:
US4613779
Derived from 1 application.

Back to US4613779

1 **Electrical pulse generator**
Publication info: **US4613779 A** - 1986-09-23

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famille 18

HYDROGEN AERATION TYPE INJECTOR

Patent number: JP59153922
Publication date: 1984-09-01
Inventor: SUTANRII EI MEIYAA
Applicant: MEYER STANLEY A
Classification:
- international: F02B43/00; F02B47/10; F02D19/02
- european:
Application number: JP19830023668 19830215
Priority number(s): JP19830023668 19830215

Abstract not available for JP59153922

19

Family list
3 family member for:
JP59153922
Derived from 1 application.

Back to JP59153922

1 **HYDROGEN AERATION TYPE INJECTOR**
Publication info: **JP1584224C C** - 1990-10-22
JP2000527B B - 1990-01-08
JP59153922 A - 1984-09-01

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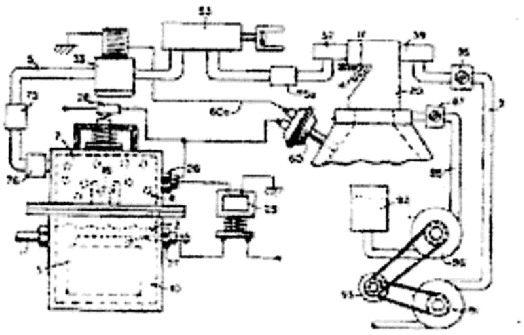
HYDROGEN GAS INJECTOR FOR INTERNAL COMBUSTION ENGINE

Patent number: JP58202352
Publication date: 1983-11-25
Inventor: SUTANRII EI MEIYAA
Applicant: MEYER STANLEY A
Classification:
- international: F02M21/02
- european: F02M25/12
Application number: JP19830023667 19830215
Priority number(s): US19820349185 19820217

Also published as:
EP0086439 (A1)
US4389981 (A1)
EP0086439 (B1)

Abstract not available for JP58202352
Abstract of correspondent: **US4389981**

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.



90

Family list
7 family members for:
JP58202352
Derived from 6 applications.

Back to JP58202352

1 **WASSERSTOFFZUFUEHRVORRICHTUNG FUER BRENNKRAFTMASCHINE**
Publication info: **AT50025T T** - 1990-02-15

2 **HYDROGEN GAS INJECTOR FOR INTERNAL COMBUSTION ENGINE**
Publication info: **CA1233379 A1** - 1988-03-01

3 **Hydrogen gas injector system for internal combustion engine**
Publication info: **DE3381176D D1** - 1990-03-08

4 **Hydrogen gas injector system for internal combustion engine**
Publication info: **EP0086439 A1** - 1983-08-24
EP0086439 B1 - 1990-01-31

5 **HYDROGEN GAS INJECTOR FOR INTERNAL COMBUSTION ENGINE**
Publication info: **JP58202352 A** - 1983-11-25

6 **Hydrogen gas injector system for internal combustion engine**
Publication info: **US4389981 A** - 1983-06-28

Data supplied from the ***esp@cenet*** database - Worldwide

GAS GENERATING GENERATOR

Patent number:	JP59148584
Publication date:	1984-08-25
Inventor:	SUTANRII EI MEIYAA
Applicant:	MEYER STANLEY A
Classification:	
- international:	F03G7/00; H02N11/00
- european:	
Application number:	JP19830023666 19830215
Priority number(s):	JP19830023666 19830215

Abstract not available for JP59148584

91

Family list
1 family member for:
JP59148584
Derived from 1 application.

Back to JP59148584

1 **GAS GENERATING GENERATOR**
Publication info: **JP59148584 A** - 1984-08-25

Data supplied from the ***esp@cenet*** database - Worldwide

family 91

HYDROGEN/OXYGEN GAS GENERATOR IN WHICH HYDROGEN GAS FLAME IS CONTROLLED

Patent number: JP59038525
Publication date: 1984-03-02
Inventor: SUTANRII EI MEIYAA
Applicant: MEYER STANLEY A
Classification:
- international: F23L7/00
- european: F02B43/10
Application number: JP19830023665 19830215
Priority number(s): US19820411977 19820825

Also published as:
EP0101761 (A2)
EP0101761 (A3)
EP0101761 (B1)

Abstract not available for JP59038525
Abstract of correspondent: **EP0101761**

A sustained controllable gas flame. The hydrogen generator utilized is that for separating gasses from water having impurities and other gasses entrapped therein. The gasses separated from the water comprises hydrogen, oxygen, and the non-combustible gasses, such as nitrogen. The nitrogen, oxygen and hydrogen are mixed as they are released in the process by the generator and collected as the mixture of gasses in the collection chamber of the generator. The method and system comprises a nozzle of a given configuration connected through a line to the uppermost region of the gas collection chamber of the hydrogen generator. The nitrogen reduces the velocity and temperature of the burning flame from that of the hydrogen/oxygen mixture. To further control the temperature and velocity of the burning gas mixture there is added to the collection chamber other non-burnable gasses. The configuration of the nozzle and its port opening is dependant on the mixture of gasses utilized and restricted thereby. An increase in the size of the flame requires additional port openings to prevent blowout. CROSS REFERENCE: The hydrogen/oxygen generator utilized in the present invention is that disclosed and claimed in my co-pending U.S. patent application, Serial Number: 302,807, filed: September 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

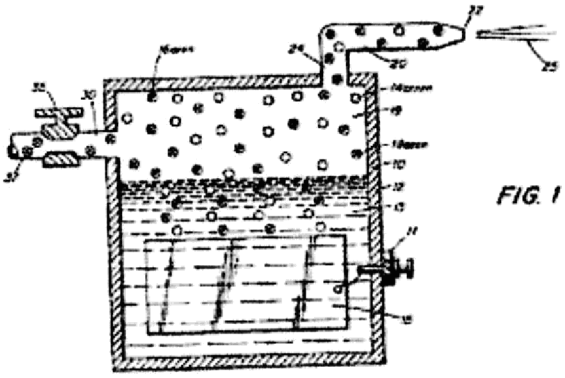


FIG. 1

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non-electrolytic water causes the hydrogen and oxygen atoms to be separated ... and similarly other gasses entrapped in the water such as nitrogen. The contaminents 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.

Family list
9 family members for:
JP59038525
Derived from 5 applications.

Back to JP59038525

1 VORRICHTUNG ZUR ERZEUGUNG VON GASEN AUS WASSER UND ZUR KONTROLLIERTEN VERBRENNUNG DIESER GASE
Publication info: **AT51438T T** - 1990-04-15

2 CONTROLLED HYDROGEN GAS FLAME
Publication info: **CA1235669 A1** - 1988-04-26

3 An apparatus for generating gases from water and for contolled burning of said gases
Publication info: **DE3280143D D1** - 1990-05-03

4 An apparatus for generating gases from water and for contolled burning of said gases
Publication info: **EP0101761 A2** - 1984-03-07
EP0101761 A3 - 1984-08-22
EP0101761 B1 - 1990-03-28

5 HYDROGEN/OXYGEN GAS GENERATOR IN WHICH HYDROGEN GAS FLAME IS CONTROLLED
Publication info: **JP1059490B B** - 1989-12-18
JP1577992C C - 1990-09-13
JP59038525 A - 1984-03-02

famille 22

ELECTRIC PARTICLE GENERATOR

Patent number: JP58207610
Publication date: 1983-12-03
Inventor: SUTANRII EI MEIYAA
Applicant: MEYER STANLEY A
Classification:
- international: H01F27/24; H01F31/00
- european: H01F30/10; H02K44/00
Application number: JP19830023664 19830215
Priority number(s): US19820367051 19820409

Also published as:
EP0098897 (A2)
EP0098897 (A3)

Abstract not available for JP58207610

03

Family list
4 family members for:
JP58207610
Derived from 3 applications.

Back to JP58207610

1 ELECTRICAL PARTICLE GENERATOR
Publication info: **CA1213671 A1** - 1986-11-04

2 Electrical generator utilizing magnetized particles
Publication info: **EP0098897 A2** - 1984-01-25
EP0098897 A3 - 1985-06-19

3 ELECTRIC PARTICLE GENERATOR
Publication info: **JP58207610 A** - 1983-12-03

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family 23

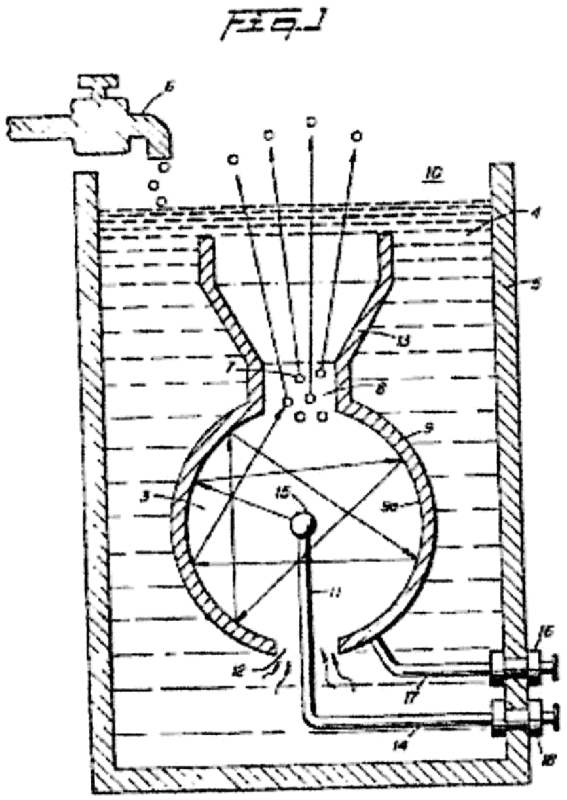
RESONANCE BARREL APPARATUS USED IN HYDROGEN GENERATING APPARATUS

Patent number: JP59059889
Publication date: 1984-04-05
Inventor: SUTANRII EI MEIYAA
Applicant: MEYER STANLEY A
Classification:
- international: C01B3/04; C01B13/02; C25B1/04; C25B9/00
- european: C01B3/04
Application number: JP19830023663 19830215
Priority number(s): US19820422594 19820924

Also published as:
EP0103656 (A2)
EP0103656 (A3)

Abstract not available for JP59059889
Abstract of correspondent: **EP0103656**

A direct current voltage exciter for utilization in a non-electrolysis process and apparatus for separating hydrogen/oxygen gas from water. The non-oxidizing exciters comprise a plate structure with negative potential applied to one such exciter plate and a positive potential applied to the other. The spacing between plates comprises a resonant cavity to a particular frequency. The direct current voltage is pulsed at a repetition rate that matches the frequency of the resonant cavity. The sub-atomic action of the direct current voltage on the plates is enhanced considerably by the bombardment of the atoms within the resonant structure. A spherical plate construction is described with alternative structures of a resonant line.



Family list
5 family members for:
JP59059889
Derived from 2 applications.

Back to JP59059889

1 **Resonant cavity for a hydrogen generator**
Publication info: **EP0103656 A2** - 1984-03-28
EP0103656 A3 - 1984-08-22

2 **RESONANCE BARREL APPARATUS USED IN HYDROGEN GENERATING APPA-RATUS**
Publication info: **JP1694782C C** - 1992-09-17
JP3045001B B - 1991-07-09
JP59059889 A - 1984-04-05

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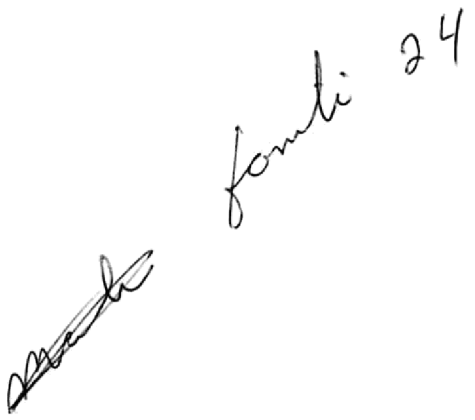

WASSERSTOFFZUFUEHRVORRICHTUNG FUER BRENNKRAFTMASCHINE

Patent number: AT50025T
Publication date: 1990-02-15
Inventor: MEYER STANLEY A
Applicant: MEYER STANLEY A
Classification:
- international: F02M25/12
- european:
Application number: AT19830101168T 19830208
Priority number(s): EP19830101168 19830208; US19820349185 19820217

Abstract not available for AT50025T

Family list
7 family members for:
AT50025T
Derived from 6 applications.

Back to AT50025T

1 **WASSERSTOFFZUFUEHRVORRICHTUNG FUER BRENNKRAFTMASCHINE**
Publication info: **AT50025T T** - 1990-02-15

2 **HYDROGEN GAS INJECTOR FOR INTERNAL COMBUSTION ENGINE**
Publication info: **CA1233379 A1** - 1988-03-01

3 **Hydrogen gas injector system for internal combustion engine**
Publication info: **DE3381176D D1** - 1990-03-08

4 **Hydrogen gas injector system for internal combustion engine**
Publication info: **EP0086439 A1** - 1983-08-24
EP0086439 B1 - 1990-01-31

5 **HYDROGEN GAS INJECTOR FOR INTERNAL COMBUSTION ENGINE**
Publication info: **JP58202352 A** - 1983-11-25

6 **Hydrogen gas injector system for internal combustion engine**
Publication info: **US4389981 A** - 1983-06-28

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family 95

HYDROGEN GENERATOR SYSTEM

Patent number:	CA1234774
Publication date:	1988-04-05
Inventor:	MEYER STANLEY A
Applicant:	MEYER STANLEY A
Classification:	
- international:	C25B1/04
- european:	
Application number:	CA19830420908 19830204
Priority number(s):	CA19830420908 19830204

Abstract of **CA1234774**

Process and apparatus for dissociating hydrogen atoms from a water molecule by electrical force. Particularly, the separation of the hydrogen and oxygen atoms from the water molecule by the application of a non-regulated, nonfiltered, low-power, direct current voltage electrical potential applied to two non-oxidizing similar metal plates having water passing therebetween. The direct current voltage may be continuous, but the action can be enhanced by pulsing the non-regulated and non-filtered direct current voltage. The apparatus comprises various constructional configurations and alternative embodiments for segregating the generated hydrogen gas from the oxygen gas. The water need not be pure and may contain contaminants. The release of the hydrogen and oxygen atoms causes the contaminants to fall away, thereby enabling the system to be utilized in a liquid slurry removal system. Alternatively, the recombining of the hydrogen and oxygen would give pure water.

26

Family list
1 family member for:
CA1234774
Derived from 1 application.

Back to CA1234774

1 **HYDROGEN GENERATOR SYSTEM**
Publication info: **CA1234774 A1** - 1988-04-05

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famli 96

RESONANT CAVITY HYDROGEN GENERATOR THAT OPERATES WITH A PULSED VOLTAGE ELECTRICAL POTENTIAL

Patent number:	CA1234773
Publication date:	1988-04-05
Inventor:	MEYER STANLEY A
Applicant:	MEYER STANLEY A
Classification:	
- international:	C25B1/04
- european:	
Application number:	CA19830420902 19830204
Priority number(s):	US19820065797 19820924

Abstract of **CA1234773**

A process is disclosed for producing hydrogen and oxygen gasses from water which includes having water in a cavity which has a selected resonant frequency and applying of voltage potential to exciter elements in contact with the water in the cavity so that one elements maintains a positive charge and the other a negative charge. The voltage potential is pulsed at a frequency matching the resonant frequency of the cavity. The apparatus includes a spherical shell which is a first exciter element formed of an electrically conductive non-reactive material and defines the boundary of a cavity. The cavity has a pre-determined resonant frequency and a second exciter element of the same material as the first exciter element is located within the cavity in selected spaced relationship therewith. Water can flow into the cavity and gasses produced outflow from the top of the cavity, such gasses being obtained from the water in the cavity when an electrical pulsating potential is applied to the exciter elements.

01

Family list
1 family member for:
CA1234773
Derived from 1 application.

Back to CA1234773

1 **RESONANT CAVITY HYDROGEN GENERATOR THAT OPERATES WITH A PULSED VOLTAGE ELECTRICAL POTENTIAL**
Publication info: **CA1234773 A1** - 1988-04-05

Data supplied from the ***esp@cenet*** database - Worldwide

famli 07

HYDROGEN/AIR AND NON-CUMBUSTIBLE GAS MIXING COMBUSTION SYSTEM

Patent number: CA1227094
Publication date: 1987-09-22
Inventor: MEYER STANLEY A
Applicant: MEYER STANLEY A
Classification:
- international: F02M21/04
- european:
Application number: CA19830420889 19830204
Priority number(s): CA19830420889 19830204

Abstract of **CA1227094**

An internal combustion engine fuel supply and control that includes apparatus for disassociating hydrogen atoms and oxygen atoms from water and mixing the gas so produced with a non-combustible gas in a predetermined ratio. The gas mixture is mixed with air in suitable proportions and controllably directed to the combustion chamber of the internal combustion engine.

Family list
1 family member for:
CA1227094
Derived from 1 application.

Back to CA1227094

1 **HYDROGEN/AIR AND NON-CUMBUSTIBLE GAS MIXING COMBUSTION SYSTEM**
Publication info: **CA1227094 A1** - 1987-09-22

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HYDROGEN GENERATING DEVICE AND METHOD

Patent number: JP59129791
Publication date: 1984-07-26
Inventor: SUTANRII EI MEIYAA
Applicant: MEYER STANLEY A
Classification:
- international: C01B3/04; C01B13/02; C25B1/04; C25B9/00
- european:
Application number: JP19830001022 19830107
Priority number(s): JP19830001022 19830107

Abstract not available for JP59129791

29

Family list
1 family member for:
JP59129791
Derived from 1 application.

Back to JP59129791

1 **HYDROGEN GENERATING DEVICE AND METHOD**
Publication info: **JP59129791 A** - 1984-07-26

Data supplied from the ***esp@cenet*** database - Worldwide

Combustion system for mechanical drive systems using gaseous hydrogen as fuel

Patent number: EP0111574
Publication date: 1984-06-27
Inventor: MEYER STANLEY A
Applicant: MEYER STANLEY A
Classification:
- international: F02B47/10; F02M25/06; F23L7/00; F23C9/00; F02B43/10; F02M21/02
- european: F02B43/10; F02B47/10; F02M21/02; F02M25/06; F23C9/00; F23L7/00
Application number: EP19820111596 19821214
Priority number(s): EP19820111596 19821214

Also published as:
EP0111574 (B1)

Cited documents:
FR2096416
US3648668
FR1178241
US3971847
GB2079441
more >>

Abstract of **EP0111574**

System and apparatus for the controlled intermixing of hydrogen volatile gas with non-combustible gasses in a combustion system. The system utilizes a hydrogen generator (10) for developing a controlled output of hydrogen and oxygen gasses and non-volatile gasses such as nitrogen. The hydrogen gas with the attendant gasses and added gasses are fed via a line (5) (9) to an air intake system (20) in a controlled ratio. The combined gasses after intermixing are fed to a combustion chamber (30) wherein the mixture is ignited. The exhaust gasses of the combustion chamber (30) are returned in a closed loop arrangement to the mixing chamber (40) as non-volatile gasses to control the velocity and temperature of the volatile hydrogen gas.

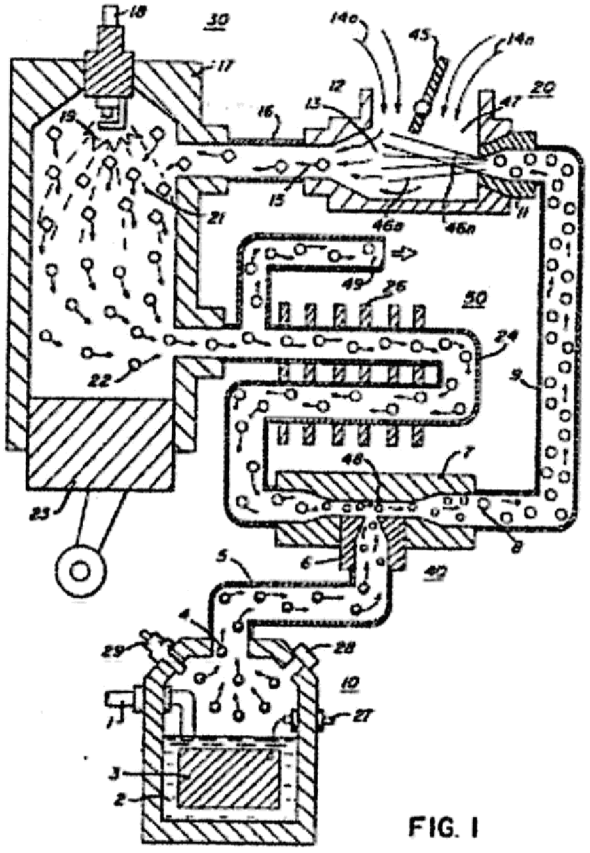

FIG. 1

Combustion system for mechanical drive systems using gaseous hydrogen as fuel

Patent number: EP0111574
Publication date: 1984-06-27
Inventor: MEYER STANLEY A
Applicant: MEYER STANLEY A
Classification:
- international: F02B47/10; F02M25/06; F23L7/00; F23C9/00; F02B43/10; F02M21/02
- european: F02B43/10; F02B47/10; F02M21/02; F02M25/06; F23C9/00; F23L7/00
Application number: EP19820111596 19821214
Priority number(s): EP19820111596 19821214

Also published as:
EP0111574 (B1)

Cited documents:
FR2096416
US3648668
FR1178241
US3971847
GB2079441
GB1517799
US4059076
less <<

Abstract of **EP0111574**

System and apparatus for the controlled intermixing of hydrogen volatile gas with non-combustible gasses in a combustion system. The system utilizes a hydrogen generator (10) for developing a controlled output of hydrogen and oxygen gasses and non-volatile gasses such as nitrogen. The hydrogen gas with the attendant gasses and added gasses are fed via a line (5) (9) to an air intake system (20) in a controlled ratio. The combined gasses after intermixing are fed to a combustion chamber (30) wherein the mixture is ignited. The exhaust gasses of the combustion chamber (30) are returned in a closed loop arrangement to the mixing chamber (40) as non-volatile gasses to control the velocity and temperature of the volatile hydrogen gas.

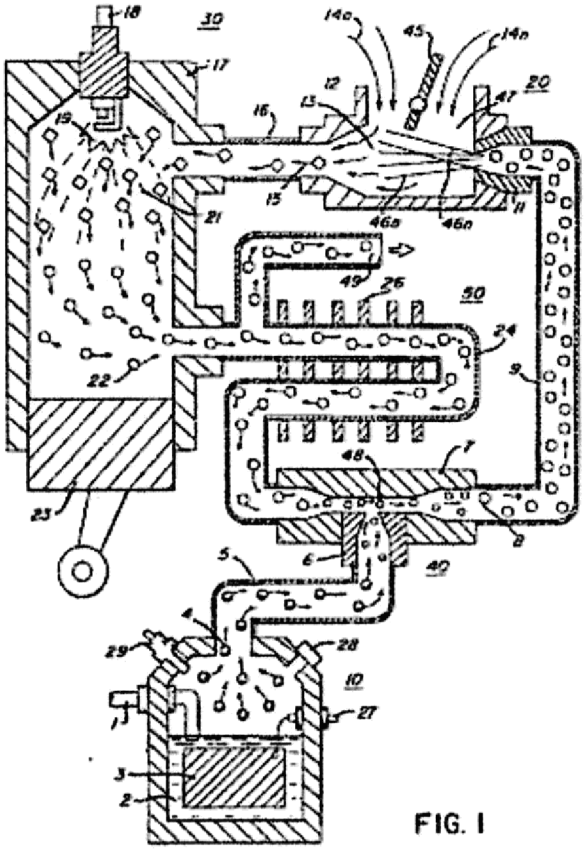

FIG. I

Family list
4 family members for:
EP0111574
Derived from 3 applications.

Back to EP0111574

1 **VERBRENNUNGSEINRICHTUNG FUER MECHANISCHE ANTRIEBSSYSTEME UNTER VERWENDUNG VON WASSERSTOFFGAS ALS BRENNSTOFF**
Publication info: **AT67276T T** - 1991-09-15

2 **Combustion system for mechanical drive systems using gaseous hydrogen as fuel**
Publication info: **DE3280356D D1** - 1991-10-17

3 **Combustion system for mechanical drive systems using gaseous hydrogen as fuel**
Publication info: **EP0111574 A1** - 1984-06-27
EP0111574 B1 - 1991-09-11

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famli 30

VORRICHTUNG ZUR ERZEUGUNG VON GASEN AUS WASSER UND ZUR KONTROLLIERTEN VERBRENNUNG DIESER GASE

Patent number: AT51438T
Publication date: 1990-04-15
Inventor: MEYER STANLEY A
Applicant: MEYER STANLEY A
Classification:
- international: F23D14/02; C25B1/04
- european:
Application number: AT19820111597T 19821214
Priority number(s): EP19820111597 19821214; US19820411977 19820825

Abstract not available for AT51438T

Family list
9 family members for:
AT51438T
Derived from 5 applications.

Back to AT51438T

1 **VORRICHTUNG ZUR ERZEUGUNG VON GASEN AUS WASSER UND ZUR KONTROLLIERTEN VERBRENNUNG DIESER GASE**
Publication info: **AT51438T T** - 1990-04-15

2 **CONTROLLED HYDROGEN GAS FLAME**
Publication info: **CA1235669 A1** - 1988-04-26

3 **An apparatus for generating gases from water and for contolled burning of said gases**
Publication info: **DE3280143D D1** - 1990-05-03

4 **An apparatus for generating gases from water and for contolled burning of said gases**
Publication info: **EP0101761 A2** - 1984-03-07
EP0101761 A3 - 1984-08-22
EP0101761 B1 - 1990-03-28

5 **HYDROGEN/OXYGEN GAS GENERATOR IN WHICH HYDROGEN GAS FLAME IS CONTROLLED**
Publication info: **JP1059490B B** - 1989-12-18
JP1577992C C - 1990-09-13
JP59038525 A - 1984-03-02

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famli 32

VERBRENNUNGSEINRICHTUNG FUER MECHANISCHE ANTRIEBSSYSTEME UNTER VERWENDUNG VON WASSERSTOFFGAS ALS BRENNSTOFF

Patent number:	AT67276T
Publication date:	1991-09-15
Inventor:	MEYER STANLEY A
Applicant:	MEYER STANLEY A
Classification:	
- international:	F02B47/10; F02B43/10; F02M21/02; F02M25/06; F23L7/00; F23C9/00
- european:	F02B43/10; F02B47/10; F02M21/02; F02M25/06; F23C9/00; F23L7/00
Application number:	AT19820111596T 19821214
Priority number(s):	EP19820111596 19821214

Abstract not available for AT67276T

famili 33

Family list
4 family members for:
AT67276T
Derived from 3 applications.

Back to AT67276T

1 **VERBRENNUNGSEINRICHTUNG FUER MECHANISCHE ANTRIEBSSYSTEME UNTER VERWENDUNG VON WASSERSTOFFGAS ALS BRENNSTOFF**
Publication info: **AT67276T T** - 1991-09-15

2 **Combustion system for mechanical drive systems using gaseous hydrogen as fuel**
Publication info: **DE3280356D D1** - 1991-10-17

3 **Combustion system for mechanical drive systems using gaseous hydrogen as fuel**
Publication info: **EP0111574 A1** - 1984-06-27
EP0111574 B1 - 1991-09-11

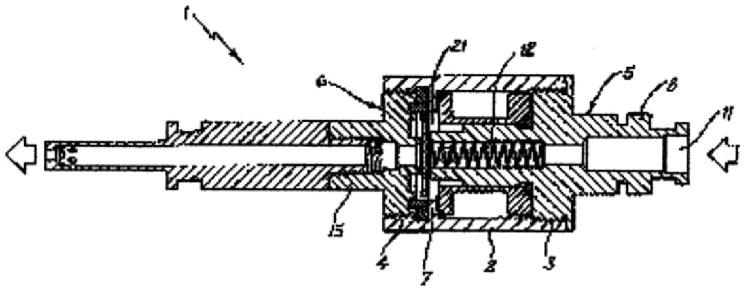
Data supplied from the ***esp@cenet*** database - Worldwide

(12) **Patent Application:** (11) **CA 2305244**

(54) VAPOUR FUEL INJECTION VALVE

(54) INJECTEUR DE CARBURANT SOUS FORME DE VAPEUR

epresentative Drawing:



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BSTRACT:
vapour gas injector valve (1) for the injection of liquid petroleum gas
PG) and other gaseous fuels into the cylinder (2) of an internal combustion engine includes
valve chamber (21) having an inlet port and an outlet port having a flared throat. A valve
ember is trapped within the valve chamber and moveable between a first position in which it
als against a valve seat surrounding the outlet port, and a second position in which gas may
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agnetisable material having one or more holes through it. An electrical winding is selectively
ergisable to create a magnetic field within the valve chamber to draw the valve member
m the first position to the second position.

LAIMS: Show all claims

Note: Data on abstracts and claims is shown in the official language in which it was

72)	Inventors (Country):	**CAMPBELL, BILL ROSS** (Australia)
73)	Owners (Country):	**GAS INJECTION TECHNOLOGIES PTY. LTD.** (Australia)
71)	Applicants (Country):	**GAS INJECTION TECHNOLOGIES PTY. LTD.** (Australia)
74)	Agent:	**ROBIC**
45)	Issued:	
86)	PCT Filing Date:	**Oct. 7 , 1998**
87)	PCT Publication Date:	**Apr. 15, 1999**
	Examination requested:	**Oct. 6 , 2003**
51)	International Class (IPC):	**F02M 51/00** **F02M 51/02** **F02M 51/06** **F02M 61/16** **F02M 61/18**

Patent Cooperation Treaty (PCT): **Yes**

35) National Entry:	**Apr. 6 , 2000**
36) PCT Filing number:	**PCT/AU1998/000837**
37) International publication number:	**WO1999/018345**

30) Application priority data:

Application No.	Country	Date
O 9648	Australia	Oct. 7 , 1997

Availability of licence: **N/A**

Language of filing: **English**

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ast Modified: 2002-12-31

Important Notices

2) **Patent Application:** (11) **CA 2305244**

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dministrative Status:

Title	Date
86) PCT Filing Date	Oct. 7 , 1998
87) PCT Publication Date	Apr. 15, 1999
85) National Entry	Apr. 6 , 2000
Examination Requested	Oct. 6 , 2003

laintenance Fee:

Description	Date	Amount
Last Payment	Sep. 15, 2005	100.00
Next Payment if small entity	Oct. 9 , 2006	100.00
Next Payment if large entity	Oct. 9 , 2006	200.00

ote: If the full payment has not been received on or before the date indicated, a rther fee may be required which may be one of the following:

- the reinstatement fee set out in Item 7 of Schedule II of the *Patent Rules*;
- the late payment fee set out in Item 22.1 of Schedule II of the *Patent Rules*; or
- the additional fee for late payment set out in Items 31 and 32 of Schedule II of the *Patent Rules*.

atent Document Number 2305244 :
APOUR FUEL INJECTION VALVE

NJECTEUR DE CARBURANT SOUS FORME DE VAPEUR

LAIMS:

8
CLAIMS

1. A gas injector valve, including: a valve chamber having an inlet port and an outlet port having a flared throat, a valve member trapped within the valve chamber and moveable between a first position in which it seals against a valve seat surrounding the outlet port, and a second position in which gas may flow from the inlet port to the outlet port; where the valve member comprises a disc of hard magnetisable material having one or more holes though it; and where an electrical winding is selectively energisable to create a magnetic field within the valve chamber to draw the valve member from the first position to the second position.

2. A gas injector valve according to claim 1, where two electrical windings are used; a first having a low resistance to open the valve quickly, and a second having a higher resistance to hold the valve open for the required period of time.

3. A gas injector valve according to claim 1 or 2, where the valve member comprises a disc of hardened steel having a ratio of diameter to thickness of about 14:1.

4. A gas injector valve according to claim 3, where the diameter of the disc is 13.8mm and the thickness is 1mm.

5. A gas injector valve according to claim 3, where the ratio of the diameter of the disc to the diameters of the inlet and outlet is about 4:1.

6. A gas injector valve according to claim 3, where the disc has a series of eight holes, each having a diameter of 1.3mm, around its edge and outside the area bounded by the valve seat when the valve member is in the first position.

7. A gas injector valve according to claim 3, where the ratio of the thickness of the disc to the distance the disc travels between the first and second positions is about 3.33:1.

7

8. A gas injector valve according to claim 3, where a return spring is used to bias the valve member to the first position.

9. A gas injector valve according to claim 1, where the end of the outlet port is formed by a chamfered edge of the valve seat.

10. A gas injector valve according to claim 9, where the chamfer is about

450.

11. A gas injector valve according to claim 10, where the chamfer leads into a bore which has a diameter of 3.5mm.

12. A gas injector valve according to claim 9, where the chamfer on the outlet has a thickness of about 0.85mm.

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CANADIAN INTELLECTUAL PROPERTY OFFICE

(12) (19) (CA) **Demande-Application**

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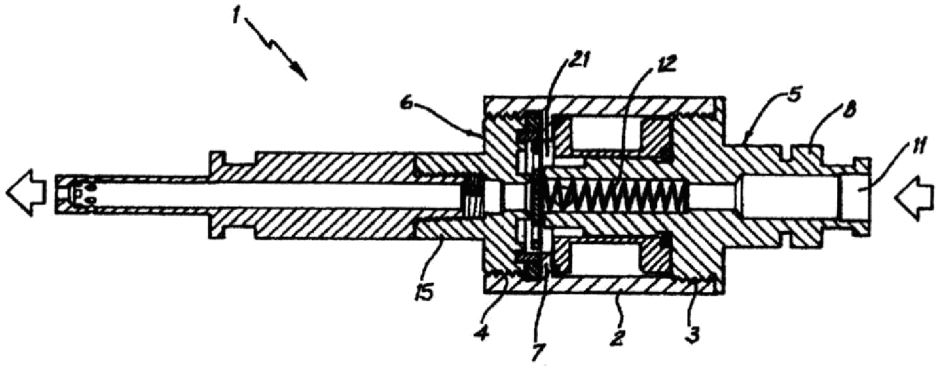
(86) 1998/10/07
(87) 1999/04/15

(72) CAMPBELL, BILL ROSS, AU
(71) GAS INJECTION TECHNOLOGIES PTY. LTD., AU

(51) Int.Cl.[6] F02M 51/00, F02M 61/18, F02M 61/16, F02M 51/06, F02M 51/02
(30) 1997/10/07 (PO 9648) AU

(54) **INJECTEUR DE CARBURANT SOUS FORME DE VAPEUR**
(54) **VAPOUR FUEL INJECTION VALVE**



(57) L'invention concerne un injecteur de gaz (1) servant à injecter du gaz de pétrole liquéfié (GPL) et d'autres combustibles gazeux dans le cylindre (2) d'un moteur à combustion interne. Cet injecteur comprend une chambre à soupape (21) présentant un orifice d'entrée et un orifice de sortie avec une extrémité évasée. Un élément soupape est emprisonné dans la chambre à soupape et peut se déplacer entre une première position dans laquelle il assure l'étanchéité vis-à-vis d'un siège de soupape entourant l'orifice de sortie, et une seconde position dans laquelle le gaz peut s'écouler à partir de l'orifice d'entrée vers l'orifice de sortie. L'élément soupape comprend un disque en matériau magnétisable dur, présentant un ou plusieurs orifices. Un enroulement électrique peut être alimenté en courant de façon sélective pour créer un champ magnétique à l'intérieur de la chambre à soupape en vue de faire passer l'élément soupape de la première à la seconde position.

(57) A vapour gas injector valve (1) for the injection of liquid petroleum gas (LPG) and other gaseous fuels into the cylinder (2) of an internal combustion engine includes a valve chamber (21) having an inlet port and an outlet port having a flared throat. A valve member is trapped within the valve chamber and moveable between a first position in which it seals against a valve seat surrounding the outlet port, and a second position in which gas may flow from the inlet port to the outlet port. The valve member comprises a disc of hard magnetisable material having one or more holes through it. An electrical winding is selectively energisable to create a magnetic field within the valve chamber to draw the valve member from the first position to the second position.

PCT WORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

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(30) Priority Data:
PO 9648 7 October 1997 (07.10.97) AU

(71) Applicant *(for all designated States except US)*: GAS INJECTION TECHNOLOGIES PTY. LTD. [AU/AU]; 10 Rawson Road, Guildford, NSW 2161 (AU).

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(74) Agent: F.B. RICE & CO.; 605 Darling Street, Balmain, NSW 2041 (AU).

(81) Designated States: AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

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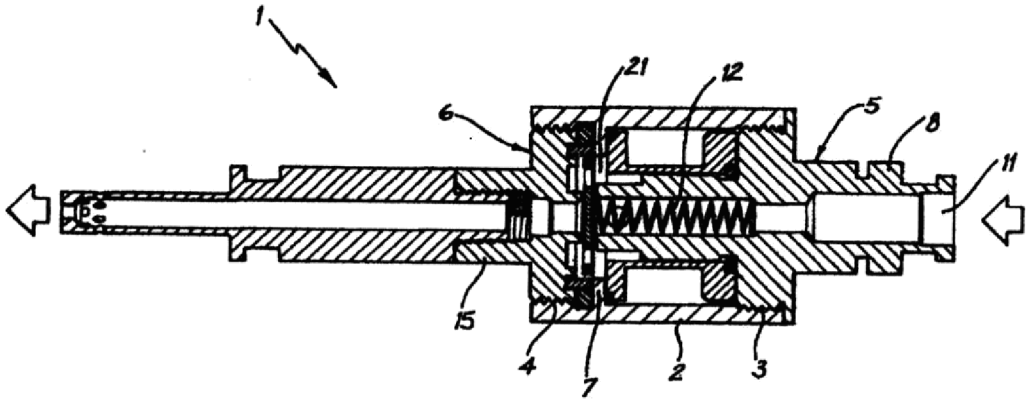
With international search report.

(54) Title: VAPOUR FUEL INJECTION VALVE



(57) Abstract

A vapour gas injector valve (1) for the injection of liquid petroleum gas (LPG) and other gaseous fuels into the cylinder (2) of an internal combustion engine includes a valve chamber (21) having an inlet port and an outlet port having a flared throat. A valve member is trapped within the valve chamber and moveable between a first position in which it seals against a valve seat surrounding the outlet port, and a second position in which gas may flow from the inlet port to the outlet port. The valve member comprises a disc of hard magnetisable material having one or more holes through it. An electrical winding is selectively energisable to create a magnetic field within the valve chamber to draw the valve member from the first position to the second position.

CLAIMS

1. A gas injector valve, including: a valve chamber having an inlet port and an outlet port having a flared throat, a valve member trapped within the valve chamber and moveable between a first position in which it seals against a valve seat surrounding the outlet port, and a second position in which gas may flow from the inlet port to the outlet port; where the valve member comprises a disc of hard magnetisable material having one or more holes though it; and where an electrical winding is selectively energisable to create a magnetic field within the valve chamber to draw the valve member from the first position to the second position.

2. A gas injector valve according to claim 1, where two electrical windings are used; a first having a low resistance to open the valve quickly, and a second having a higher resistance to hold the valve open for the required period of time.

3. A gas injector valve according to claim 1 or 2, where the valve member comprises a disc of hardened steel having a ratio of diameter to thickness of about 14:1.

4. A gas injector valve according to claim 3, where the diameter of the disc is 13.8mm and the thickness is 1mm.

5. A gas injector valve according to claim 3, where the ratio of the diameter of the disc to the diameters of the inlet and outlet is about 4:1.

6. A gas injector valve according to claim 3, where the disc has a series of eight holes, each having a diameter of 1.3mm, around its edge and outside the area bounded by the valve seat when the valve member is in the first position.

7. A gas injector valve according to claim 3, where the ratio of the thickness of the disc to the distance the disc travels between the first and second positions is about 3.33:1.

8. A gas injector valve according to claim 3, where a return spring is used to bias the valve member to the first position.

9. A gas injector valve according to claim 1, where the end of the outlet port is formed by a chamfered edge of the valve seat.

10. A gas injector valve according to claim 9, where the chamfer is about 45o.

11. A gas injector valve according to claim 10, where the chamfer leads into a bore which has a diameter of 3.5mm.

12. A gas injector valve according to claim 9, where the chamfer on the outlet has a thickness of about 0.85mm.

VAPOUR FUEL INJECTION VALVE

Technical Field

This invention concerns a vapour gas injector valve, that is a valve for the injection of liquid petroleum gas (LPG) and other gaseous fuels, rather than petrol (gasoline) or diesel, into the cylinder of an internal combustion engine.

Background Art

LPG, natural gas and hydrogen are cleaner and potentially less expensive fuels than petrol for automobiles. As a result cars are currently being built with LPG fuel systems, and existing cars are being converted to run on LPG. Where the engine is carbureted, conversion is fairly straight forward, however, it has been difficult to convert fuel injection systems because of the very high volume of LPG that must be injected compared to petrol.

Summary of the Invention

The invention is a gas injector valve, including: a valve chamber having an inlet port and an outlet port having a flared throat. A valve member is trapped within the valve chamber and moveable between a first position in which it seals against a valve seat surrounding the outlet port, and a second position in which gas may flow from the inlet port to the outlet port. The valve member comprises a disc of hard magnetisable material having one or more holes though it. An electrical winding is selectively energisable to create a magnetic field within the valve chamber to draw the valve member from the first position to the second position. Two electrical windings may be used although this is not essential. A first having a low resistance to open the valve quickly, and a second having a higher resistance to hold the valve open for the required period of time. The materials, shapes and configurations of the valve member and the valve chamber, including the inlet and outlet ports are selected to achieve flow rates of vapour sufficient for internal combustion engine operation. The injector valve may be very compact and may enjoy operating noise that is less than or equal to petrol injectors.

The valve member may comprise a disc of hardened steel having a ratio of diameter to thickness of about 14:1. In one example the diameter is

13.8mm and the thickness is 1mm. The ratio of the diameter of the disc to the diameters of the inlet and outlet is about 4:1. The disc may have a series of eight holes, each having a diameter of 1.3mm, around its edge and outside the area bounded by the valve seat when the valve member is in the first position. The ratio of the thickness of the disc to the distance the disc travels between the first and second positions is about 3.33:1.

A return spring may be used to bias the valve member to the first position.

The flared end of the outlet port may be formed by a chamfered edge of the valve seat, the chamfer may be about 45o, and may lead into a bore, which may have a diameter of 3.5mm. The chamfer on the outlet may have a thickness of about 0.85mm.

Brief Description of the Drawings

An example of the invention will now be described with reference to the accompanying drawings, in which:

Figure 1 is a section through gas injector valve;

Figure 2 is an exploded view of the valve; and

Figure 3 is a pictorial view of the valve member.

The same reference numerals have been used throughout the drawings to refer to corresponding features.

Best Modes for Carrying out the Invention

Gas injector valve 1 has a steel cylindrical outer sleeve 2 having a diameter of 24mm and a length of 35.7mm. The sleeve has 7/8" thread formations, 3 and 4, at the inlet and outlet ends respectively. The sleeve is closed by a steel inlet cap 5 screwed into the inlet thread formations 3, and a steel outlet cap 6 screwed into the thread formations 4 at the other end. The outlet cap 6 extends into the cylinder 2 to meet a circular flange 7 which is integral to the cylinder and which extends radially inward to define a circular hole 14.3mm in diameter, and about 7.5mm from the outlet end.

The inlet cap 5 comprises a nozzle 8, a body 9 and an extension 10 which extends into the circular hole bounded by flange 7. A bore 11 extends axially through the inlet cap. In the region of the nozzle 8, bore 11 has a relatively large diameter of 5.5mm, which narrows to 3mm as it passes through the body and widens to an intermediate diameter of 4.1mm in the

distal half of extension 10 to accommodate a return spring 12 (shown only in Figure 1). The tip 13 of extension 10 thins and is penetrated by two holes 14 each 2.5mm in diameter. A filter (not shown) may be fitted at the inlet if required.

The outlet cap 6 is made from 304 Stainless Steel, and it has an extension 15 and a body 16. The inner face of the body has an outer circular groove 17, which cooperates with spacer ring 18 to abut against the side of radial flange 7 to form a seal with the help of 'O'-ring 19. The inner face of the body is lapped to form a valve seat 20 at its centre.

A cylindrical chamber 21 is created within the valve. The chamber is bounded radially by the flange 7 and the spacer 18, and at one side by the valve seat 20. The other side the chamber 21 is bounded by the distal end 13 of extension 10. The inside of spacer 18, the valve seat 20 and the distal end 13 are all hardened. The valve seat has a 45o chamfer 22 leading into the bore 23 which has a diameter of 3mm. The bore subsequently widens in the nozzle.

An outlet nozzle 24 is connected into extension 15 of outlet cap 6 to facilitate improved mixing of the gas with the incoming air.

A plastics former 25 carrying electrical windings fits onto the extension 10 of inlet cap 5. 'O'-rings 26 and 27 seal respective ends of the plastics former between the inner face of body 9 and the flange 7. Two windings are carried on the plastics former 25. The first winding is formed of 0.28 mm wire and has 135 turns to give an impedance of 1.6 Ω, and the second winding is formed of 0.18 mm wire and has 360 turns to give an impedance of 15.2 Ω. The windings are connected to electrical supply terminals (not shown) to enable them to be energised by an external source of electrical power (not shown) under the control of the vehicle's on-board computer (not shown). The first, low impedance, coil is energised for 2 to 3 milliseconds by a transistor earthing through a switching device in a manner which does not load the computer. This opens the injector quickly. The second, high impedance, coil matches the standard 15 Ω expected of injectors by the on-board computer, and is controlled by the computer as normal to hold the injector open for the required time. In this manner the injector is opened quickly but not so as to overload the computer. The back emf can also be fed back to the computer if required to check that the

injectors are connected correctly. The switching device is encapsulated into the wiring plug of the injector.

A flutter valve 28 resides in the cylindrical chamber 21. The valve comprises a disc of AS1442/M1020 low carbon steel hardened using a Carbo Nitriding process to hardness of 58 Rockwell C. The disc weighs 0.9538 grams. The disc has a diameter of 13.8mm and a thickness of 1.2mm which is ground to 1mm after hardening. The disc has a series of eight holes 29, each having a diameter of 1.3mm, around its edge outside the valve seat 20. The centres of the holes 29 are 4.2mm from the centre of the disc 28. The valve is moveable between a first position in which it closes against the valve seat 20, and a second position in which it is drawn away from the valve seat. The travel of the disc valve is 0.3 mm

The injector works in the following way. Adaptors are fitted to the inlet nozzle 8 and the outlet nozzle 24 so that the injector is able to be fitted in place of the original petrol injectors. Gas flows through the inlet nozzle 8, and passes through the bore 11 to the valve disc 28. If the valve disc 28 is closed against outlet seat 20 the gas flow is stopped and builds up in the chamber 21. When an electric current is passed through the electrical windings the valve disc 28 is attracted to the solenoid core which lifts the disc off its seat allowing vapour to pass, via transverse holes 14, through the holes 29 in the disc and through the outlet bore 23.

The valve may be operated with opening times of 1.4 milliseconds, closing times of 2.0 milliseconds and a flow rate of 80 litres per minute vapour.

Although the invention has been described with reference to a particular example it should be appreciated that the dimensions of the valve will change for different sized valves. It should also be understood that the inlet and outlet caps need not be screwed onto the cylindrical sleeve of the injector valve, and any other convenient method of attachment may be used, such as crimping.

The vapour fuel is supplied to the injector from a liquid reservoir, and before it reaches the injector it passes through a two stage regulator and filter to condition it for combustion. In the first stage of the regulator the liquid at about 100 psi is converted to gas at about 40 psi. The gas then passes through a narrow labyrinthine path where it is warmed by the engine's coolant before entering the second regulator. The second 'gas

pressure' regulator lowers the gas pressure to inlet manifold pressure. The gas is filtered as it leaves the regulator, and again at the injector.

It will be appreciated by persons skilled in the art that numerous variations and/or modifications may be made to the invention as shown in the specific embodiments without departing from the spirit or scope of the invention as broadly described. The present embodiments are, therefore, to be considered in all respects as illustrative and not restrictive.

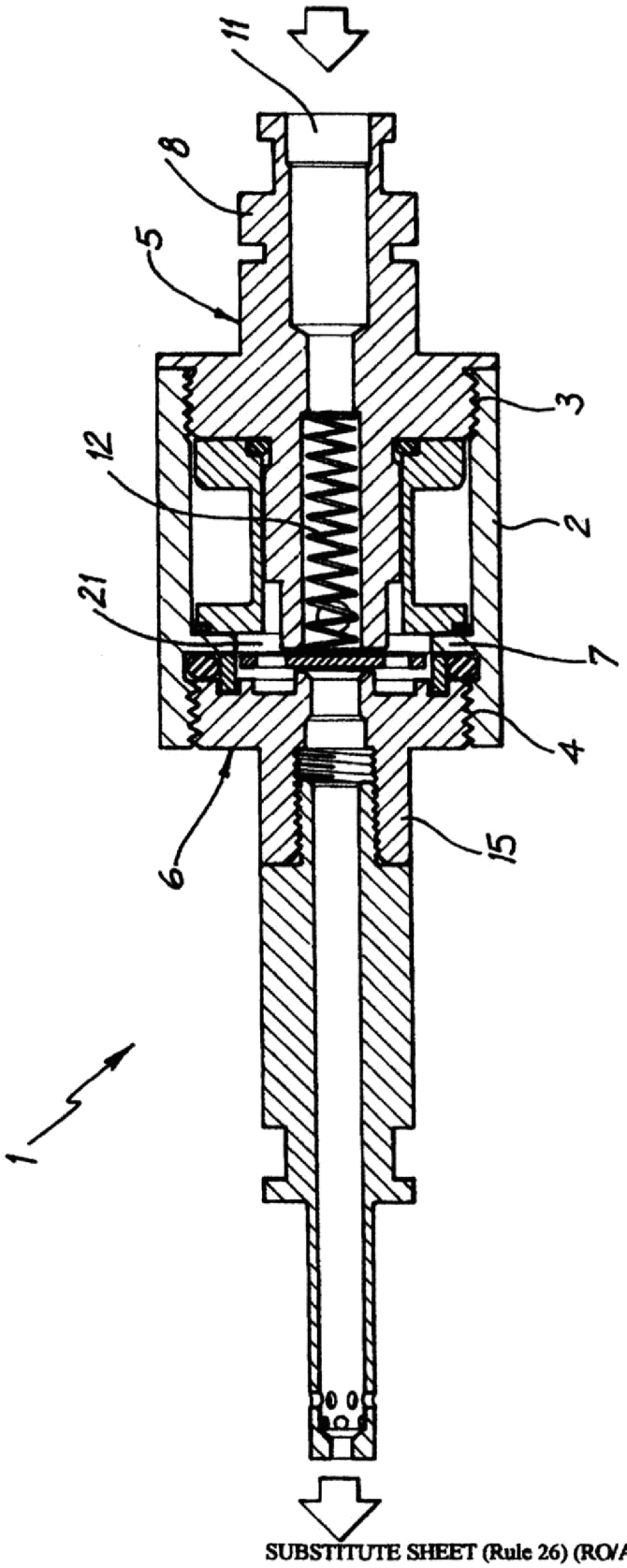


FIG. 1

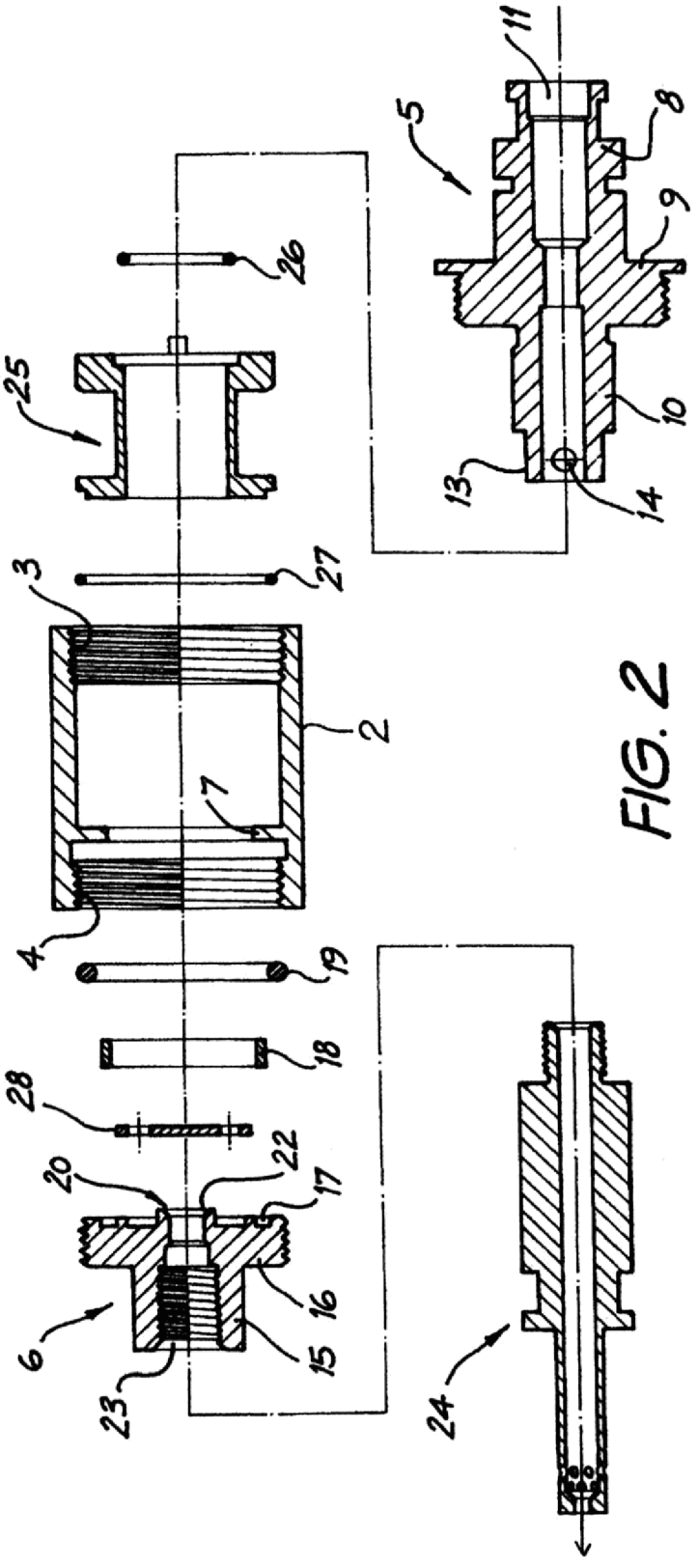


FIG. 2

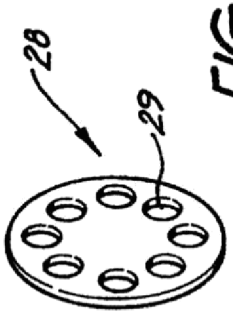
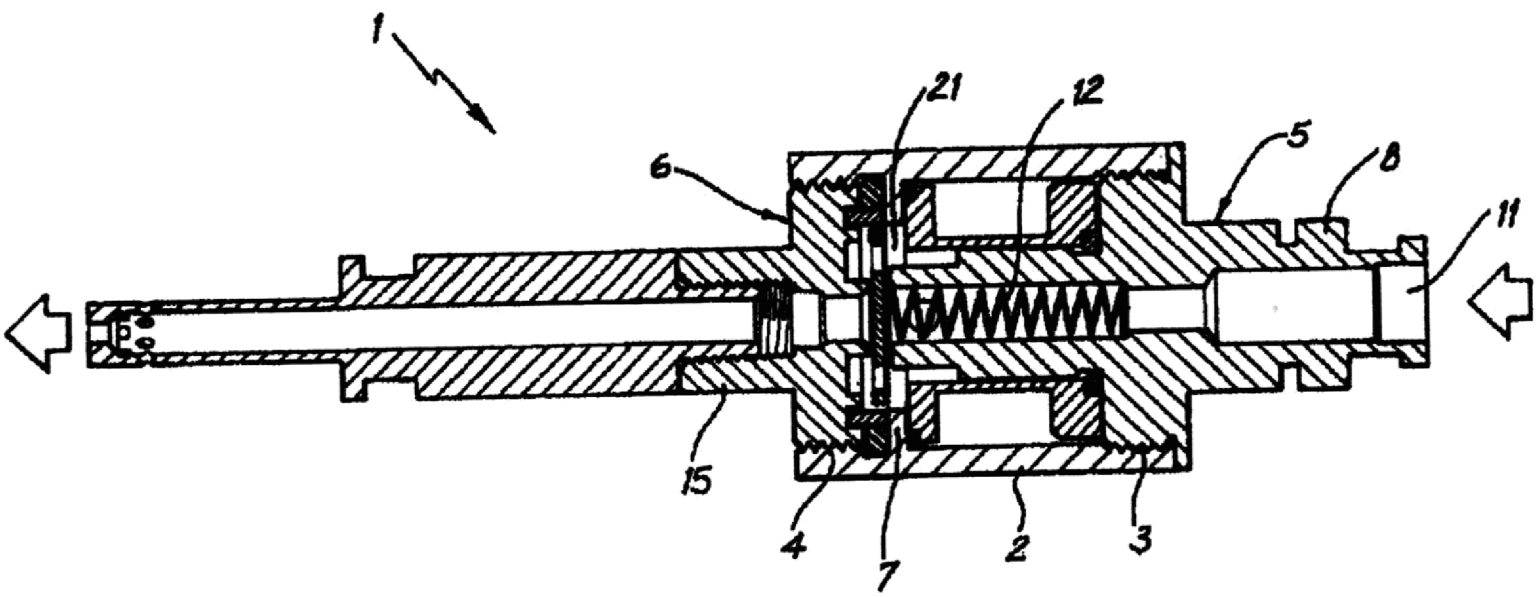


FIG. 3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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 5 :		(11) International Publication Number:	WO 92/07861
C07G 13/00, H03K 3/30	A1	(43) International Publication Date:	14 May 1992 (14.05.92)

(21) International Application Number: PCT/US90/06407

(22) International Filing Date: 2 November 1990 (02.11.90)

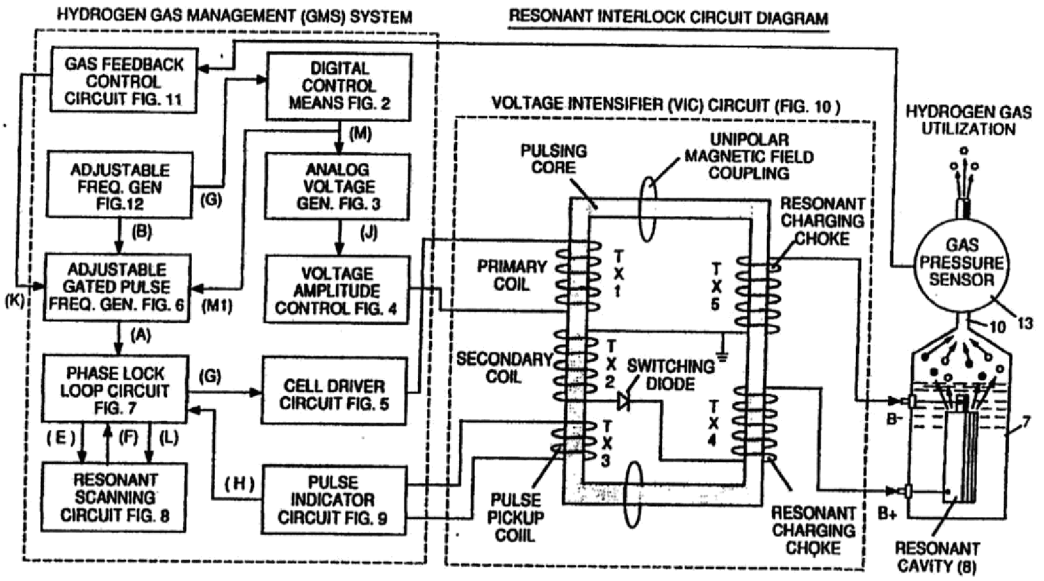
(71)(72) Applicant and Inventor: MEYER, Stanley, A. [US/US]; 3792 Broadway, Grove City, OH 43123 (US).

(74) Agent: BARANOWSKI, Edwin, M.; Porter, Wright, Morris & Arthur, 41 South High Street, Columbus, OH 43215 (US).

(81) Designated States: AT (European patent), AU, BE (European patent), CA, CH (European patent), DE (European patent), DK (European patent), ES, ES (European patent), FR (European patent), GB (European patent), GR (European patent), IT (European patent), JP, KR, LU (European patent), NL (European patent), SE (European patent), US.

Published
With international search report.

(54) Title: A CONTROL AND DRIVER CIRCUITS FOR A HYDROGEN GAS FUEL PRODUCING CELL



(57) Abstract

A control circuit for a capacitive resonant cavity water capacitor cell (7) for the production of a hydrogen containing fuel gas has a resonant scanning circuit cooperating with a resonance detector and PLL circuit to produce pulses. The pulses are fed into the primary (TX1) transformer. The secondary (TX2) transformer is connected to the resonant cavity water capacitor cell (7) via a diode and resonant charging chokes (TX4, TX5).

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CONTROL AND DRIVER CIRCUITS FOR A HYDROGEN GAS FUEL PRODUCING CELL

This invention relates to electrical circuit systems useful in the operation of a water fuel cell including a water capacitor/resonant cavity for the production of a hydrogen containing fuel gas, such as that described in my United States Letter Patent No. 4,936,961, "Method for the Production of a Fuel Gas", issued on June 26, 1990.

In my aforesaid Letters Patent for a method for the production of a fuel gas, voltage pulses applied to plates of a water capacitor tune into the dielectric properties of the water and attenuate the electrical forces between the hydrogen and oxygen atoms of the molecule. The attenuation of the electrical forces results in a change in the molecular electrical field and the covalent atomic bonding forces of the hydrogen and oxygen atoms. When resonance is achieved, the atomic bond of the molecule is broken, and the atoms of the molecule disassociate. At resonance, the current (amp) draw from a power source to the water capacitor is minimized and voltage across the water capacitor increases. Electron flow is not permitted (except at the minimum, corresponding to leakage resulting from the residual conductive properties of water). For the process to continue, however, a resonant condition must be maintained.

Because of the electrical polarity of the water molecule, the fields produced in the water capacitor respectively attract and repel the opposite and like charges in the molecule, and the forces eventually achieved at resonance are such that the strength of the covalent bonding force in the water molecule is exceeded, and the atoms of the water molecule (which are normally in an electron sharing mode) disassociate. Upon disassociation, the formerly shared bonding electrons migrate to the hydrogen nuclei, and both the hydrogen and oxygen revert to net zero electrical charge. The atoms are released from the water as a gas mixture.

In the invention herein, a control circuit for a resonant cavity water capacitor cell utilized for the production of a hydrogen containing fuel gas is provided.

The circuit includes an isolation means such as a transformer having a ferromagnetic, ceramic or other electromagnetic material core and having one side of a secondary coil connected in series with a high speed switching diode to one plate of the water capacitor of the resonant cavity and the other side of the secondary coil connected to the other plate of the water capacitor to form a closed loop electronic circuit utilizing the dielectric properties of water as part of the electronic resonant circuit. The primary coil of the isolation transformer is connected to a pulse generation means. The secondary coil of the transformer may include segments

that form resonant charging choke circuits in series with the water capacitor plates.

In the pulse generation means, an adjustable first, resonant frequency generator and a second gated pulse frequency generator are provided. A gate pulse controls the number of the pulses produced by the resonant frequency generator sent to the primary coil during a period determined by the gate frequency of the second pulse generator.

The invention also includes a means for sensing the occurrence of a resonant condition in the water capacitor/resonant cavity, which when a ferromagnetic or electromagnetic core is used, may be a pickup coil on the transformer core. The sensing means is interconnected to a scanning circuit and a phase lock loop circuit, whereby the pulsing frequency to the primary coil of the transformer is maintained at a sensed frequency corresponding to a resonant condition in the water capacitor.

Control means are provided in the circuit for adjusting the amplitude of a pulsing cycle sent to the primary coil and for maintaining the frequency of the pulsing cycle at a constant frequency regardless of pulse amplitude. In addition, the gated pulse frequency generator may be operatively interconnected with a sensor that monitors the rate of gas production from the cell and controls the number of pulses from the resonant frequency

generator sent to the cell in a gated frequency in a correspondence with the rate of gas production. The sensor may be a gas pressure sensor in an enclosed water capaçitor resonant cavity which also includes a gas outlet. The gas pressure sensor is operatively connected to the circuit to determine the rate of gas production with respect to ambient gas pressure in the water capacitor enclosure.

Thus, an omnibus control circuit and its discrete elements for maintaining and controlling the resonance and other aspects of the release of gas from a resonant cavity water cell is described herein and illustrated in the drawings which depict the following:

Figure 1 is a block diagram of an overall control circuit showing the interrelationship of sub-circuits, the pulsing core/resonant circuit and the water capacitor resonant cavity.

Figure 2 shows a type of digital control means for regulating the ultimate rate of gas production as determined by an external input. (Such a control means would correspond, for example, to the accelerator in an automobile or a building thermostat control.)

Figure 3 shows an analog voltage generator.

Figure 4 is a voltage amplitude control circuit interconnected with the voltage generator and one side of the primary coil of the pulsing core.

Figure 5 is the cell driver circuit that is connected with the opposite side of the primary coil of the pulsing core.

Figures 6, 7, 8 and 9 relate to pulsing control means including a gated pulse frequency generator **(Figure 6)**; a phase lock circuit **(Figure 7)**; a resonant scanning circuit **(Figure 8)**; and the pulse indicator circuit **(Figure 9)** that control pulses transmitted to the resonant cavity/water fuel cell capacitor.

Figure 10 shows the pulsing core and the voltage intensifier circuit that is the interface between the control circuit and the resonant cavity.

Figure 11 is a gas feedback control circuit.

Figure 12 is an adjustable frequency generator circuit.

The circuits are operatively interconnected as shown in Figure 1 and to the pulsing core voltage

intensifier circuit of Figure 10, which, inter alia, electrically isolates the water capacitor so that it becomes an electrically isolated cavity for the processing of water in accordance with its dielectric resonance properties. By reason of the isolation, power consumption in the control and driving circuits is minimized when resonance occurs; and current demand is minimized as voltage is maximized in the gas production mode of the water capacitor/fuel cell.

The reference letters appearing in the Figures, A, B, C, D, E, etc., to M and M1 show, with respect to each separate circuit depicted, the point at which a connection in that circuit is made to a companion or interrelated circuit.

In the invention, the water capacitor is subjected to a duty pulse which builds up in the resonant changing choke coil and then collapses. This occurrence permits a unipolar pulse to be applied to the fuel cell capacitor. When a resonant condition of the circuit is locked-in by the circuit, amp leakage is held to a minimum as the voltage which creates the dielectric field tends to infinity. Thus, when high voltage is detected upon resonance, the phase lock loop circuit that controls the cell driver circuit maintains the resonance at the detected (or sensed) frequency.

The resonance of the water capacitor cell is affected by the volume of water in the cell. The

resonance of any given volume of water maintained in the water capacitor cell is also affected by "contaminants" in the water which act as a damper. For example, at an applied potential difference of 2000 to 5000 volts to the cell, an amp spike or surge may be caused by inconsistencies in water characteristics that cause an out-of-resonance condition which is remedied instantaneously by the control circuits.

In the invention, the adjustable frequency generator (Figure 12) tunes into the resonant condition of the circuit including the water cell and the water therein. The generator has a frequency capability of 0 - 10 KHz and tunes into resonance typically at a frequency of 5 KHz in a typical 3.0 inch water capacitor formed of a 0.5 inch rod enclosed within a 0.75 inside diameter cylinder. At start up, in this example, current draw through the water cell will measure about 25 milliamp; however, when the circuit finds a tuned resonant condition, current drops to a 1-2 milliamp minimum leakage condition.

The voltage to the capacitor water cell increases according to the turns of the winding and size of the coils, as in a typical transformer circuit. For example, if 12 volts are sent to the primary coil of the pulsing core and the secondary coil resonant charging choke ratio is 30 to 1, then 360 volts are sent to the capacitor water

cell. Turns are a design variable that control the voltage of the unipolar pulses sent to the capacitor.

The high speed switching diode shown in Figure 10 prevents charge leakage from the charged water in the water capacitor cavity, and the water capacitor as an overall capacitor circuit element, i.e., the pulse and charge status of the water/capacitor never pass through an arbitrary ground. The pulse to the water capacitor is always unipolar. The water capacitor is electrically isolated from the control, input and driver circuits by the electromagnetic coupling through the core. The switching diode in the VIC circuit (Figure 10) performs several functions in the pulsing. The diode is an electronic switch that determines the generation and collapse of an electromagnetic field to permit the resonant charging choke(s) to double the applied frequency and also allows the pulse to be sent to the resonant cavity without discharging the "capacitor" therein. The diode, of course, is selected in accordance with the maximum voltage encountered in the pulsing circuit. A 600 PIV fast switching diode, such as an NVR 1550 high speed switching diode, has been found to be useful in the circuit herein.

The VIC circuit of Figure 10 also includes a ferromagnetic or ceramic ferromagnetic pulsing core capable of producing electromagnetic flux lines in response to an electrical pulse input. The flux lines

equally affect the secondary coil and the resonant charging choke windings. Preferably, the core is a closed loop construction. The effect of the core is to isolate the water capacitor and to prevent the pulsing signal from going below an arbitrary ground and to maintain the charge of the already charged water and water capacitor.

In the pulsing core, the coils are preferably wound in the same direction to maximize the additive effect of the electromagnetic field therein.

The magnetic field of the pulsing core is in synchronization with the pulse input to the primary coil. The potential from the secondary coil is introduced to the resonant charging choke(s) series circuit elements which are subjected to the same synchronous applied electromagnetic field, simultaneously with the primary pulse.

When resonance occurs, control of the gas output is achieved by varying voltage amplitude or varying the time of duty gate cycle. The transformer core is a pulse frequency doubler. In a figurative explanation of the workings of the fuel gas generator water capacitor cell, when a water molecule is "hit" by a pulse, electron time share is affected, and the molecule is charged. When the time of the duty cycle is changed, the number of pulses that "hit" the molecules in the fuel cell is correspondingly modified. More "hits" result in a greater rate of molecular disassociation.

With reference to the overall circuit of Figure 1, Figure 3 receives a digital input signal, and Figure 4 depicts the control means that directs 0-12 volts across the primary coil of the pulsing core. Depending upon design parameters of primary coil voltage and other factors relevant to core design, the secondary coil of the pulsing core can be set up for a predetermined maximum, such as 2000 volts.

Figure 5, the cell driver circuit, allows a gated pulse to be varied in direct relation to voltage amplitude.

As noted above, the circuit of Figure 6 produces a gate pulse frequency. The gate pulse is superimposed over the resonant frequency pulse to create a duty cycle that determines the number of discrete pulses sent to the primary coil. For example, assuming a resonant pulse of 5 KHz, a .5 Hz gate pulse may be superimposed over the 5 KHz pulse to provide 2500 discrete pulses in a 50% duty cycle per Hz. The relationship of resonant pulse to the gate pulse is determined by conventional signal addition/subtraction techniques.

Figure 7, a phase lock loop, allows pulse frequency to be maintained at a predetermined resonant condition sensed by the circuit. Together, the circuits of Figures 7 and 8 determine an output signal to the pulsing core until the peak voltage signal sensed at resonance is achieved.

A resonant condition occurs when the pulse frequency and the voltage input attenuates the covalent bonding forces of the hydrogen and oxygen atoms of the water molecule. When this occurs, amp leakage through the water capacitor is minimized. The tendency of voltage to maximize at resonance increases the force of the electric potential applied to the water molecules, which ultimately disassociate into atoms.

Because resonances of different waters, water volumes, and capacitor cells vary, the resonant scanning circuit of Figure 8 is useful. The scanning circuit of Figure 8 scans frequency from high to low to high repeating until a signal lock is determined. The ferromagnetic core of the voltage intensifier circuit transformer suppresses electron surge in an out-of-resonance condition of the fuel cell. In an example, the circuit scans at frequencies from 0 Hz to 10 KHz to 0 Hz. In water having contaminants in the range of 1 ppm to 20 ppm, a 20% variance in resonant frequency is encountered. Depending on water flow rate into fuel cell, the normal variance range is about 8-10%. For example, iron in well water affects the status of molecular disassociation. Also, at a resonant condition harmonic effects occur. In a typical operation of the cell with a representative water capacitor described below, at a frequency of about 5 KHz at unipolar pulses from 0 to 650 volts at a sensed resonant condition into the resonant

cavity, conversion of about 5 gallons of water per hour into a fuel gas will occur on average. To increase the rate, multiple resonant cavities can be used and/or the surfaces of the water capacitor can be increased, however, the water capacitor cell is preferably small in scale. A typical water capacitor may be formed from a 0.5 inch in diameter stainless steel rod and a 0.75 inch inside diameter cylinder that together extend concentrically about 3.0 inches with respect to each other.

Shape and size of the resonant cavity may vary. Larger resonant cavities and higher rates of consumption of water in the conversion process require higher frequencies such as up to 50 KHz and above. The pulsing rate, to sustain such high rates of conversion must be correspondingly increased.

From the foregoing description of the preferred embodiment, other variations and modifications of the system disclosed will be evident to those of skill in the art.

WHAT IS CLAIMED IS:

1. A control circuit for a resonant cavity water capacitor cell utilized for the production of a hydrogen containing fuel gas including

an isolation transformer including a ferromagnetic core and having one side of a secondary coil connected in series with a high speed switching diode to one plate of the water capacitor of the resonant cavity and the other side of the secondary coil connected to the other plate of the water capacitor to form a closed loop electronic circuit utilizing the dielectric properties of water as part of the electronic circuit and a primary coil connected to a pulse generation means.

2. The circuit of Claim 1 in which the secondary coil includes segments that form a resonant charging choke circuit in series with the water capacitor.

3. The circuit of Claim 1 in which the pulse generation means includes an adjustable first frequency generator and a second gated pulse frequency generator which controls the number of pulses produced by the first frequency generator sent to the primary coil during a period determined by the gate frequency of the second pulse generator.

4. The circuit of Claim 1 further including a means for sensing the occurrence of a resonant condition in the water capacitor of the resonant cavity.

5. The circuit of Claim 4 in which the means for sensing is a pickup coil on the ferromagnetic core of the transformer.

6. The circuit of Claim 4 or Claim 5 in which the sensing means is interconnected to a scanning circuit and a phase lock loop circuit, whereby the pulsing frequency to the primary coil of the transformer is maintained at a sensed frequency corresponding to a resonant condition in the water capacitor.

7. The circuit of Claim 1 including means for adjusting the amplitude of a pulsing cycle sent to the primary coil.

8. The circuit of Claim 6 including further means for maintaining the frequency of the pulsing cycle at a constant frequency regardless of pulse amplitude.

9. The circuit of Claim 3 in which the gated pulse frequency generator is operatively interconnected with a sensor that monitors the rate of gas production from the cell and controls the number of pulses to the

cell in a gated frequency in a correspondence with the rate of gas production.

10. The circuit of Claim 7 or Claim 8 or Claim 9 further including a gas pressure sensor in an enclosed water capacitor resonant cavity which also includes a gas outlet, which gas pressure sensor is operatively connected to the circuit to determine the rate of gas production with respect to ambient gas pressure in the water capacitor enclosure.

11. The methods and apparatus as substantially described herein.

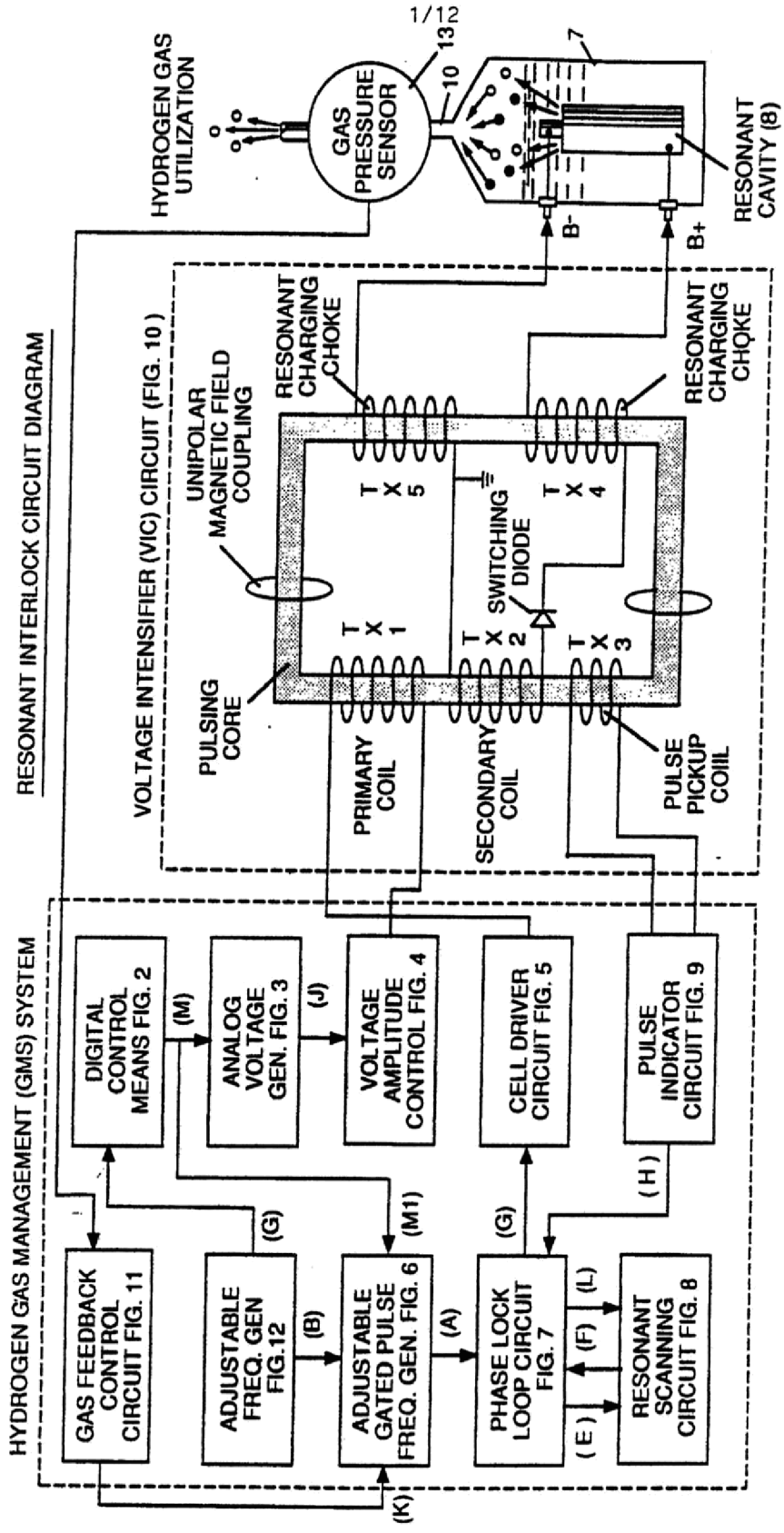
1/12
HYDROGEN GAS UTILIZATION
GAS PRESSURE SENSOR
13
10
7
RESONANT CAVITY (8)
B-
B+
RESONANT INTERLOCK CIRCUIT DIAGRAM
VOLTAGE INTENSIFIER (VIC) CIRCUIT (FIG. 10)
UNIPOLAR MAGNETIC FIELD COUPLING
RESONANT CHARGING CHOKE
RESONANT CHARGING CHOKE
PULSING CORE
PRIMARY COIL
SECONDARY COIL
PULSE PICKUP COIL
SWITCHING DIODE
TX1
TX2
TX3
TX4
TX5
HYDROGEN GAS MANAGEMENT (GMS) SYSTEM
DIGITAL CONTROL MEANS FIG. 2
ANALOG VOLTAGE GEN. FIG. 3
VOLTAGE AMPLITUDE CONTROL FIG. 4
CELL DRIVER CIRCUIT FIG. 5
PULSE INDICATOR CIRCUIT FIG. 9
GAS FEEDBACK CONTROL CIRCUIT FIG. 11
ADJUSTABLE FREQ. GEN FIG.12
ADJUSTABLE GATED PULSE FREQ. GEN. FIG. 6
PHASE LOCK LOOP CIRCUIT FIG. 7
RESONANT SCANNING CIRCUIT FIG. 8
(M)
(J)
(G)
(M1)
(G)
(H)
(B)
(A)
(F)
(L)
(E)
(K)

FIGURE 1

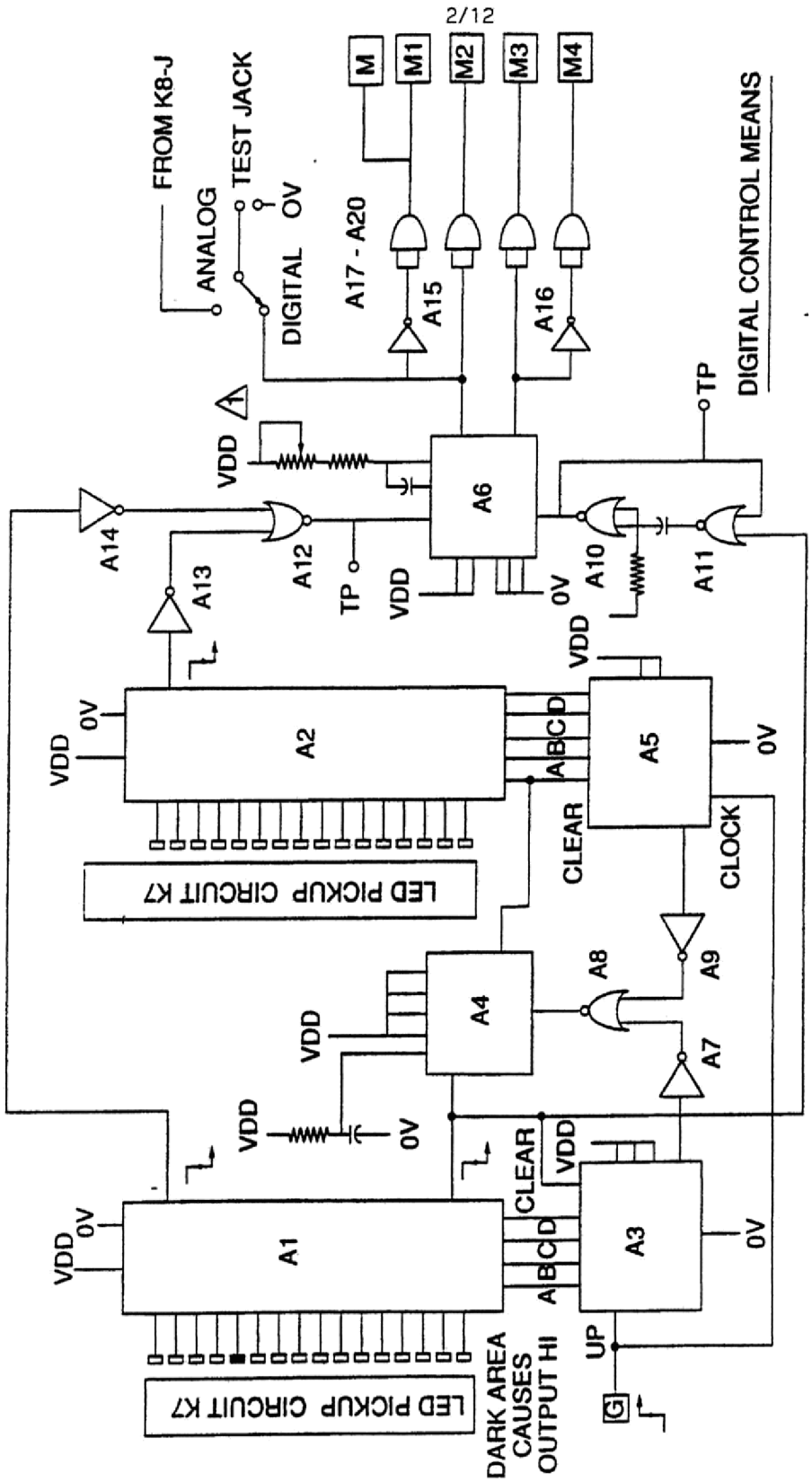
FROM K8-J
ANALOG
TEST JACK
DIGITAL
OV
M
M1
M2
M3
M4
A17 - A20
A15
A16
DIGITAL CONTROL MEANS
TP
VDD
A6
A14
A12
A13
A10
A11
0V
A2
A5
A
B
C
D
CLEAR
CLOCK
LED PICKUP CIRCUIT K7
A4
A8
A9
A7
A1
A3
UP
G
DARK AREA CAUSES OUTPUT HI
ON CARD MOUNTING

FIGURE 2

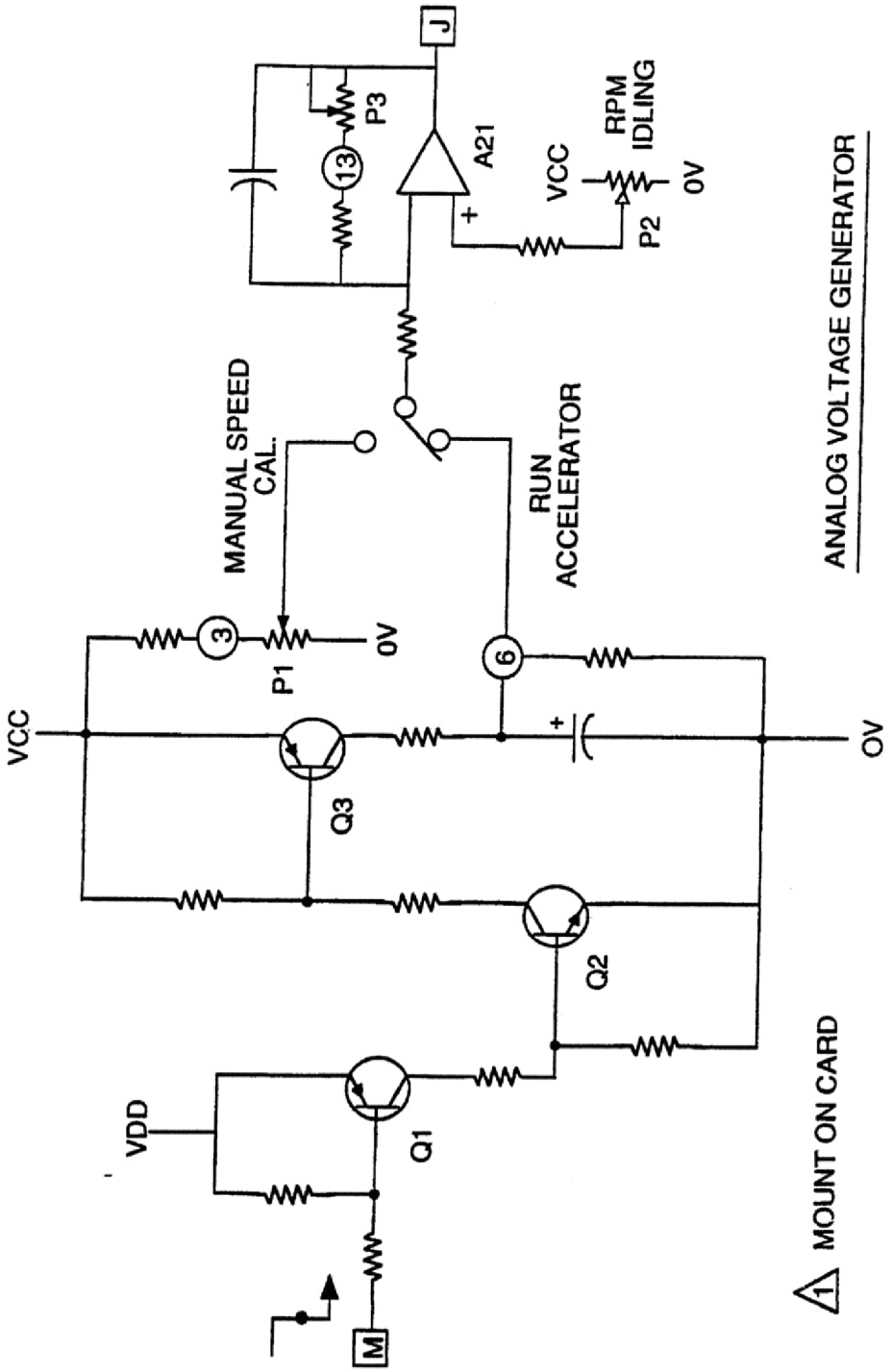
J
P3
13
A21
VCC
RPM IDLING
0V
P2
MANUAL SPEED CAL.
RUN ACCELERATOR
ANALOG VOLTAGE GENERATOR
3
P1
0V
6
VCC
0V
Q3
Q2
VDD
Q1
M
1 MOUNT ON CARD

FIGURE 3

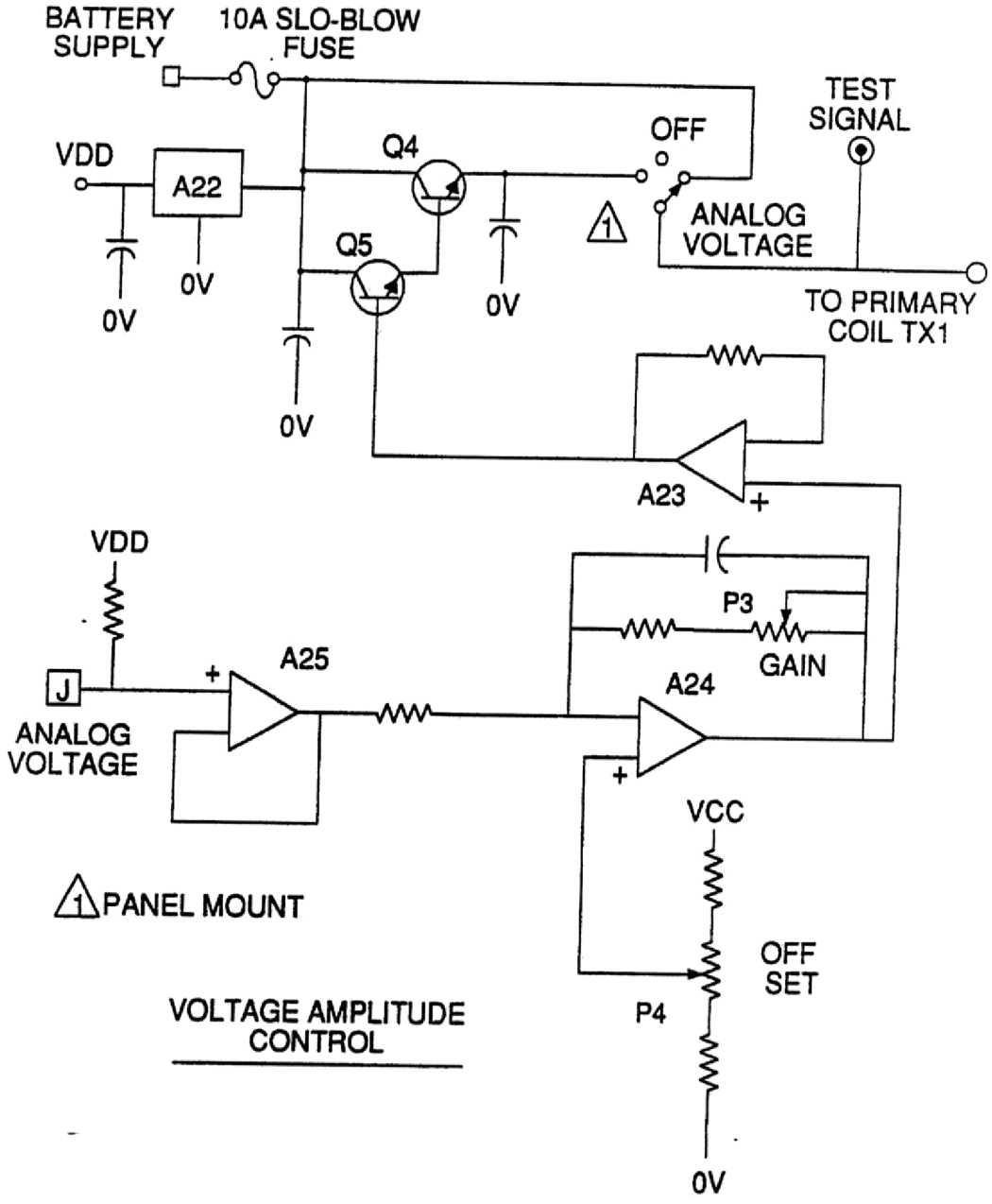
BATTERY SUPPLY
10A SLO-BLOW FUSE
TEST SIGNAL
OFF
VDD
A22
Q4
Q5
ANALOG VOLTAGE
TO PRIMARY COIL TX1
0V
A23
VDD
P3
GAIN
A25
A24
J
ANALOG VOLTAGE
VCC
PANEL MOUNT
OFF SET
P4
VOLTAGE AMPLITUDE CONTROL

FIGURE 4

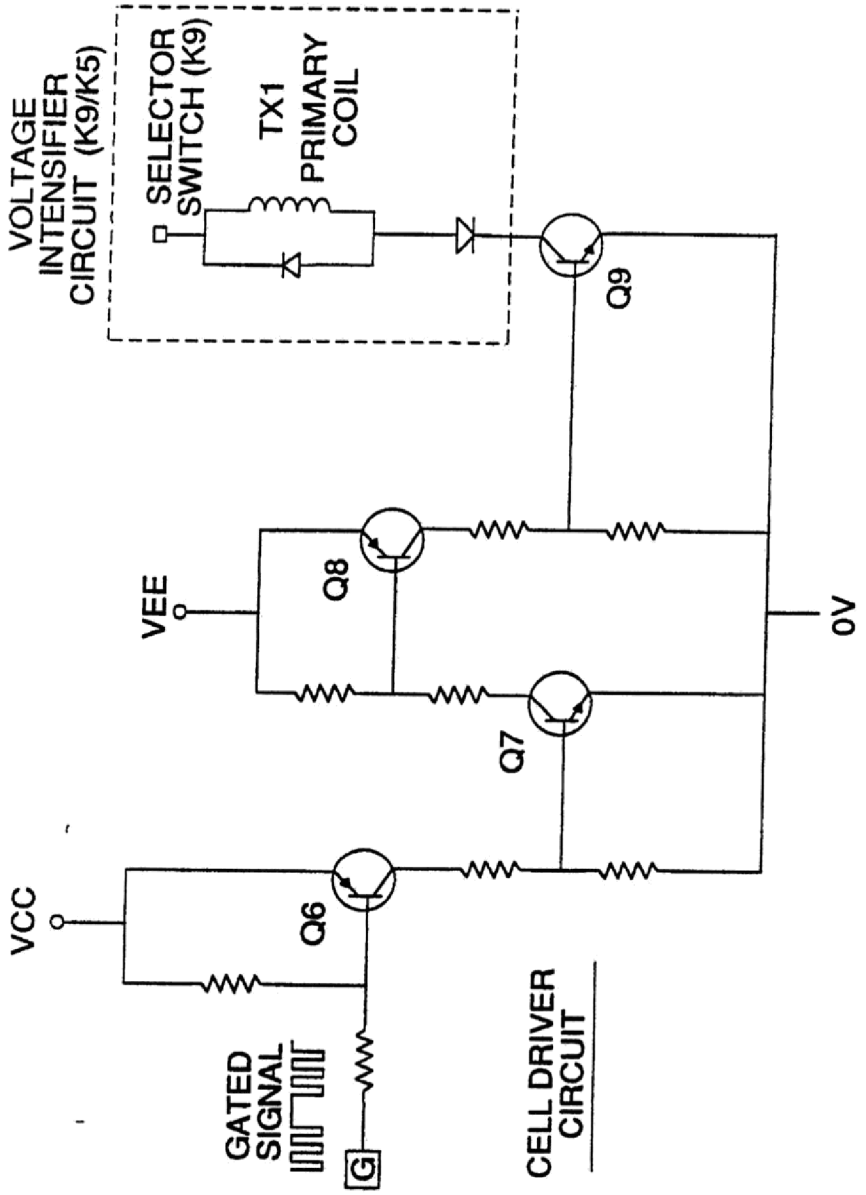
VOLTAGE INTENSIFIER CIRCUIT (K9/K5)
SELECTOR SWITCH (K9)
TX1 PRIMARY COIL
Q9
Q8
VEE
0V
Q7
VCC
Q6
GATED SIGNAL
G
CELL DRIVER CIRCUIT

FIGURE 5

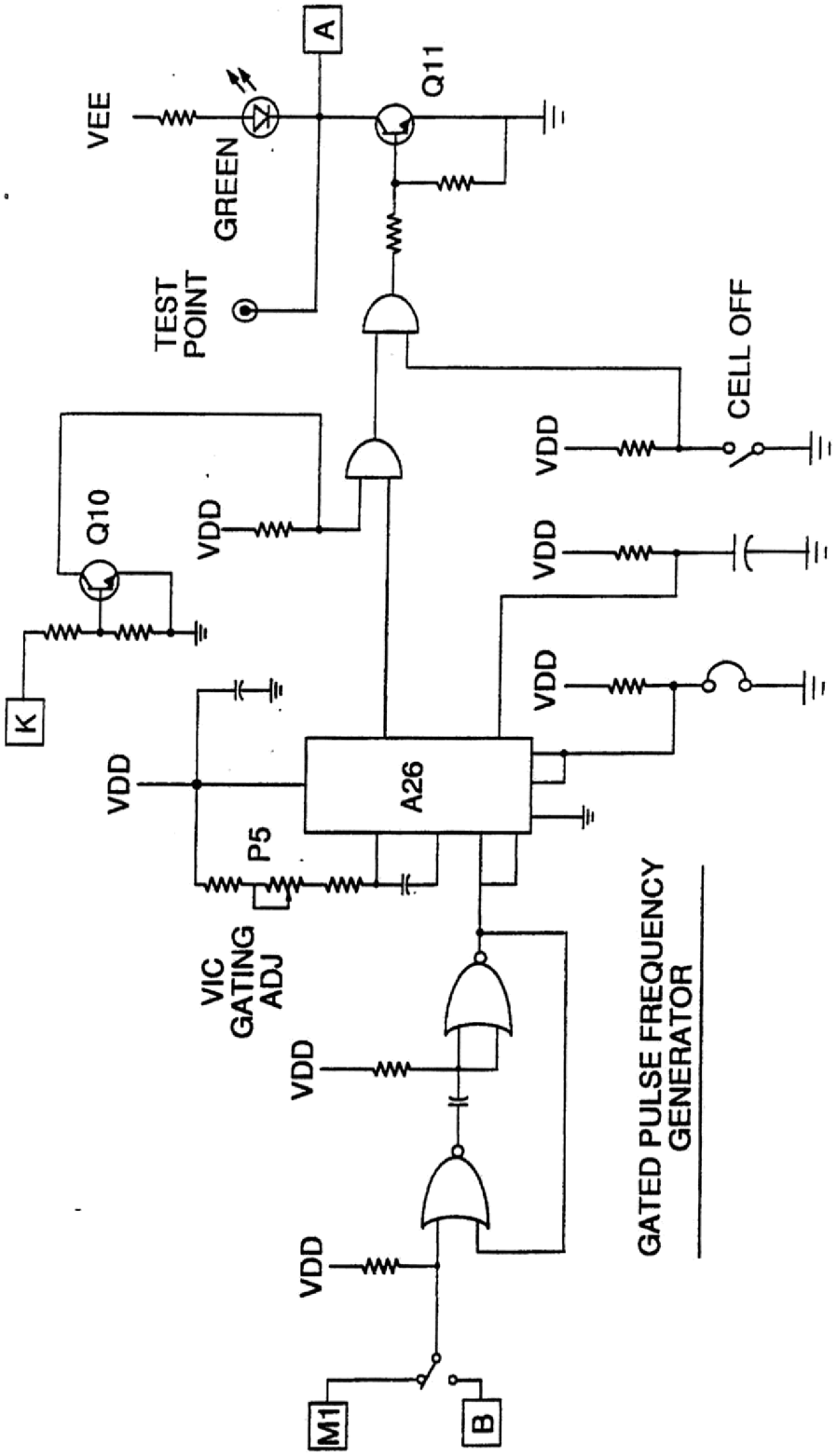
A
VEE
GREEN
Q11
TEST POINT
CELL OFF
VDD
Q10
VDD
VDD
VDD
K
VDD
A26
P5
VIC GATING ADJ
VDD
VDD
M1
B
GATED PULSE FREQUENCY GENERATOR

FIGURE 6

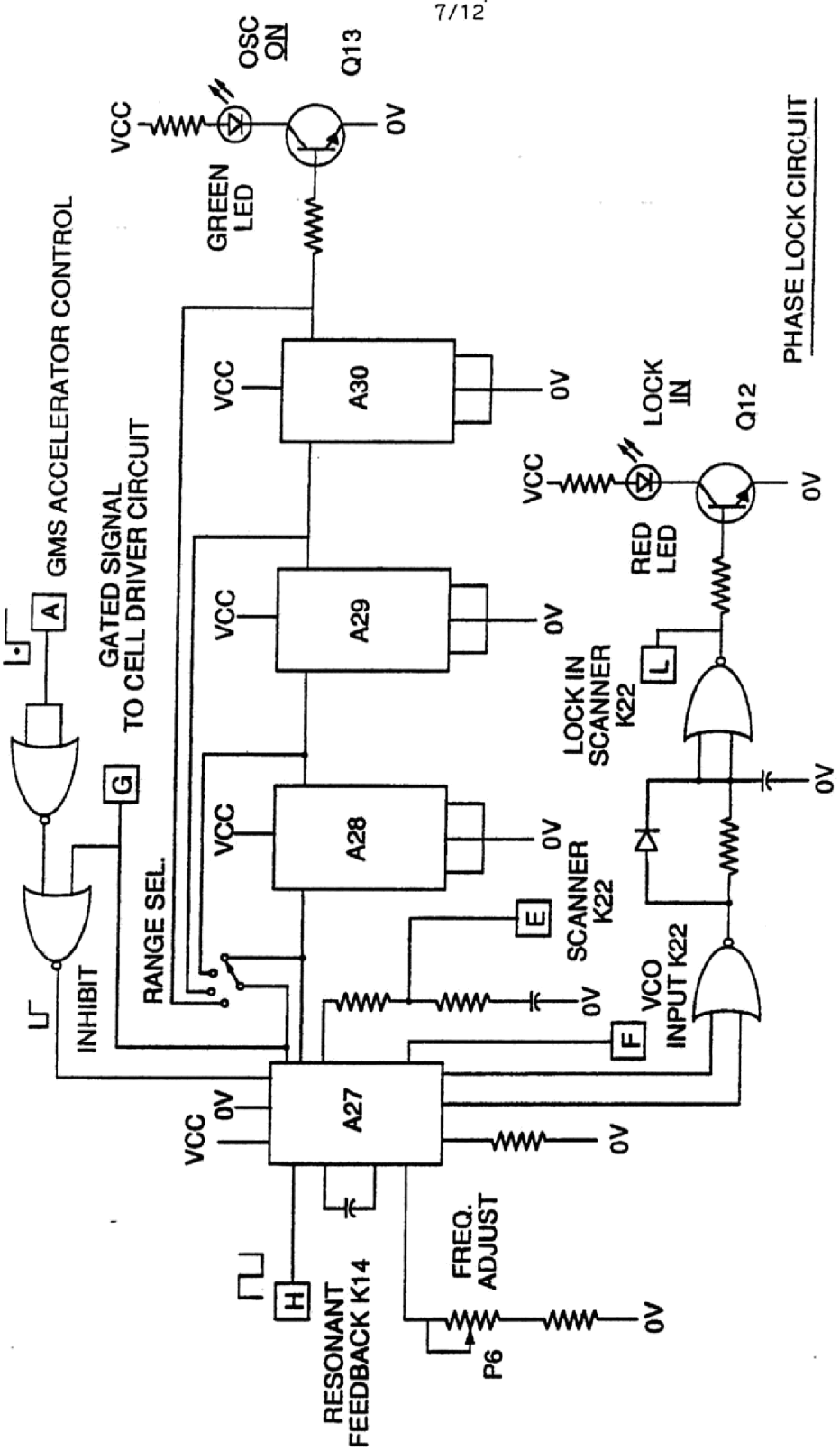
OSC ON
Q13
VCC
0V
GREEN LED
PHASE LOCK CIRCUIT
LOCK IN
Q12
RED LED
GMS ACCELERATOR CONTROL
A
GATED SIGNAL TO CELL DRIVER CIRCUIT
G
INHIBIT
RANGE SEL.
A30
A29
A28
A27
LOCK IN SCANNER K22
L
SCANNER K22
E
VCO INPUT K22
F
FREQ. ADJUST
P6
RESONANT FEEDBACK K14
H

FIGURE 7

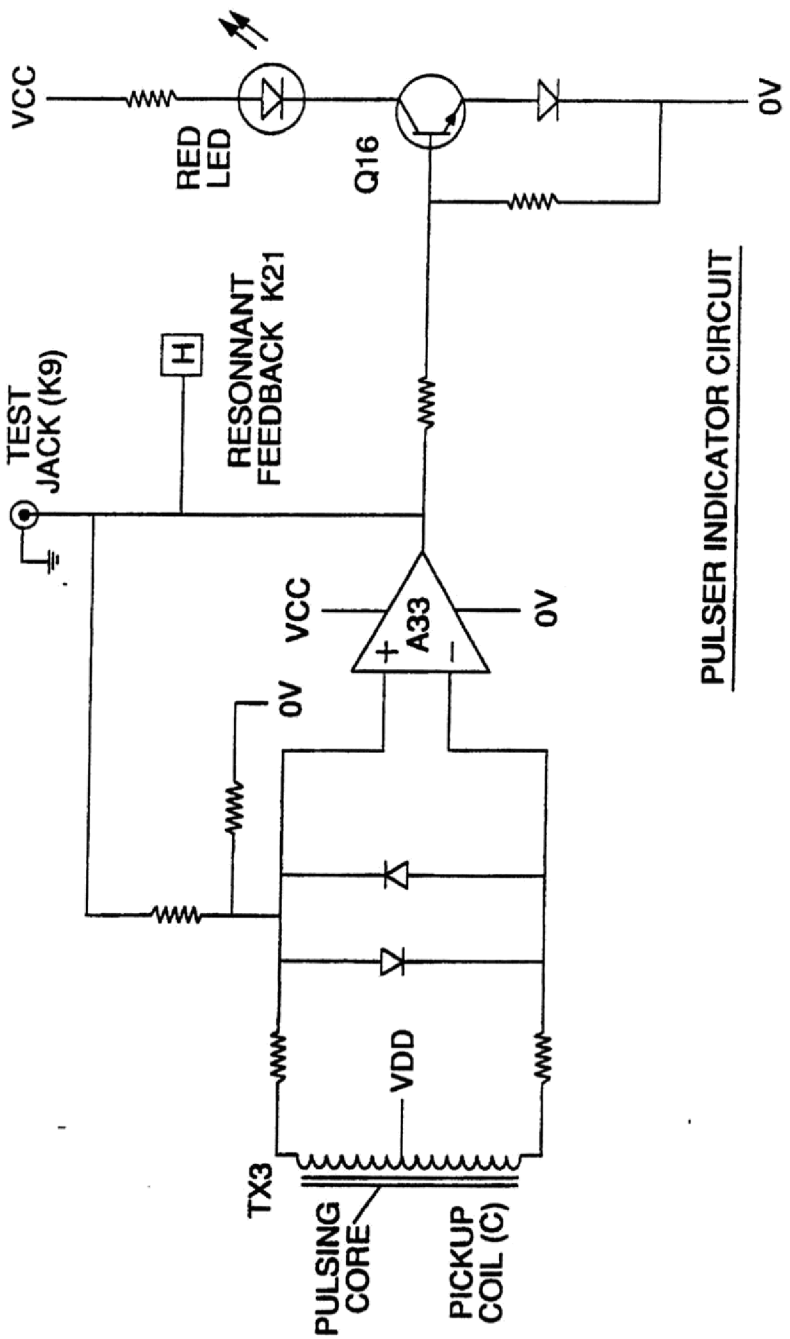
VCC
RED LED
Q16
0V
TEST JACK (K9)
H
RESONANT FEEDBACK K21
PULSER INDICATOR CIRCUIT
VCC
A33
0V
0V
VDD
TX3
PULSING CORE
PICKUP COIL (C)

FIGURE 9

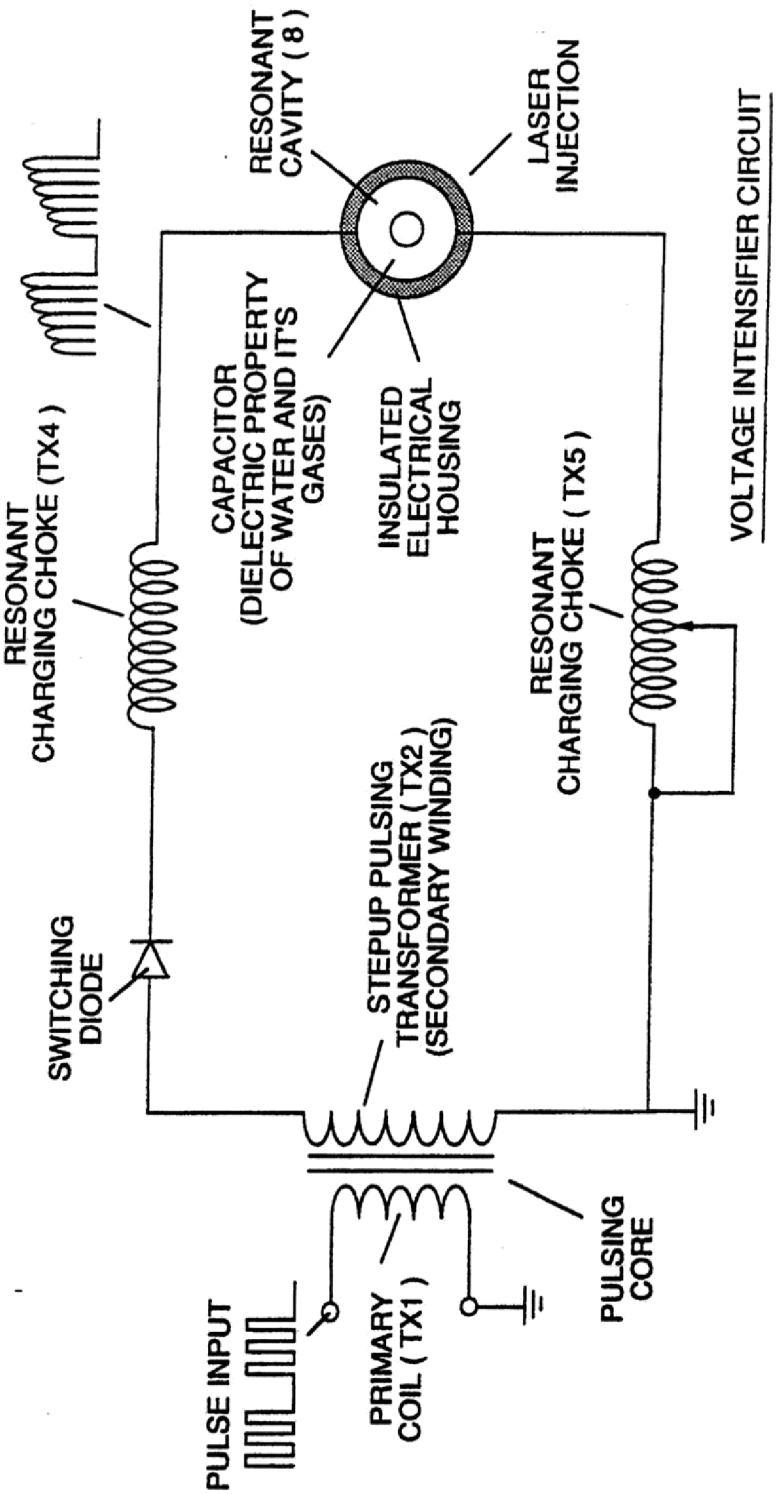
RESONANT CAVITY (8)
LASER INJECTION
VOLTAGE INTENSIFIER CIRCUIT
RESONANT CHARGING CHOKE (TX4)
CAPACITOR (DIELECTRIC PROPERTY OF WATER AND IT'S GASES)
INSULATED ELECTRICAL HOUSING
RESONANT CHARGING CHOKE (TX5)
SWITCHING DIODE
STEPUP PULSING TRANSFORMER (TX2) (SECONDARY WINDING)
PULSE INPUT
PRIMARY COIL (TX1)
PULSING CORE

FIGURE 10

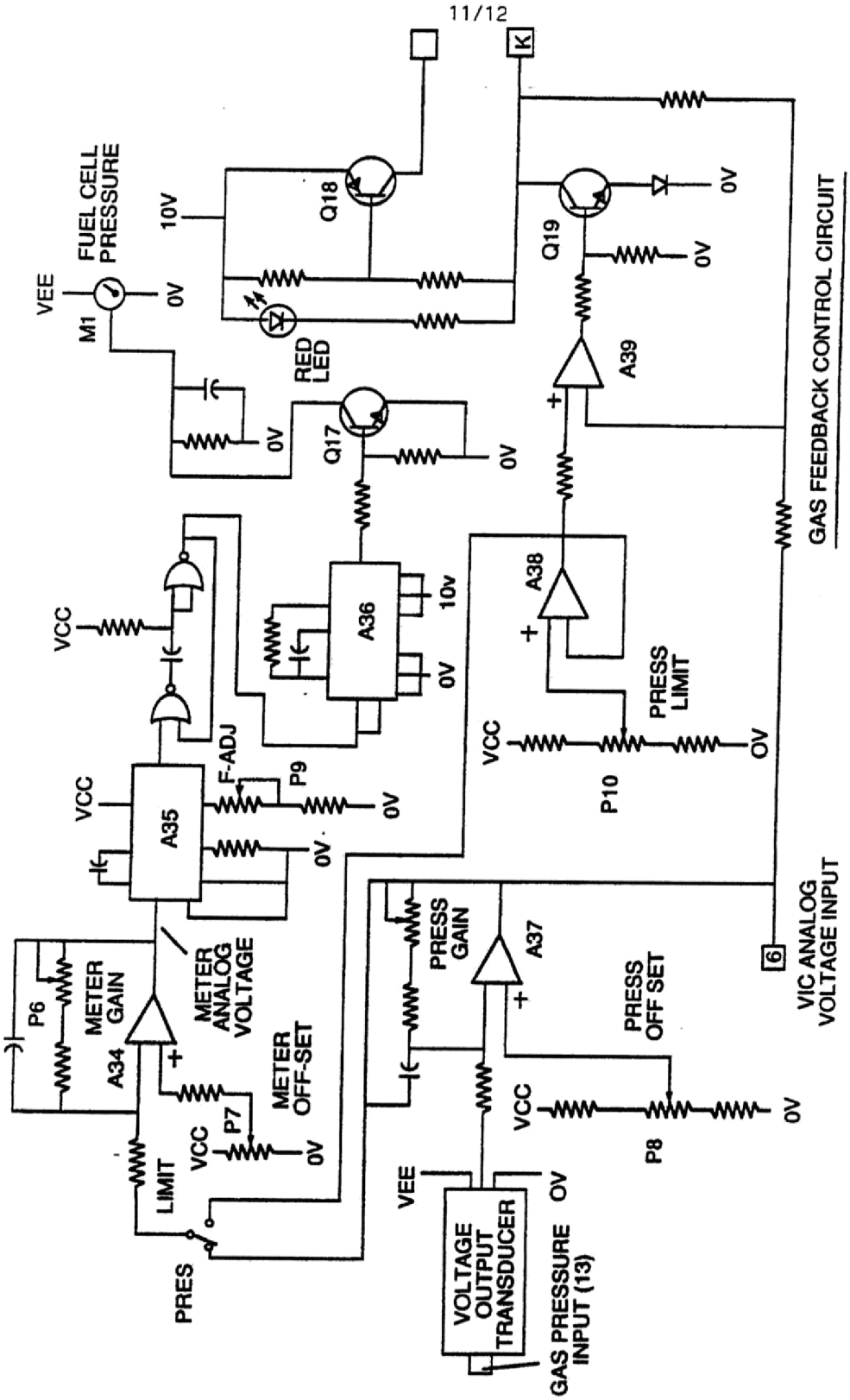
K
FUEL CELL PRESSURE
VEE
M1
0V
10V
Q18
Q19
0V
0V
RED LED
A39
Q17
0V
0V
GAS FEEDBACK CONTROL CIRCUIT
VCC
A36
10v
0V
A38
PRESS LIMIT
VCC
0V
P10
F-ADJ
P9
VCC
A35
0V
0V
PRESS GAIN
A37
PRESS OFF SET
6
VIC ANALOG VOLTAGE INPUT
P6
METER GAIN
A34
METER ANALOG VOLTAGE
METER OFF-SET
P7
VCC
0V
LIMIT
VCC
P8
0V
VEE
0V
PRES
VOLTAGE OUTPUT TRANSDUCER
GAS PRESSURE INPUT (13)

FIGURE 11

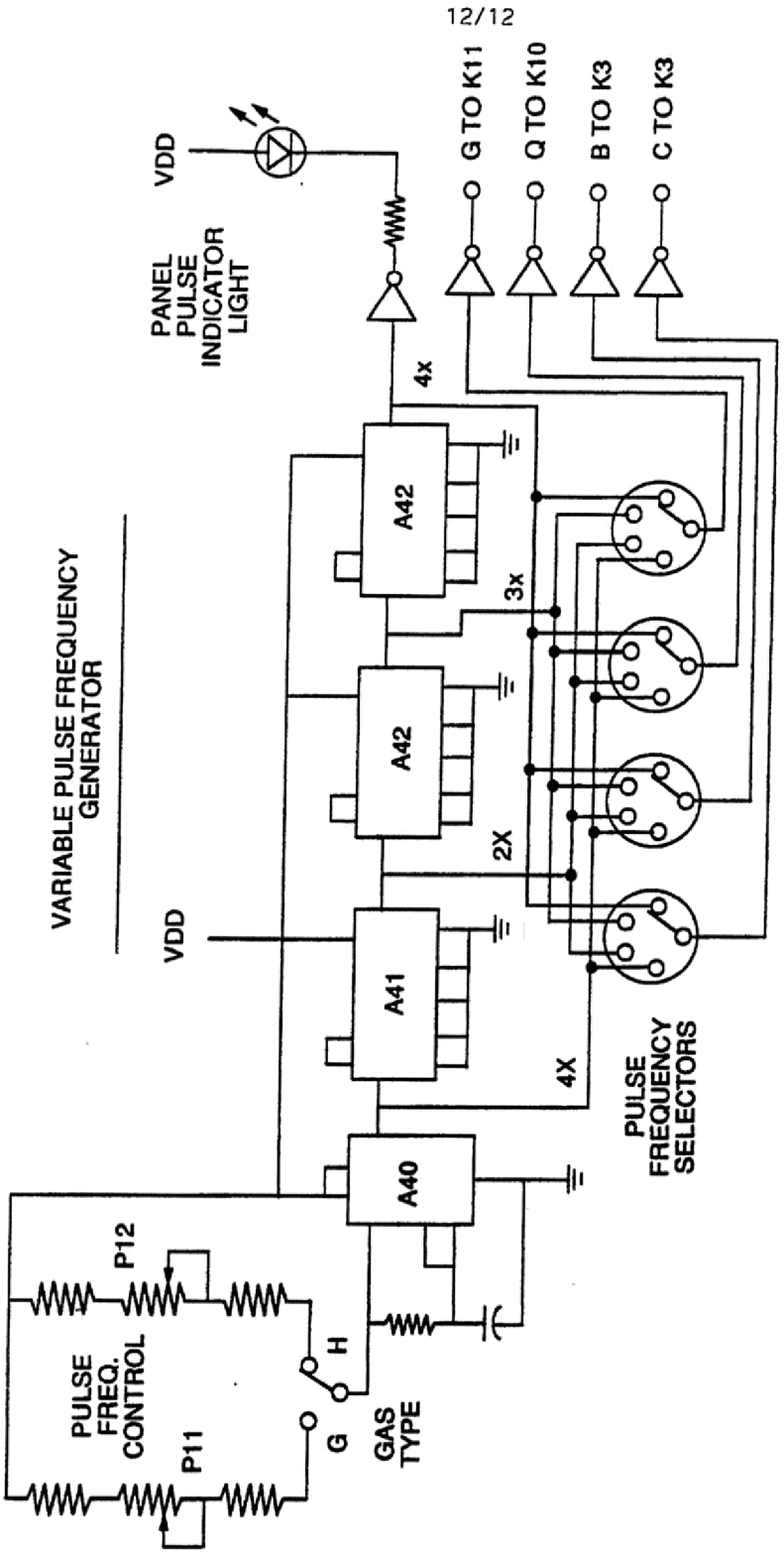
G TO K11
Q TO K10
B TO K3
C TO K3
VDD
PANEL PULSE INDICATOR LIGHT
4x
A42
3x
A42
2X
VDD
A41
4X
A40
PULSE FREQUENCY SELECTORS
VARIABLE PULSE FREQUENCY GENERATOR
P12
PULSE FREQ. CONTROL
P11
H
G
GAS TYPE

FIGURE 12

INTERNATIONAL SEARCH REPORT

International Application No PCT/US90/06407

I. CLASSIFICATION OF SUBJECT MATTER (if several classification symbols apply, indicate all) [3]

According to International Patent Classification (IPC) or to both National Classification and IPC

IPC(5) . C07G 13/00, H03K 3/30
US CL : 204/157.52, 331/4, 307/106

II. FIELDS SEARCHED

Minimum Documentation Searched [4]

Classification System	Classification Symbols
US CL	204/157.42, 157.52; 422/186.16; 331/4,47,178, 307/106-109,271,282

Documentation Searched other than Minimum Documentation to the Extent that such Documents are Included in the Fields Searched [5]

III. DOCUMENTS CONSIDERED TO BE RELEVANT [14]

Category *	Citation of Document, [16] with indication, where appropriate, of the relevant passages [17]	Relevant to Claim No. [18]
X Y	US, A, 4,936,961 (MEYER) 26 JUNE 1990 SEE FIGURES 1,2	1-3,7 4,6
Y	US, A, 4,275,363 (MISHIRO ET AL.) 23 JUNE 1981. SEE FIGURE 1.	4,6

* Special categories of cited documents: [15]

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier document but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art.

"&" document member of the same patent family

IV. CERTIFICATION

Date of the Actual Completion of the International Search [2]	Date of Mailing of this International Search Report [2]
12 APRIL 1991	07 MAY 1991
International Searching Authority [1]	Signature of Authorized Officer [20]
ISA/US	for DAVID A. OSBORN

Form PCT/ISA/210 (second sheet) (May 1986)

METHOD AND CIRCUIT FOR DRIVING ULTRASONICCWAVE CONVERTER

Patent number: JP56010792
Publication date: 1981-02-03
Inventor: MISHIRO SHIYOUJI; HAMADA SEISHI
Applicant: TAGA DENKI KK
Classification:
- international: H04R1/00
- european: B06B1/02D3C2B; H03L7/12
Application number: JP19790085033 19790706
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Abstract of **JP56010792**

PURPOSE:To prevent malfunction at a subresonance point by making a generated frequency sweep over a frequency range wider than the tracking range of a phase- fixed loop and by stopping the sweep by detecting the resonance point of an ultrasonic-wave converter during the sweep. CONSTITUTION:Ultrasonic-wave converter 1 is connected to phase-fixed loop 2 composed of a PLL tracking circuit and this fixed loop 2 is provided with voltage control oscillator 3, amplifier 4 and phase comparator 5. Resonance-point detector 6 is connected to amplifier 4 of this fixed loop 2, and detector 6 to the reset terminal of FF7; and sweep circuit 8 is connected between the output terminal of FF7 and oscillator 3, and upper and lower limit detector 9 between the set terminal of FF7 and comparator 5. Then, an oscillation frequency is made to sweep over a frequency range wider than the tracking range of fixed loop 2 and during this sweep, the resonance point of converter 1 is detected to stop the sweep, thereby preventing malfunction at subresonance point.