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[54] ENGINE HORSEPOWER INCREASING SYSTEM

8 Claims, 7 Drawing Figs.

[52] U.S. Cl. **123/127,**
123/119, 123/139

[51] Int. Cl. **F02m 71/00,**
F02m 13/06

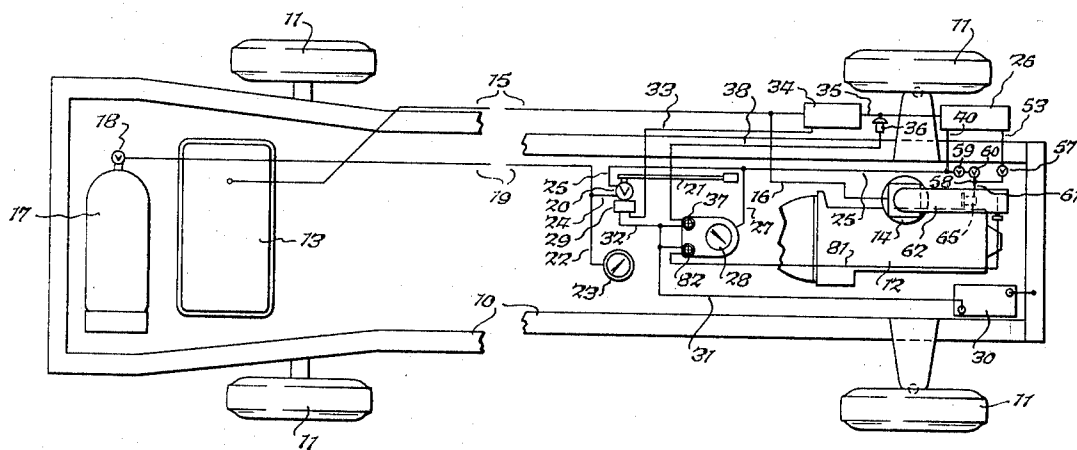
[50] Field of Search **123/119,**
119E, 129.18, 139.18

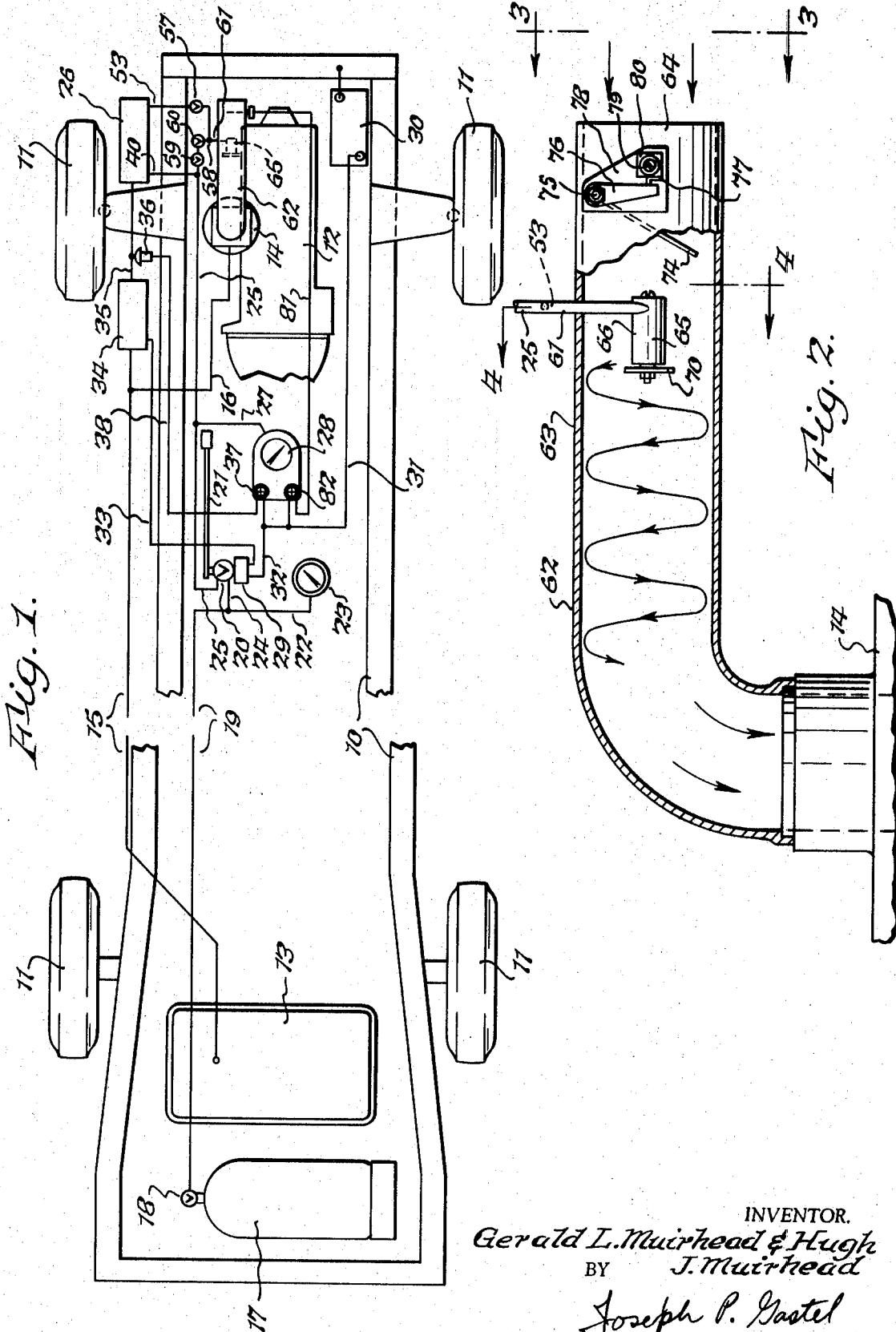
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ABSTRACT: A system for selectively increasing the horsepower of an internal combustion engine having a carburetor for receiving fuel and air for mixing, including an oxygen tank, a conduit arrangement including a valve for selectively supplying oxygen to the engine, a fuel pump, a metering valve in communication with the fuel pump for supplying supplemental fuel to the engine in proportion to the oxygen supplied to the engine, a mixer for mixing the supplemental fuel and oxygen and injecting this mixture into the normal air supplied to the engine, and a signal for indicating if an excessive amount of supplemental fuel and oxygen is being supplied to the engine.





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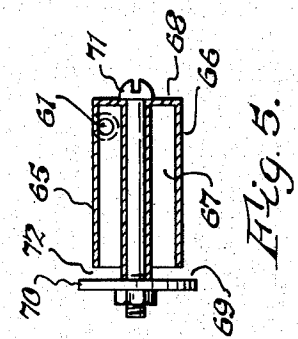


Fig. 5.

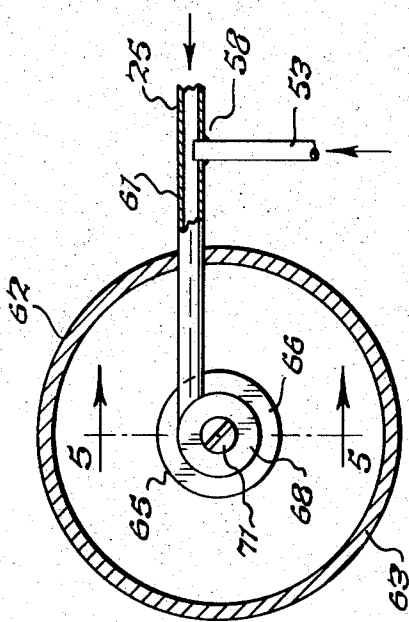


Fig. 4.

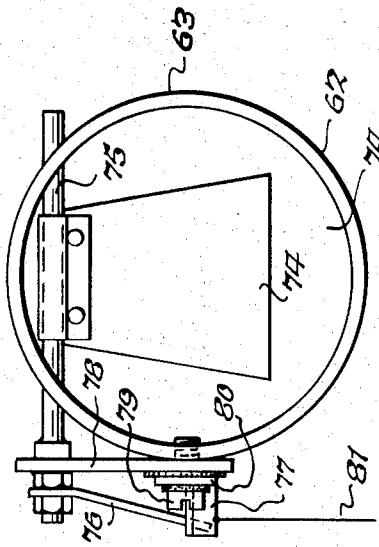


Fig. 3.

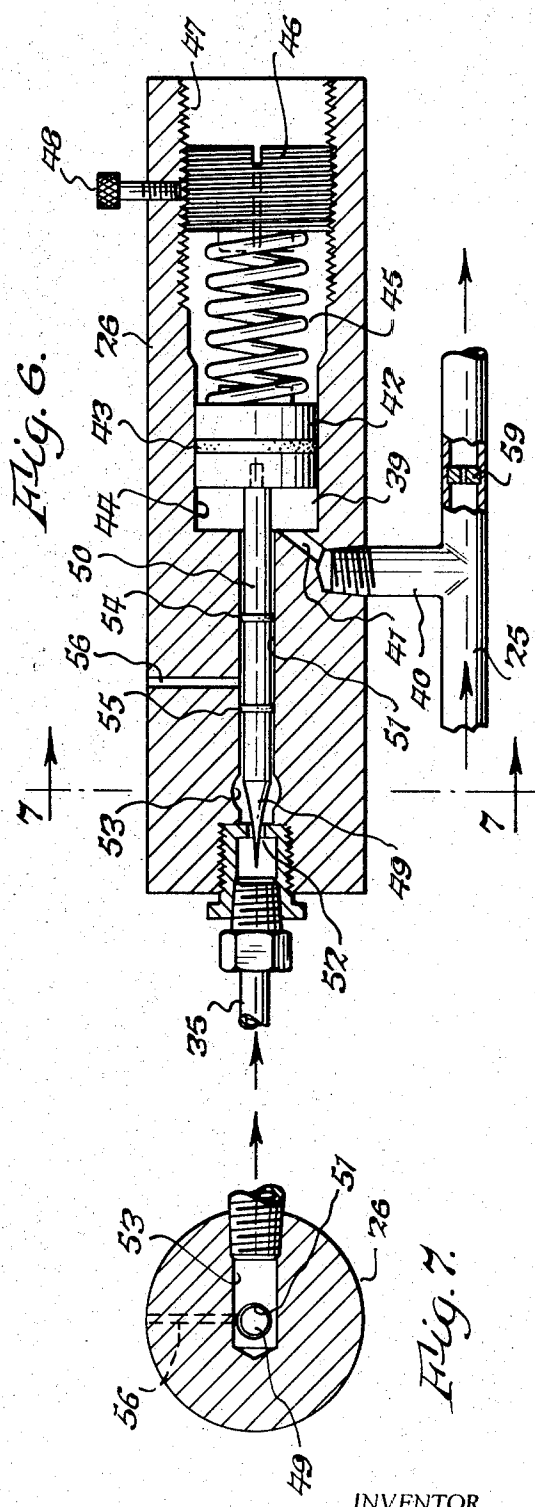


Fig. 6.

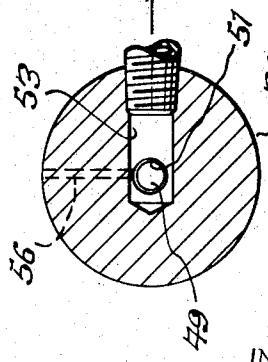


Fig. 7.

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ENGINE HORSEPOWER INCREASING SYSTEM

BACKGROUND OF THE INVENTION

The present invention relates to an improved system for increasing the horsepower of an internal combustion engine.

By way of background, an internal combustion engine utilizes a mixture of fuel and air to provide a work output. The fuel and air are delivered to the engine by a carburetor which mixes them in the proper proportion. Of the air which is used, only the oxygen component thereof is utilized for combustion with the fuel or the gasoline, the nitrogen component being inert. However, since there is no way of selectively extracting the oxygen from the atmospheric air, the carburetor must be designed to receive a volume of air which contains both oxygen and nitrogen in their normal proportions.

SUMMARY OF THE INVENTION

It is the primary object of the present invention to provide an improved engine horsepower-increasing system which injects a mixture of oxygen and supplemental fuel into a carburetor to supplement the normal fuel and air mixture to provide increased horsepower output from an engine, the supplemental fuel and oxygen effectively displacing a part of the atmospheric air which is normally used to support combustion, thereby to effectively increase the amount of combustion per unit of time and therefore provide an increased horsepower output.

Another object of the present invention is to provide an improved engine horsepower-increasing system which can be installed in any existing vehicle for the purpose of selectively increasing the horsepower output thereof. Other objects and attendant advantages of the present invention will readily be perceived hereafter.

The improved engine horsepower-increasing system of the present invention includes a source of oxygen for selective injection into the carburetor mounted on a vehicle, in addition to the normal air-fuel mixture supplied thereto. Since the injection of oxygen raises the percentage of oxygen in the air, and since the carburetor is designed to inject fuel at a rate which depends on the normal percentage of oxygen in the air, supplemental fuel is mixed with the oxygen and injected into the carburetor for combustion by the supplemental oxygen. Thus the engine is supplied with a mixture consisting of normal air and fuel, oxygen, and supplemental fuel to be burned by the oxygen. The amount of oxygen and supplemental fuel can be increased to the extent where the normal air is excluded and the engine receives only its normal fuel, oxygen, and supplemental fuel. It thus can be seen that increasing the rate of combustion of the fuel will provide an increased horsepower output for long or short periods of time, depending on the desire of the vehicle operator. The present invention will be more fully understood when the following portions of the specification are read in conjunction with the accompanying drawings wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a fragmentary schematic view of a vehicle mounting the improved horsepower increasing system of the present invention;

FIG. 2 is a fragmentary side elevational view, partially in cross section, of the injecting mechanism for injecting an enriched fuel-oxygen mixture into the carburetor;

FIG. 3 is an end elevational view of the injecting mechanism taken substantially along line 3-3 of FIG. 2 and showing in greater detail an overflow indicator for determining whether too great an amount of oxygen and fuel is being injected into the carburetor;

FIG. 4 is a view taken substantially along line 4-4 of FIG. 2 and showing the relative positioning between the actual supplemental fuel-oxygen injector and the casing in which it is located;

FIG. 5 is a view partially in cross section taken along line 5-5 of FIG. 4 and showing in greater detail the vortex injector mixer;

FIG. 6 is a view partially in cross section showing the construction of the metering device for combining the supplemental fuel and oxygen in the proper amounts prior to the delivery thereof to the vortex injector; and

FIG. 7 is a view partially in cross section taken substantially along line 7-7 of FIG. 6.

DESCRIPTION OF THE PREFERRED EMBODIMENT

In FIG. 1 a vehicle body 10 is shown which mounts wheels 11 and engine 12 in the conventional manner and in addition contains the improved engine horsepower-increasing system, which will be described in greater detail hereafter.

Mounted on the vehicle is a conventional gasoline tank 13 in communication with carburetor 14 through conduits 15 and 16. It will be appreciated that this particular liquid circuit is conventional and contains the usual fuel pump (not shown) and related devices which are not shown in the drawings in the interest of simplicity. During operation of the vehicle the fuel is conducted to the carburetor in the conventional manner and the horsepower-increasing system of the present invention in no way interferes with this flow.

As noted briefly above, it is the purpose of the present invention to modify an internal combustion engine fuel feeding system so that the horsepower output thereof can be increased. The normal carburetion system is designed to take in a mixture of fuel, in this instance gasoline, and air, mix them, and cause this mixture to be ignited in the engine to convert the energy thereof into horsepower. It is only the oxygen component of the air which will cause the combustion of the gasoline. The nitrogen in the air is inert. In this respect in the normal air used for combustion, there is approximately 20.7 percent oxygen and approximately 79.3 percent nitrogen by volume. As noted above, it is only the oxygen which is utilized for combustion, but the carburetor can only take in air from the atmosphere and thus must also pass the nitrogen through it which leaves in the same state in which it is entered, namely, as inert nitrogen gas without in any way contributing toward combustion.

In accordance with the present invention, oxygen is supplied to the engine to supplement the oxygen in the air. However, the design of the carburetor on any conventional engine is such that the amount of fuel which it will take in is determined on the basis of a mixture of atmospheric air containing normal amounts of oxygen and nitrogen so that if more oxygen is injected, there will not be a sufficient amount of fuel injected which can be used for combustion. Therefore, a supplemental amount of fuel is injected in addition to that normally injected in the carburetor, with this supplemental amount of fuel being in direct proportion to the additional oxygen so that all of the oxygen supplied to the engine produces combustion. In other words, injected into the carburetor is the normal amount of fuel supplemented by additional oxygen and additional fuel in the proper ratio so that all of the fuel and all of the oxygen are utilized in combustion. The amount of supplemental fuel varies directly with the amount of supplemental oxygen, and the additional mixture of fuel and oxygen can be increased to the point where normal atmospheric air is excluded and the engine operates solely on the original fuel and injected oxygen and supplemental fuel.

To achieve the foregoing, an oxygen cylinder 17 is suitably mounted on a vehicle, preferably in the trunk and contains a main valve 18 thereon which must be opened after the tank has been installed. It will be appreciated that the contents of the tank will be consumed and therefore tank 17 may be replaced with another tank of compressed oxygen, as required. Leading from valve 18 are conduits 19 and 24 which terminate at manually controlled valve 20 having a lever 21 thereon, which may be manipulated by the vehicle operator whenever it is desired to operate the engine horsepower-in-

creasing system. When valve 20 is closed, the engine will operate in its normal conventional manner. Also in communication with conduit 19 is conduit 22 which leads to gauge 23 for indicating the pressure in oxygen tank 17, which may be as high as 2,500 p.s.i. While a tank of compressed oxygen has been depicted, it will be understood that any other suitable source may be used, including liquid oxygen.

Assuming that the vehicle is being driven and the operator desires to increase the horsepower output, he need merely manipulate lever 21 to open valve 20 the desired amount. This will cause flow of oxygen from conduit 24 to conduit 25 which leads to oxygen-fuel metering device or valve 26. (See also FIG. 6). In addition, conduit 27 is in communication with conduit 25 and leads to pressure gauge 28 which may be mounted on the vehicle dashboard for indicating the pressure in conduit 25, which may be as high as 80 p.s.i.

As soon as valve 20 has been opened switch 29 will close to complete an electric circuit from ground through the vehicle battery 30, lead 31, lead 32, switch 29 and lead 33 to grounded pump 34 which is in communication with conduit 15 leading from gas tank 13. The energization of pump 34, which is in addition to the normal fuel pump on the vehicle, will cause a flow of fuel from conduit 15 into conduit 35. As soon as pressure in line 35 reaches 6 to 8 p.s.i., pressure-sensitive switch 36 will be energized to complete an electrical circuit to indicator light 37 on the dashboard via lead 38 leading to light 37 and lead 31 leading to battery 30. The ground connections are not shown. This will inform the vehicle operator that pump 34 is operating to provide gasoline at a pressure of approximately 10 p.s.i.

However, the amount of fuel which is utilized from conduit 35 in metering device 26 depends on the amount of supplemental oxygen which is being supplied to the carburetor through conduit 25. In other words, if more oxygen is supplied, more fuel is needed to consume the oxygen, and, conversely, the less oxygen, the less fuel. It can be seen that the oxygen pressure in conduit 25 depends on the amount that valve 20 has been opened and it is this pressure which is applied to chamber 39 (FIG. 6) of metering device 26 through conduits 40 and 41. This pressure will cause piston 42, having O-ring 43 thereon to effect sealing with chamber wall 44, to move to the right against the bias of spring 45 which is held in position by adjustable screw 46 which can be adjusted in tapped bore 47 as desired and locked in position by setscrew 48. It will be appreciated that the force of spring 45 will depend on the position of screw 46.

If a relatively high oxygen pressure is applied to chamber 39 for any given setting of spring 45, piston 42 will move to the right a predetermined amount, as is well understood. If the pressure is increased, it will move more to the right, and if decreased, it will move more to the left. A needle 49 has a stem 50 secured to piston 42, said stem riding in bore 51 of metering device 26. As can be seen, the position of needle 49 relative to orifice 52 is determined by the pressure in chamber 39 and thus will control the amount of fuel passing from fuel conduit 35 through orifice 52 and entering conduit 53 which leaves metering device 26. The end of needle 49 has a suitable contour for varying the flow of fuel in proportion to the change in oxygen pressure and the contour may be straight or curved, as required. At this point it is to be noted that stem 50 mounts O-rings 54 and 55 to prevent mixing of oxygen from chamber 39 with fuel from conduit 53. In this respect if there should be any leakage of oxygen from chamber 39 to the left of O-ring 54 or leakage of fuel to the right of O-ring 55 it will be vented to the atmosphere through vent 56.

As can be seen from FIG. 1, conduit 53 has a check valve 57 therein to prevent backflow and this conduit is in communication with conduit 25 leading from valve 20 at junction 58. However, before reaching junction 58, conduit 25 has a plate orifice 59 (FIGS. 1 and 6) therein for reducing the oxygen pressure from that upstream thereof to approximately atmospheric pressure for mixing with the fuel emanating from conduit 53 at junction 58. In addition, a check valve 60 is provided to

prevent backflow in conduit 25. After junction 58 (FIGS. 1 and 4) conduit 61 conducts the mixture of supplemental fuel and oxygen to the vortex injector 62 which leads to carburetor 14. When the increased horsepower system is not operating, the vortex injector 62 functions as an ordinary air intake for the carburetor and air is taken in through end 64 in the direction of the arrows and conducted to carburetor 14 for mixture with the fuel which is supplied through the conventional fuel conduit 16. However, when supplemental fuel and oxygen are being injected, it will displace a certain amount of the air which is taken in.

The vortex injector 62 includes a vortex mixer 65 having a cylindrical housing 66 which is concentrically mounted within casing 63 and is located at the end of conduit 61. The mixture of oxygen and supplemental fuel emanating from conduit 61 enters cylindrical chamber 67 tangentially from conduit 61 and this causes a forced vortex of generally spiral shape to form as the mixture of supplemental fuel and oxygen bounces off of the inside of cylindrical wall 66. It then passes to the left in FIGS. 2 and 5 because the right end of chamber 67 is closed by end wall 68 (FIG. 5). This mixture will then impinge on face 69 of baffle plate 70 which is held in position by bolt 71 and will bounce off of face 69 of plate 70 and move radially outwardly through annular opening 72 toward wall 63 of the vortex injector. It will impinge against this wall and a vortex will form as shown in FIG. 2 as the mixture of oxygen and supplemental fuel is picked up and sucked into the carburetor along with the air which is passing through housing 63. The second vortex enhances the mixing of the oxygen and supplemental fuel with the air.

It can thus be seen that the carburetor 14 is supplied with a mixture which can consist of its normal fuel, supplemental fuel, oxygen, and air, with the supplemental fuel and oxygen displacing a certain amount of the air which would otherwise be used. In fact, if a sufficient amount of oxygen and supplemental fuel were injected, depending on the amount that valve 20 is opened, the normal air would be eliminated so that the engine would be operating on its normal fuel, supplemental fuel and oxygen, without utilizing atmospheric air.

It will be appreciated that if valve 20 is opened too great an amount, an excess of oxygen and supplemental fuel could be released and this would force the mixture emanating from vortex mixer 65 to move to the right in FIG. 2 and out of housing 63. This is a condition to be avoided because it is undesirable to mix the oxygen and fuel and not have it go to carburetor 14. Accordingly, a signal system is set up to warn the operator in the event that this occurs. More specifically, a vane 74 (FIGS. 2 and 3) is rigidly secured to shaft 75 which is pivotally mounted on housing 63 so that when there is air flow from right to left through housing 63 vane 74 will tend to be held in a position to the left of vertical. As there is an increase in air flow it will pivot in a clockwise direction and as there is a decrease it will tend to pivot in a counterclockwise direction in FIG. 2. If the oxygen and supplemental fuel is delivered at too great a rate, the air pressure vane 74 will pivot in a counterclockwise direction until the time that arm 76 which is rigidly secured to shaft 75 engages contact 77 which is secured to but insulated from bracket 78. More specifically, a screw 79 extends through flange 80 formed integrally with contact 77 and insulators, not numbered, are located on opposite sides of flange 80. A lead 81 is secured to contact 77 and is in electrical engagement with lamp 82 mounted on the vehicle dashboard which is connected to battery 30 through lead 31. It will readily be seen that as vane 74 assumes a more vertical position, a point will be reached where arm 76 engages contact 77 to complete a circuit through lamp 82 to provide a signal that too much supplemental fuel and oxygen are being supplied to housing 63 and this is indicated to the vehicle operator to reduce the oxygen pressure by manipulating lever 21.

It will be appreciated that oxidizers of any sort can be used in addition to the compressed and liquid oxygen heretofore discussed.

While the improved system of the present invention has been described relative to a vehicle it will be appreciated that it also has application with stationary engines of all types where periodic surges of extremely high power may be required.

We claim:

1. A system for obtaining increased horsepower from an internal combustion engine having a fuel and air supply associated therewith comprising first means for supplying oxygen to the engine, second means for supplying supplemental fuel to said engine for combustion by said oxygen, said first means comprising a source of oxygen, first conduit means for effecting communication between said source of oxygen and said engine, valve means in said first conduit means for controlling the flow of oxygen to said engine, said second means comprising second conduit means and a fuel pump for supplying supplemental fuel to said engine, a fuel metering valve in communication with said second conduit means, means responsive to the pressure of oxygen in said first conduit means for controlling the amount of fuel passing through said fuel metering valve, third conduit means in communication with said fuel metering valve for conducting said amount of fuel from said fuel metering valve, and mixing means for mixing said oxygen in said first conduit means and said fuel in said third conduit means for delivery to said engine.

2. A system as set forth in claim 1 wherein said mixing means comprises an injector having an outlet, fourth conduit means for conducting the normal air supply to said engine, means positioning said outlet in said fourth conduit means for causing the oxygen and fuel emanating from said outlet to be entrained by the air in said fourth conduit means.

3. A system as set forth in claim 2 wherein said injector comprises a hollow cylindrical member centrally located within said fourth conduit means, fifth conduit means for combining the flow from said first conduit means and said third conduit means and said third conduit means for injecting the mixture of oxygen and fuel tangentially into said hollow cylindrical member, a baffle plate secured proximate the end of

said cylindrical member to provide an annular opening at the end thereof and for projecting said mixture transversely to the flow of air in said fourth conduit means.

4. A system as set forth in claim 2 including means for sensing when excessive amounts of oxygen and fuel are injected into said fourth conduit means.

5. A system as set forth in claim 1 including a first check valve in said first conduit means and a second check valve in said third conduit means for preventing cross flow between said first and third conduit means.

6. A system for obtaining increased horsepower from an internal combustion engine comprising a primary fuel source, first conduit means in communication with said engine for conducting a normal air supply to said engine, an injector, a supplementary fuel source, second conduit means in communication with said injector for conducting fuel from said supplementary source to said injector; third conduit means in communication with said injector for conducting oxygen to said injector, and means positioning said injector in said first conduit means for causing oxygen and fuel emanating from said injector to be entrained by the air being conducted through said first conduit means to said engine.

7. A system for obtaining increased horsepower from an internal combustion engine as set forth in claim 6 wherein said injector comprises a hollow cylindrical member having a closed end and an open end, said injector being centrally and coaxially located within said first conduit means, and a baffle plate secured proximate said open end of said cylindrical member to provide an annular opening at said open end for projecting flow from said injector transversely to the flow of air in said first conduit means.

8. A system for obtaining increased horsepower from an internal combustion engine as set forth in claim 7 including fourth conduit means for combining the flow from said second conduit means and said third conduit means for injecting a mixture of oxygen and supplemental fuel tangentially into said hollow cylindrical member.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,556,066 Dated January 19, 1971

Inventor(s) Hugh J. Muirhead and Gerald L. Muirhead

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 5, line 36 (claim 3), cancel "and said third conduit means".

Signed and sealed this 11th day of May 1971.

(SEAL)
Attest:

EDWARD M. FLETCHER, JR.
Attesting Officer

WILLIAM E. SCHUYLER, J
Commissioner of Paten