Oct. 23, 1962 SABURO MIYATA MORIYA 3,060,339

MEANS FOR IONIZING FLUIDS

Filed Nov. 14, 1960

Fig-1

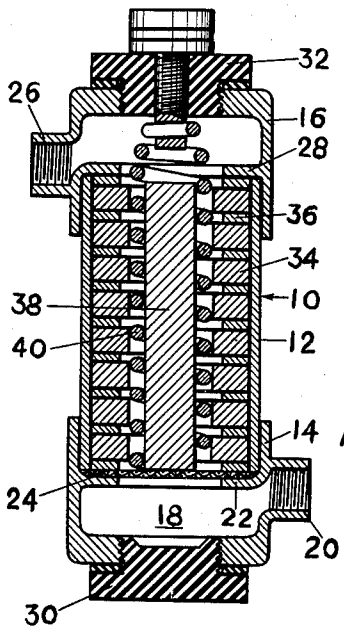


Fig-2

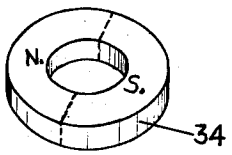


Fig-3

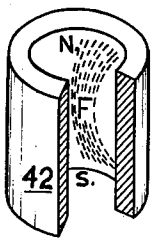


Fig-4

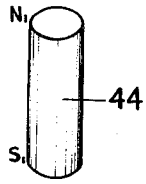


Fig-5

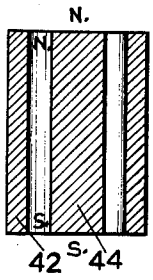


Fig-6

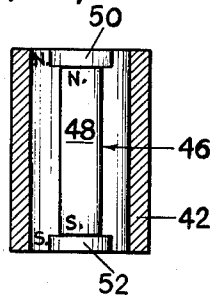


Fig-7

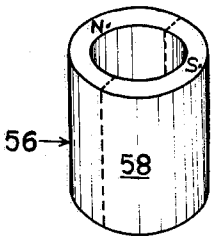


Fig-8

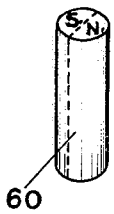


Fig-9

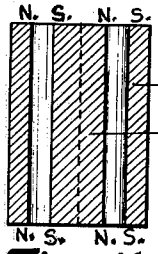


Fig-10

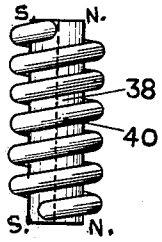
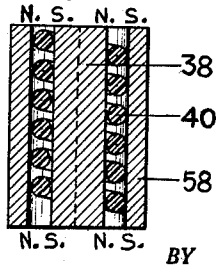


Fig-11



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3,060,339

MEANS FOR IONIZING FLUIDS

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9 Claims. (Cl. 313—153)

This invention relates to a means for ionizing fluids by the application of very strong magnetic flux to flowing fluids. The invention is particularly adapted to be used in the fuel line of an internal combustion motor for wholly or partially ionizing the fuel flowing therethrough.

An object of this invention is the provision of means for creating an area of intense magnetic flux in the path of a flowing fluid used as fuel in an internal combustion motor.

A further object of this invention is the provision of means for ionizing a flowable fluid by subjecting it to the effects of a very strong magnetic flux in its path of movement.

An additional object of this invention is the provision of a relatively simple magnetic ionizer adapted for insertion in the fuel line of an internal combustion motor.

Another object of this invention is the provision of means for producing a very strong magnetic flux which includes annular magnets which are preferably magnetized along a diameter.

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

In the drawings:

FIG. 1 is a longitudinal sectional view through a preferred form of my invention;

FIG. 2 is a perspective view of one of the magnets in FIG. 1;

FIGS. 3–11 show other forms of magnet assemblies which may be used in lieu of that shown in FIG. 1, wherein:

FIG. 3 is a perspective view, partly in section, of an annular magnet, magnetized on its interior face having its N. and S. poles spaced from the ends of the annulus;

FIG. 4 is a perspective view of a rod magnet;

FIG. 5 is a sectional view showing the magnets of FIGS. 3 and 4 in assembled position for use in the device in lieu of the magnets shown in FIG. 1;

FIG. 6 is a part sectional view showing the use of a different type of rod magnet;

FIG. 7 is a perspective view of an annular magnet magnetized on a diameter;

FIG. 8 is a perspective view of a rod magnet magnetized on a diameter;

FIG. 9 is a sectional view of the magnets of FIGS. 7 and 8 in assembled position;

FIG. 10 is an elevation of a different core arrangement;

FIG. 11 is a sectional view of the magnets of FIGS. 7 and 10 in assembled position for use in the device in lieu of the magnets shown in FIG. 1.

Referring now to FIG. 1, the ionizing device is represented as a whole by the numeral **10**, and comprises a casing **12** of non magnetic material, preferably brass. End caps **14** and **16** are mounted on the casing **12**. The end cap **14** has a dome **18** and a side tap **20** which constitutes the fluid inlet. A flange **22** engages a stainless metal wire screen **24** and clamps same against the end of the casing **12**. The end cap **16** is similar in all respects to the cap **14**, and the side tap **26** constitutes the outlet. The flange **28** clamps the tube and holds the magnet assembly in place. The end cap **14** is provided with a drain plug **30**, and the end cap **16** is provided with a clean out plug **32**.

Inside the casing **12** I place the magnet assembly,

which comprises a plurality of ring magnets **34** of like dimensions, spaced apart and from the end caps by means of non magnetic spacer rings **36**. Each of the magnets **34** is formed of sintered ferrite and is magnetized on a diameter as best indicated in FIG. 2. The axes of magnetization are preferably staggered along the length of the assembly. A core magnet **38** is placed in the axis of the assembly. The magnet **38** is preferably a rod of sintered ferrite, and is preferably magnetized on a diameter. A spiral of non magnetic spring material **40** surrounds the core magnet **38** as shown in FIG. 10. A spring **42** presses against the clean out plug **32** and the end of the core magnet **38** to hold the latter in assembled position, the other end of said core magnet **38** engaging the screen **24**. The spiral **40** causes fluids to pass in a helical path about the core magnet **38** between it and the ring magnets **34**. The size of the core magnet **38** is such that the gap between it and the magnets **34** is quite small, but not small enough to materially impede the fluid flowing therein. In its passage the fluid is subjected to intense magnetic flux, and to a rapidly changing of the direction of such flux paths, to produce ionization of the fluid.

FIG. 3 shows an annular magnet **42** which may be substituted for the annular magnets **34**. This magnet **42** is formed of sintered ferrite and is magnetized on its interior with its N. and S. poles spaced from the ends of the annulus, and the main area of flux F on the inside of the annulus as shown in FIG. 3. FIG. 4 shows a bar magnet **44**, magnetized at its ends and which may be substituted for the core **38**. The magnets **40** and **42** are shown assembled in FIG. 5. FIG. 6 shows the annular magnet **42** with a different core **46**. The core **46** comprises a bar or rod magnet **48** having end pieces **50, 52**. These end pieces enable the use of a powerful, small bar magnet, but provide a very small air gap **54**.

In FIG. 7, I show another annular magnet **56** which may be substituted for the magnets **34**. This magnet comprises an annulus **58** formed of sintered ferrite and magnetized on a diameter, as shown by the placement of the letters N. and S. In FIG. 8 there is illustrated a core magnet **60** which may be used with the magnet **56**, and which is likewise formed of sintered ferrite and is magnetized longitudinally on a diameter, as indicated by the N. and S. lettering on this figure.

The use of any of the magnets of FIGS. 3 to 8 in lieu of the magnets **34** in FIG. 1 will produce a device which will subject fluids passing therethrough to an intense magnetic flux. The combined effect of the flux and the movement of the fluid will produce an ionization. When used in the fuel line of an internal combustion motor, the combustion is more complete. Improved combustion and a reduction in smog forming gases results from such operation.

This invention is an improvement over the device claimed in U.S. Patent No. 2,926,276, issued to Moriya and Asakawa, on February 23, 1960.

Having described my invention in several forms, I desire it to be understood that other forms may be employed within the skill of the art and the scope of the appended claims.

I claim:

1. A device for ionizing fluids comprising a non magnetic cylindrical casing having a fluid inlet at one end and a fluid outlet at the other end, a plurality of axially arranged, annular magnets arranged within the casing, means for spacing the magnets from each other, a rod magnet passing axially through the annular magnets and spaced therefrom a short distance to leave a small gap, means within said gap for causing the fluid to take a spiral path in its passage through the casing.

2. The structure as defined in claim 1, wherein the means for spacing the annular magnets comprises a plurality of annular members of non magnetic material.

3. A device for ionizing fluids comprising a cylindrical casing having a fluid inlet at one end and a fluid outlet at the other end, at least one annular magnet within the casing, a rod magnet passing axially through the annular magnet and spaced a short distance therefrom to form a small gap to subject the fluid passing therethrough to a very strong magnetic flux.

4. The structure as defined in claim 3, wherein the annular magnet is magnetized principally on its interior and wherein the N. and S. poles thereof are spaced inwardly from the ends of the annulus, and wherein the rod magnet is magnetized along its axis.

5. The structure as defined in claim 3, wherein the annular magnet is magnetized along a diameter, and wherein the rod magnet is also magnetized along a diameter.

6. The structure as defined in claim 1, wherein the means causing fluid to travel in a spiral path comprises a spiral spring having spaced apart coils and surrounding the rod magnets.

7. The structure as defined in claim 1, including a spring between one end of the casing and the rod magnet to hold the assembly in proper position, and a non corrodible filter means at the other end against which the rod magnet rests.

8. The structure as defined in claim 3 wherein the annular magnet is formed of sintered ferrite.

9. The structure as defined in claim 1, wherein the annular magnets are formed of sintered ferrite and are magnetized along a diameter, the axes of magnetization being staggered along the length of the casing.

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