Fuel vaporizer
heats the mix to cut emissions

By DAVID SCOTT

How do you get an auto engine to give fuel economy and low emissions without sacrificing power and driveability? One way is to make sure that the fuel is completely blended with air when the mix leaves the carburetor. VaPipe, a device designed by Shell Research in England, does just this.

The VaPipe is a hang-on with no moving parts. It uses exhaust heat to vaporize the fuel completely, so a fully homogeneous mixture is fed to the engine.

With fully vaporized fuel, you get smooth running, using a fuel mixture substantially leaner than the normal 18:1 ratio. And you get more even combustion, since there are no heavy drops of liquid gas unbalancing the charge of fuel fed to each cylinder.

A lean mixture, better combustion—these are the keys to lower fuel consumption. Shell reports that Vapipe fitted to different engines in cars and test beds have brought a fuel-economy improvement of 10 percent or greater.

The lean-burn feature also lowers emissions; so does the more complete combustion, which reduces the amount of unburned fuel in the exhaust. Shell claims a dramatic 70- to 80-percent drop in all categories of pollutants. Another benefit claimed is much faster warm-up, which cuts those troublesome emissions after cold starts.

How does VaPipe deliver all these benefits? It's really just a highly refined version of the conventional hot spot at the joint between the intake and exhaust manifold. There, heat riser valves funnel exhaust heat to the intake manifold, warming the fuel-air mix to speed start-up and to help atomize fuel droplets at idle speeds. But manifold heat controls are closed under full-power conditions, leaving the job of vaporization to be done by engine heat alone.

By contrast, the Shell device gives total vaporization over the engine's entire speed and load range, and is self-adjusting to maintain the optimum temperature for each condition. Basically, the VaPipe has two parts—(1) a vaporizer housing small, steam-heated pipes, which extend into (2) a boiler. The whole unit fits between the carburetor and the intake manifold. Gas droplets, speeding through on their way to the manifold, bump into the matrix of hot pipes and are rapidly vaporized (see diagram).

As often happens with sound ideas, some penalties go with the gains. The heated mix expands, causing a marginal drop in the engine's volumetric efficiency, which lowers power output a bit. And you need a higher-octane gas with the VaPipe. But these drawbacks could be offset by the benefits of fuel economy and low emissions.

Will you find a VaPipe on the next car you buy? It's possible—several European and Japanese manufacturers are testing the device.
Simple Humidity Device
Saves Gas; Eases Emissions

THERE are nearly 100 million cars and trucks operating in North America, and no matter what is invented for the future, those vehicles will continue operating for several years. This means our denizens of the highways will continue polluting and guzzling fuel at the same pace which has caused our present day fuel shortage and outrageously inflated costs.

An invention that improves fuel economy and at the same time helps curb noxious exhaust emissions is needed.

NEWSREAL reports on two such devices -- and they would work well together. One is the electronic device invented by Ben Polo on pages 23 and 24 and the other is the Power Pak, a device invented and developed by Charlie Brown and Robert Whippley of Florida.

Brown, a retired Air Force pilot, and partner have recently completed three years of detailed and complex research into fuel consumption and polluting emissions.

The Power Pak evolved from an earlier device called the “Ring of Power,” and it is literally an air-conditioner for combustion chambers. The inexpensive, easy to install device works on any car or truck to improve performance, increase mileage and control emissions.

“Vaporizers and the like have been tried, but they don’t do the job. Our equipment humidifies the air so that combustion takes place under optimum conditions,” Brown explained.

“You cannot see humidity like you can vapor, and that’s probably the reason it works so much better.”

Brown heads the firm of Charlie Brown Enterprises and also a group called Mobile Energy Research Center in Miami.

Everyone knows that a car seems to run better in the rain or when the air is moist. Brown explains it this way:

“Precisely what happens within the engine with humid versus dry air has not been scientifically proven; there are two theories, but nothing positive. We do know, however, that air between 90 and 95 per cent humidity gets the best performance.

“The fuel/air mixture is optimum, the rate of burn is slower and more effective and we see a reduction of carbon deposits in the engine, a reduction of carbon monoxide and a drastic reduction in the oxides of nitrogen (NOx) that pollutes so badly.

“Additionally, our system results in less engine vibration, longer spark plug life, longer engine life, a quieter engine and increased effective road horsepower and significantly improved gasoline mileage.”

That statement sounds like an automaker’s dream commercial. Can it be true?

“We have spent thousands of hours and many thousands of dollars in very thorough and precise testing,” Brown stressed.

For those with technical minds there is a sidebar to this article describing the tests made by Brown and his partner with the help of outside engineers.

“Despite the promise shown by our testing, we have been totally ignored by the various branches of our government that are supposed to be concerned about the problems of fuel economy and pollution,” Brown said with smouldering frustration.

“We have offered to supply our units, at no cost whatsoever to anyone except ourselves, to more than a dozen supposedly concerned institutions,” Brown added.

Letters offering the device for testing without cost have been sent to the Environmental Protection Agency and the Department of Transportation; the State of Florida; General Motors Corporation; Ford Motor Company; Chrysler Corporation; American Motors; Daimler-Benz AG; Dresser Industries; Texaco Development Corporation; Popular Science Magazine; Mechanix Illustrated Magazine; The National Enquirer; Associated Press and United Press International.

It would seem that if our pollution and fuel problems are so pressing as the powers that be claim they are, then any one or all of the above organizations would have excitedly tested a promising device.

Evidently that’s not how it works in our system.

“I don’t think all those bureaucrats buzzing around up in Washington have any sort of system,” Brown complained.

“Both the EPA and the Transportation department flatly refused to test our device or discuss our concept.

“The State of Florida advises us that they cannot test the concept on one of their vehicles because the manufacturer would void the warranty -- can you imagine that?” Brown said with a shake of his head.

“We’re protected by patents so the auto manufacturers can surely look into it without threat of a nuisance suit,” Brown added. “But they ignore us. It’s a mystery to me.”

One of the reasons the auto makers may be choosing to ignore Brown and his device -- hoping he’ll go away -- is the political pork barrel foisted on the public a few seasons ago known as the “catalytic converter.”

American consumers are paying the additional cost of these emissions control units that lower auto efficiency and shave time off engine life.

“If I’ve ever seen a boondoggle, those catalytic converters are it,” Brown noted.

“The thing is expensive -- but profitable for the automakers -- it has no effect on oxides of nitrogen and I’ve seen tests which indicate the catalytic converters actually add another pollutant to the air -- sulphuric acid particles.

“They only reduce carbon monoxide and hydrocarbons, and then only on cars using unleaded gas. For this we have to pay a price? Beats me!” commented the exasperated pilot and engineer.

The EPA ordered the catalytic
Canadian gadget would boost mileage, cut pollution.

New device, new economy: Win win!  

by Janet MacKinnon

The Province, Toronto, May 11, 1994


§ The ultrasonic devices that were used are described in patent Nos. 2755104, Cottell; 3749513, Cottell; and 3756375, Cottell.


The LINDBERG COMBUSTION CONTROL system is a closed loop fluidic control system that responds instantaneously to the engine's power requirements providing the correct amount of air, PCV products, heat, turbulence and water to the Reactor for conversion into super-heated steam, steam, or warm water droplets, depending upon the engine/car operating conditions at any given time.

This response is activated by the engine's changing needs at varying dynamic operating and power conditions, causing changes of static and dynamic water pressure at the Reservoir aft-located water outlet, increasing pressure during acceleration and decreasing pressure in deceleration as applied to the Magtrol inlet and supported by a water suction created by exhaust flow in the Reactor applied to the Magtrol outlet.

In cold soak and cold start the Magtrol body, having a greater coefficient of expansion than the 440 stainless steel ball shrinks, locking the ball, and closes off all water flow until the engine warms the Magtrol body to open the valve.

These above changes, other than under "cold-start" conditions, create the fluidic conditions within the system necessary to counter the force of the magnet, thus moving the ball away from the magnet and ball seat and allowing a specifically metered amount of water to enter the Reactor where, depending upon the engine's needs at that point in time, the water is converted into steam at low to part throttle, and warm water droplets at full throttle, by heat from the exhaust manifold and the induction of fresh air into the Reactor.

This mixture is then conveyed to a high velocity tornado-like mixing and control device called the Control which is plumbed into the PCV line very close to where it enters below the carburetor. This high velocity mixture is introduced into the carburetor under the butterfly valve and directly into the cylinder through the intake valve for firing. This is a super-volatile mixture injected in a highly agitated state at high velocity into the combustion chamber, giving better combustion and distribution, thus providing the additional power, performance, and economy for which the system is designed.

Power is further increased by the provided water droplets vaporizing and cooling the cylinder charge, allowing further charge to enter before the intake valve closes, thus increasing the charge density, a form of super-charging.

The water in the reservoir acts as a heat energy storage device which, due to its location in the V-engine, keeps the intake manifold warm for many hours after engine is off. This works in conjunction with the system operation of re-cycling waste exhaust heat to aid in providing easier starting and smoother, more economical operation during "cold-start" when the standard car is extremely inefficient.
The Lindberg benefits all gasoline powered vehicles through 1979.

Points lower grade fuel.

A system can use 10 octane

Plus 10% Additional Saving.

This table is based on actual testing made with Lindberg and other systems. It is true only in functional combustion control.

Weber injection system is not just another partially functional combustion system engineered to give economy, performance, and complete combustion under all operating conditions.

These dramatic photos show the cleaning effect of the Lindberg.

Combustion Control System either 66 miles or driving 95,000 miles.

The Lindberg IS A BREAKTHROUGH.

After twelve years of research and development.
Inventor Believes Time Ripe For Fuel Additive That Clears The Air

BY JANE WEINMAN STEIN

The San Diego Union

Monday, February 18, 1980

Inventor Believes Time Ripe For Fuel Additive That Clears The Air

After 10 years, three fires and expenses of $1 million, John Cameron Davis believes the time is right for his invention.

Davis, 40, a former savings and loan executive, electronics company president and Los Angeles home builder, got the idea many years ago that a fuel additive was needed to clean up Southern California's air pollution.

He developed a product called "Clean Power" that added to a diesel fuel base to help reduce smoke, soot and noise from engines.

"When pollution was 28 cents a gallon, why, the hell wanted to listen to me?" said Davis in a telephone interview from his home where he was meeting with potential investors. "Now the whole country has moved around."

He sells it although Clean Power is too close to mud season, for real estate, travel as it will be left when California scientists are burned up with oil in their laboratories.

San Diego Gas & Electric Co. is testing Clean Power, but company officials didn't discuss it. "We do use the product and we are evaluating the results," said a SDEA spokesman.

Davis said that domestic sales have been slow, but South Korean, Turkish, Swede and Norwegians rely on steady supplies of Clean Power.

He said in a two-year, $500,000 contract with a major South American nation agree to import the products gallon a year. About one cu yard (300 gallon) of oil was used in the product and Davis said it is about two cents, Davis said.

Last month researchers at Brigham Young University's Iwell Chemicals released a report that says under certain draying conditions, a sample of the diesel fuel is cleaner than the fuel itself.

"This is not to be confused with a report that recommendations a product for a Diesel engine," added Dr. Hammond. 

Hammond and an auto mechanic worked as the deode consultant for the projects BYU's Hammond said he has color photographs to prove that claim.

The most beneficial effect of Clean Power, Davis said, is that it cleans engines by breaking down carbon deposits BYU's Hammond said he has color photographs to prove that claim.

Although some previous emissions tests have not been done, small-scale tests with four at the University of Southern California in 1977 showed that the breathing extracted carbon in three months. Most breathing carbon from using Clean Power.

Davis Power, Inc., has said been tested with good results, recently by truckers carrying Wonder bread for the Food Corp., in Yellow Cab, cabs, and by Medical Equipment Co. of WOB.

As Davis is an auto mechanic, he wasn't too surprised at the results.

Hammond and an auto mechanic worked as the deode consultant for the project. BYU's Hammond said he has color photographs to prove that claim.

"I agreed behind the data in the report," said Dr. Hammond. "He said Clean Power was officially tested by a printing press and airplane like the garage."

Davis, who is an auto mechanic, has been working on this project for 10 years. His laboratory and manufacturing plant have been damaged by unexplained fires.

Clean Power is manufactured in

(Continued from B-3)

Inventor's Dream May Clear Air

(Continued from B-3)
A method and apparatus for improving the efficiency of an internal combustion engine by producing ozone gas and positively charged air particles in a supply of air to an engine. The apparatus comprises an ozone generator cell suitably positioned with respect to the engine so that an air supply to the engine passes between adjacent plates of the ozone generator. In one embodied form, the apparatus comprises a tubular ozone generator cell for charging and ionizing a relatively small volume of air to the engine. The air supply to the generator may be first treated to substantially remove ambient moisture by means of a suitable air dryer. Optionally, a plurality of generators may be connected in sequence to provide an increased source of ozone gas to the engine thereby to commensurately reduce fuel consumption and exhaust gas emissions.
This feature is currently service unavailable.
Means for inducing electric and magnetic fields on flowing fluids

Inventor:
SABURO MIYATA

Filed June 2, 1965

Drawing filed October 24, 1967

Application filed March 5, 1965

Patent Number 3,349,354
A method and apparatus for mixing fuel and an oxidizing agent includes an electrically charged electrode which forms an electrostatic field through which a stream of fuel is passed so that the fuel particles become electrostatically charged and subsequently repel one another to disperse into and mix with an oxidizing agent and vaporize on contact with a heat source such as the wall surface of an intake manifold of an internal combustion engine or the walls of fuel burning apparatus or combustion chambers of jet or rocket engines and the like. Fuel particles passing through the electrostatic field are charged by induction charging and in addition may also be electrostatically charged by direct contact with the electrode, which is provided with an open outlet end to permit a relatively unobstructed flow of intermixed fuel and oxidizing agent with a minimum of flow resistance and little possibility of ice formation.
METHOD AND APPARATUS FOR IMPROVING ENERGY FUELS

Inventor: Roy C. McMahon, 7300 Jarboe, Kansas City, Mo. 64114

Filed: May 11, 1977

ABSTRACT

The application of an electrostatic field across energy fuels subsequently burned in a reciprocating internal combustion engine improves anti-knock characteristics, thereby increasing available energy for engine operation.

1 Claim, 2 Drawing Figures
Combustion air for an internal combustion engine is treated to activate the oxygen molecules prior to mixing with the fuel. The oxygen is photochemically activated by ultraviolet radiation.
A simplified methanol or other hydrocarbon water-vapor injection system and kit for installing it with a minimum of part and effort are provided. A universal hose connector which precludes the necessity for cutting existing hoses on the automobile engine or any hose to which it is desired to connect another is also provided. This connector is constructed to pierce one or both walls of the hose into which connection is desired and place a metering orifice within that hose to thereby inject vapors or the like therein at predetermined rates and reduce vacuum pressure in side of the hose and reservoir of the injector system.
A method and apparatus are provided for treating fluid hydrocarbon fuels. The method includes flowing the fuel through a treater region defined by the apparatus including a cylindrical outer electrode positioned coaxially about an insulated inner electrode. The annular treater region is preferably filled with small dielectric beads of a selected size and having spaces therebetween of a selected size. Also, in the preferred embodiment, the electrodes are connected across the high voltage ignition circuit of a motor, such a motor thereafter consuming the treated fuel, to thereby establish a high intensity electric field within the treater region.

17 Claims, 5 Drawing Figures
Feed system for internal combustion engines to which is fed a fuel-air mixture and water vapor generated by a heat exchanger acted on by the exhaust gases, wherein there is a water chamber arranged before the heat exchanger in the water feed line, characterized in that the inlet and the outlet of the water chamber arranged directly before the heat exchanger are provided with valves which are to open automatically in an intrinsically known manner through the intake reduced pressure of the internal combustion engine and that the opening of the outlet valve is larger and/or longer in time than the opening of the inlet valve.
Hot water is transmitted from an automobile's cooling system to a fuel vaporizer wherein it is utilized to heat gasoline to a vapor state. Air is drawn into the fuel vaporizer utilizing carburetor vacuum and is added to the vapor and drawn into the carburetor. Vaporized fuel and outside air are mixed in a separate dry vapor section within the vaporizer and the amount of allowed to enter the fuel vaporizer is controlled utilizing a valve system. In this manner, the fuel-air vapor is more efficiently burned in the engine and improved gas mileage is achieved.
ABSTRACT

Means for effecting a more efficient combustion by causing the oxygen fed to the combustion zone to be in a south pole magnetic state.

16 Claims, 11 Drawing Figures
A pre-heater for fuel includes a corrugated tubing for passing hot water therethrough. An outer cylinder forms a jacket around said corrugated tubing to form a chamber to receive therethrough the fuel to be heated. The heat from the hot water is transmitted through the corrugated tubing to heat the fuel.

3 Claims, 3 Drawing Figures
G. C. BERGER

VAPOUR GENERATING APPARATUS

Filed Sept. 26, 1962

INVENTOR

GEORGE C. BERGER

BY

Williamson & Pelantic

ATTORNEYS
TREATMENT OF FLUID HYDROCARBON FUELS WITH ELECTRIC FIELDS
Roy C. McMahon, Kansas City, Mo., assignor to Electrostatic Equipment Company, Kansas City, Mo.
Filed Aug. 27, 1930, Ser. No. 181,689
Int. Cl. 27/M

17 Claims

In combination with an internal combustion engine and a fuel source, a treater for treating a fluid hydrocarbon fuel to be combusted in said engine, said treater being fuel flow positioned between said fuel source and said engine so as to improve the combustion efficiency of the fuel, said treater comprising the combination of:
(a) an elongated conductive inner electrode;
(b) an elongated conductive cylindrical outer electrode positioned substantially coaxially about said inner electrode to define an elongated annular treater region therebetween;
(c) a dielectric covering on at least one of said electrodes to insulate said one of said electrodes from said fuel during treatment;
(d) fluid connection means at opposite ends of said outer electrode and communicating with said treater region, one of said fluid connection means being for connection to said fuel source and the other of said fluid connection means for connection to said engine;
(e) a plurality of dielectric particles positioned within said treater region;
(f) means retaining said dielectric particles within said treater region;
(g) high voltage supply means connected to said electrodes.

U.S. Cl. 123—538

FUEL EVAPORATOR
Fukako Yoshida, Toyokawa, Saitama, Japan, assignor to Nippon Sokken Kabushiki Kaisha, Ltd., Nihonbashi, Tokyo, Japan
Filed May 30, 1930, Ser. No. 155,914
Int. Cl. 8, Y 179, H 7477; Apr. 23, 1930, 53-56a22
U.S. Cl. 122—330

10 Claims

1 A fuel evaporator for use in a fuel entry system of an internal combustion engine comprising:
(a) an elongated heating element which is made of ceramics and has a positive temperature coefficient of resistance, the resistance of said heating element suddenly increasing at a specific temperature;
(b) a heating plate which is made of a material having high thermal conductivity and serves said heating element to be coated with a high gloss finish within an in-steam manifold of the internal combustion engine, and said heating plate having an associated electrical power supply comprising:
(c) an elongate vaporization chamber comprised of a tubular length of metal covered with a high temperature resistant, high thermal conductivity electrically insulating material, said heating coil of resistance wire being wrapped into a helix around the electrically, insulating material, and a coating of high temperature refractory material coated over the heating coil and chamber, said vaporization chamber formed with an inlet end for receiving liquid gasoline fuel from the fuel line of the engine and an outlet end for delivering vaporized fuel.
(d) a plurality of dielectric particles positioned within said treater region;
(e) means retaining said dielectric particles within said treater region;
(f) high voltage supply means connected to said electrodes.

U.S. Cl. 123—557

GASOLINE FUEL VAPORIZATION SYSTEM FOR INTERNAL COMBUSTION ENGINES
Robert S. Wilkinson, P. O. Box 61, Newfield, Me. 04055, and Alan S. Lowe, Kennebunk, Me., assignors to Robert S. Wilkinson, Newfield, Me.
Filed Sep. 4, 1979, Ser. No. 71,839
Int. Cl. 142M 31/00

33 Claims

1 A new and improved, gasoline fuel vaporization and delivery system for vaporization of gasoline from the fuel line of an internal combustion engine and for delivery of fuel in the vapor state to a conventional carburetor or into an air stream at the intake manifold of the internal combustion engine, said engine having an associated electrical power supply comprising:
(a) a heating coil of resistance wire comprised of a high temperature durable alloy having a resistance per unit length and overall length selected to generate heat at a temperature above the vaporization temperature of the gasoline fuel fractions or constituents but below the flash point temperature of such fuel constituents, when said coil is coupled to the electrical power supply voltage for the internal combustion engine, whereby the resistance wire heating coil at the applied voltage of the power supply is self limiting in temperature output attained in the vaporization chamber to a level at a safe margin below the flash point of gasoline fractions;
(b) high temperature durable lead wires coupled to the ends of the heating coil, said high temperature lead wires having a lower electrical resistance than the heating coil resistance wire, the couplings having the ends of the heating coil and the high temperature lead wire being of the type durable at high temperature;
(c) a heating housing locating the vaporization chamber and also enclosing the couplings of high temperature durable lead wires to the end of the heating coil;
(d) the elements, located outside the vaporization chamber housing enclosure for coupling to power supply lead wire and valve means to control the flow of gasoline fuel into the chamber including a restricted delivery orifice at the inlet end for fragmenting the liquid fuel as it enters the chamber, and thereby facilitating vaporization, and restricted delivery orifice oriented to deliver fuel in a direction off axis from the elongate axis of the vaporization chamber thereby
GASOLINE FUEL VAPORIZATION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Robert S. Wilkinson, P. O. Box 61, Newfield, Me. 04068, and Alan S. Lowe, Kennebunk, Me., assignors to Robert S. Wilkinson, Newfield, Me.

Filed Sep. 4, 1979, Ser. No. 71,839
Int. Cl. F02M 37/00
U.S. Cl. 123—557

33 Claims

1. A new and improved gasoline fuel vaporization and delivery system for vaporization of gasoline from the fuel line of an internal combustion engine and for delivery of fuel in the vapor state to a conventional carburetor or into an airstream at the intake manifold of the internal combustion engine, said engine having an associated electrical power supply comprising:

an elongate vaporization chamber comprised of a tubular length of metal covered with a high temperature resistant, high thermal conductivity electrically insulated material, a heating coil of resistance wire wrapped in a helix around the electrically insulated material, and a coating of high temperature refractory material coated over the heating coil and chamber, said vaporization chamber formed with an inlet end for receiving liquid gasoline fuel from the fuel line of the engine and an outlet end for delivering vaporized fuel;

said resistance wire heating coil comprised of a high temperature durable alloy having a resistance per unit length and overall length selected to generate heat at a temperature above the vaporization temperature of the gasoline fuel fractions or constituents below the flash point temperature of such fuel constituents, when said coil is coupled to the electrical power supply voltage for the internal combustion engine, whereby the resistance wire heating coil at the applicable voltage of the power supply is self limiting in temperature output attained in the vaporization chamber to a level at a safe margin below the flash point of gasoline fractions;

high temperature durable lead wires coupled to the ends of the heating coil, said high temperature lead wires having a lower electrical resistance than the heating coil resistance wire, the couplings between the ends of the heating coil and the high temperature lead wires also being of the type durable at high temperature;

a means for controlling the vaporization chamber and also enclosing the couplings of high temperature durable lead wires to the ends of the heating coil;

the ends of the high temperature lead wires opposite the couplings located outside the vaporization chamber housing enclosure for coupling to power supply lead wire and valve means to control the flow of gasoline fuel into the chamber including a restricted delivery orifice at the inlet end to fragment the liquid fuel as it enters the chamber and thereby facilitate vaporization, said restricted delivery orifice oriented to deliver fuel in a direction off axis from the elongate axis of the vaporization chamber thereby

an electrical control means for controlling the temperature of the heating wire heating coil; and

a means for self limiting the temperature output of said heating wire heating coil in an amount the product of the resistance wire winding density and the applied voltage with respect to the temperature output of the heating coil, said self limiting means being in response to changes in the temperature of the heating wire heating coil.

2. said means generating one pulse for each spark plug, which will fire during each revolution of a crankshaft in said engine, and

3. the repetition rate of said pulses being directly proportional to engine speed;

4. control means having first and second input terminals and an output terminal for providing a control signal having a duration variable with engine speed thereby to advance the firing of the spark plugs in said engine, said control signal upon termination thereof including the firing of a spark plug;

5. an electronic function generator means for automatically generating an electronic signal of predetermined but constant wave form having a characteristic matching the desired spark advance profile of said engine, said electronic signal commencing responsive to termination of said control signal;

6. means connecting said pulses from said electromagnetic means to said first terminal of said control means, said control signal being initiated by each of said pulses;

7. means closing means connected between said output terminal and said second input terminal for terminating said control signal a predetermined fixed time after initiation thereof in the absence of an electronic signal; and

8. means connecting said electronic signal to said second terminal for automatically advancing termination of said control signal as engine speed increases.

3,923,029

ELECTRONIC IGNITION SYSTEM

Fentz Polo, 9445 Borson St., Downey, Calif., assignor to Fentz Polo


Int. Cl. F02P 5/04
U.S. Cl. 123—143 E

8 Claims

1. An electronic ignition system for internal combustion engines comprising:

A. electromagnetic means for generating a plurality of pulses,

1. said means generating one pulse for each spark plug, which will fire during each revolution of a crankshaft in said engine, and

2. the repetition rate of said pulses being directly proportional to engine speed;

3. control means having first and second input terminals and an output terminal for providing a control signal having a duration variable with engine speed thereby to advance the firing of the spark plugs in said engine, said control signal upon termination thereof including the firing of a spark plug;

C. an electronic function generator means for automatically generating an electronic signal of predetermined but constant wave form having a characteristic matching the desired spark advance profile of said engine, said electronic signal commencing responsive to termination of said control signal;

D. means connecting said pulses from said electromagnetic means to said first terminal of said control means, said control signal being initiated by each of said pulses;

E. capacitive feedback means connected between said output terminal and said second input terminal for terminating said control signal a predetermined fixed time after initiation thereof in the absence of an electronic signal; and

F. means connecting said electronic signal to said second terminal for automatically advancing termination of said control signal as engine speed increases.

4,315,345

PETROLEUM FUEL, VAPORIZATION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Robert S. Wilkinson, P. O. Box 61, Newfield, ME. 04068, and Alan S. Lowe, Kennebunk, ME., assignors to Robert S. Wilkinson, Newfield, ME.

Filed Sep. 4, 1979, Ser. No. 71,839
Int. Cl. F02M 37/00
U.S. Cl. 123 — 557

33 Claims

1. A new and improved petroleum fuel vaporization and delivery system comprising:

an elongate vaporization chamber comprised of a tubular length of metal covered with a high strength resistant, high thermal conductivity electrically insulated material, a heating coil of resistance wire wrapped in a helix around the electrically insulated material, and a coating of high temperature refractory material coated over the heating coil and chamber, said vaporization chamber formed with an inlet end for receiving liquid petroleum fuel from the fuel line of the engine and an outlet end for delivering vaporized fuel;

said resistance wire heating coil comprised of a high temperature durable alloy having a resistance per unit length and overall length selected to generate heat at a temperature above the vaporization temperature of the petroleum fuel fractions or constituents below the flash point temperature of such fuel constituents, when said coil is coupled to the electrical power supply voltage for the internal combustion engine, whereby the resistance wire heating coil at the applicable voltage of the power supply is self limiting in temperature output attained in the vaporization chamber to a level at a safe margin below the flash point of petroleum fractions;

high temperature durable lead wires coupled to the ends of the heating coil, said high temperature lead wires having a lower electrical resistance than the heating coil resistance wire, the couplings between the ends of the heating coil and the high temperature lead wires also being of the type durable at high temperature;

a means for controlling the vaporization chamber and also enclosing the couplings of high temperature durable lead wires to the ends of the heating coil;

the ends of the high temperature lead wires opposite the couplings located outside the vaporization chamber housing enclosure for coupling to power supply lead wire and valve means to control the flow of petroleum fuel into the chamber including a restricted delivery orifice at the inlet end to fragment the liquid fuel as it enters the chamber and thereby facilitate vaporization, said restricted delivery orifice oriented to deliver fuel in a direction off axis from the elongate axis of the vaporization chamber thereby

an electrical control means for controlling the temperature of the heating wire heating coil; and

a means for self limiting the temperature output of said heating wire heating coil in an amount the product of the resistance wire winding density and the applied voltage with respect to the temperature output of the heating coil, said self limiting means being in response to changes in the temperature of the heating wire heating coil.

2. said means generating one pulse for each spark plug, which will fire during each revolution of a crankshaft in said engine, and

3. the repetition rate of said pulses being directly proportional to engine speed;

4. control means having first and second input terminals and an output terminal for providing a control signal having a duration variable with engine speed thereby to advance the firing of the spark plugs in said engine, said control signal upon termination thereof including the firing of a spark plug;

5. an electronic function generator means for automatically generating an electronic signal of predetermined but constant wave form having a characteristic matching the desired spark advance profile of said engine, said electronic signal commencing responsive to termination of said control signal;

6. means connecting said pulses from said electromagnetic means to said first terminal of said control means, said control signal being initiated by each of said pulses;

7. means closing means connected between said output terminal and said second input terminal for terminating said control signal a predetermined fixed time after initiation thereof in the absence of an electronic signal; and

8. means connecting said electronic signal to said second terminal for automatically advancing termination of said control signal as engine speed increases.