DEVICE FOR TREATING FLOWING FLUIDS

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10 Claims. (Cl. 315—153)

This application is a continuation-in-part of my co-
dpending application Serial No. 200,883, filed June 6, 1962, now abandoned.

This invention relates to a device for treating flowing fluids, and more particularly to such a device adapted to be placed in a line through which a liquid flows that is to be used as fuel for internal combustion motors and the like. A device of the kind disclosed herein, when placed in such a line or in the fuel line of an internal combustion motor, subjects the fuel to the concomitant action of a powerful magnetic flux and the action of an electric field. This results in improved combustion and greater efficiency in the operation of an internal combustion motor.

The object of this invention is the provision of a device adapted to be applied to the fuel intake of an internal combustion motor and through which the fuel passing therethrough is subjected to the combined effects of an intense magnetic flux and the application of an electric field.

A further object of this invention is the provision of a device for vitilizing the fuel adapted for use with an internal combustion motor, resulting in more complete combustion, a reduction of smoke producing gases, and greater efficiency.

An additional object of this invention is the provision of a device for treating fuel in which the fuel flows through a tortuous path while being subjected to the combined effects of a strong magnetic flux and an electric field.

An additional object of this invention is the provision of a device adapted to be placed in a pipe carrying a fluid such as gasoline which may be flowing from a storage tank to a tank car or truck, or from a tanker to a service station supply, or from a service station supply to the tank of a motor vehicle.

Still another object of this invention is the provision of a device of the type referred to, which is substantially tubular in form, and flexible, permitting it to be installed where a rigid tube could not be mounted.

It seems that gasoline, after storage, loses some pep or becomes “stale.” When treated by the device of this invention, pep seems to be restored and the fuel acts as if it were fresh. When used, after such treatment, greater efficiency results; carbon deposits are reduced and power is increased.

These and other objects will be apparent from a consideration of the following specification taken with the accompanying drawings, which together form a complete disclosure of my invention.

In the drawings, wherein like characters of reference indicate like parts throughout the several views:

FIG. 1 is a central longitudinal section of the device substantially on the line 1—1 of FIGS. 2 and 3;

FIG. 2 is a vertical section on the line 2—2 of FIG. 1;

FIG. 3 is a vertical section on the line 3—3 of FIG. 1.

Referring now to FIG. 1, 10 represents the treating device of this invention which comprises a tubular assembly adapted to connect at one end to the pipe 11 leading from a fuel supply. At its other end the treating device connects to a pipe 12 which may lead to another tank or to the carburetor of the internal combustion motor.

To connect the device 10 to the pipe 11, I provide a section 13 of hose which is clamped to the pipe 11 by the clamp 14. This hose 13 may be rubber, Buna rubber or suitable flexible plastic material, not detrimentally affected by the fuel. Within the hose 13, disposed in the pipe 11, I place a ring 15 of insulating material. A pipe 16 is placed within the hose 13 and is clamped therein by the clamping ring 17.

The tube 16 extends beyond the end of the hose 13 and on it, adjacent the tube 13, is a ring 18 of insulating material. In an opening 19 in ring 18 I place an electrode 20 which is forced against the pipe 16 by means of the threaded piece 21. A wire 22 connects the electrode 20 to a suitable source of E.M.F., such as a point on the electrical system appertaining to the motor, preferably the ignition switch.

Adjacent the ring 18 a bushing 23 of non-magnetic material is forced on the pipe 16, said bushing having an opening 24 adapted to make a fluid tight connection with the pipe 16. An annular groove 25 is formed in the bushing 23, spaced outwardly from the opening 24, in which a tubular flexible member 26 has one end inserted in the groove 25 with a fluid tight fit. A bushing 27 of non-magnetic material, similar to bushing 23, having a central opening, is forced on the pipe 12 with a fluid tight fit. An annular groove 29 is formed in the bushing 27 and receives the opposite end of the tube 26 with a fluid tight fit.

A plurality of magnets 30, magnetized in an axial direction, are placed within the tube 26. As shown in FIG. 2, these magnets 30 are discs or prisms, polygonal, preferably hexagonal, in cross-section. They are preferably formed of a suitable sintered ferrite, such material being a non-conductor of electricity. The magnets 30 are spaced apart by spacer discs 31, each disc 31 is an annulus and has an annular series of spaced apart protrusions 32 surrounding the central opening 33, as clearly shown in FIG. 3. Each disc 31 is provided with diametrically positioned notches 34, 35. The discs or spacers 31 are preferably formed of non-magnetic, non-conducting material.

A washer 36 having a dish 37 on one face and a sleeve 38 on the other face, is placed with its sleeve 38 over the end of pipe 16. A spring 40 has one end confined in the dish 37 and the other end in a dished washer 41 bearing against the magnet 30 nearest the inlet end of the tube 26. A conductor 42 is attached to the dished washer 41 and passes through the notches 34 and the spaces between sides 49 of the hexagonal magnets and the inner periphery of the tube 26. A dished washer 43 bears against the magnet 30 nearest the outlet end of the tube 26 and retains one end of a spring 44. A washer 45 having a sleeve 46 on one face and a dish 47 on the other face accepts the spring 44 in its dished portion 47 and its sleeve 46 fits over the end of the pipe 12. A conductor 48 is attached to the dished washer 43 and passes through the notches 35 and in the spaces between the sides 49 of the magnets 30 and the inner periphery of the tube 26. The pipe 12 is grounded within the hose 13, the conductor 42 being connected to the source of E.M.F. through the washer 41, the spring 40, the washer 36, the pipe 16, the electrode 20 and the conductor 22. The ground is through the pipe 12, the washer 45, the spring 44, the washer 43 and the conductor 48. From the conductor 42 to the conductor 48 the flow is through the fluid which offers a resistance of several megohms.

The operation will now be described. The device 10 is inserted in a fuel line, such as 11, leading from a fuel supply to a carburetor or other point of use or collection. A source of E.M.F., such as the battery, supplies E.M.F. to an internal combustion motor, is connected to the conductor 22. The ground 50 is through the frame of the motor or other machine parts. The
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3. A device for treating fluid fuel, means for connecting said device to spaced apart portions of a line through which fuel flows comprising a flexible tubular member means on said tubular member for attachment to a pipe carrying liquid fuel, a series of polygonal prismatic magnets axially aligned in said tubular member, means spacing said magnets axially of said tubular member, a conductor extending axially of said tubular member between said magnets and the inner periphery of said tubular member, means connecting said conductor to a source of E.M.F., a second conductor extending axially of said tubular member between the magnets and the inner periphery of said tubular member, means grounding said second conductor.

2. The device according to claim 1 wherein the coupling means for connecting one end of said tubular member to the fuel line comprises a section of rigid metallic tubing, insulating means spacing said tube from said fuel line, a hose coupling connecting one end of said tube to the fuel line, an elastomeric bushing fitted on the other end of said tube with a fluid tight fit, means on said bushing accommodating an end of the flexible tubular member with a fluid tight fit.

3. The device according to claim 2, including an insulating ring on said tube between said hose and said bushing, an electrode in said ring in engagement with said tube, a conductor connecting said electrode with a source of E.M.F.

4. The device according to claim 2 wherein the means for attaching the other end of the tubular member to the fuel line comprises an elastomeric bushing engaging the fuel line with a fluid-tight fit and having means for accommodating the end of the tubular member with a fluid-tight fit.

5. The device according to claim 1, wherein the means spacing the magnets comprises a series of annulli each having a pair of substantially diametrical notches to accommodate the conductors, each annulus having a series of spaced apart protrusions, on each face, surrounding the central opening.

6. The device according to claim 1, including spring means between one of the end magnets of the series and an end of the spaced apart portions of the fuel line and connecting the other end magnet and the metallic tube.

7. A device for treating fuel comprising a flexible, cylindrical, tubular member, an axial series of polygonal prismatic magnets in said tubular member, annular disc like spacers between pairs of such magnets, means connecting the interior of the tube to a source of E.M.F., the fuel passing through the peripheries of the magnets and through the axes of the spacers in a tortuous path.

8. The device according to claim 7, including protrusions on the faces of the spacers to space the magnets from the spacers.

9. The device according to claim 7 wherein the magnets are magnetized substantially axially of the flexible tube.

10. A device for treating fuel comprising a hollow casing having greater length than cross sectional dimension, a series of magnets in said casing, each having peripheral portions spaced from the inner surface of the casing, spacers between pairs of magnets, having axial openings therein, said spacing and said openings providing a tortuous path for the fuel, and means subjecting the fuel to the influence of an electric field in said casing.

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