

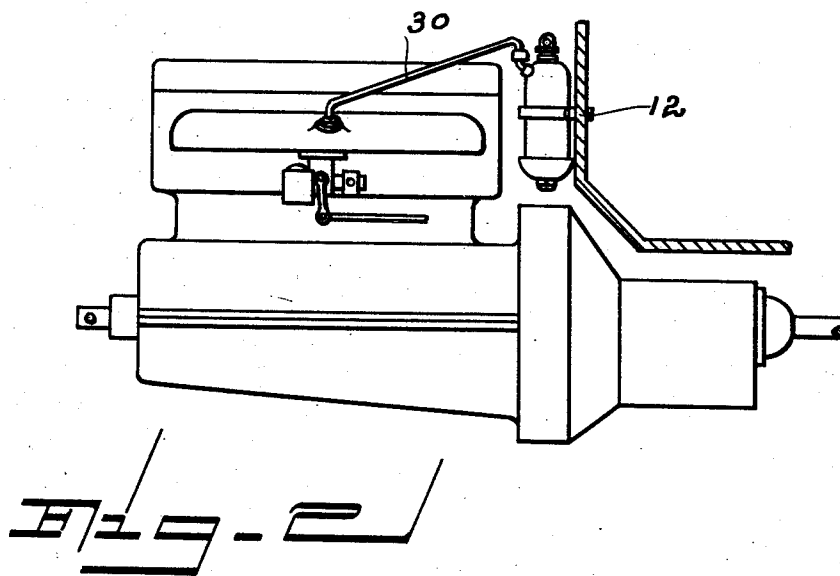
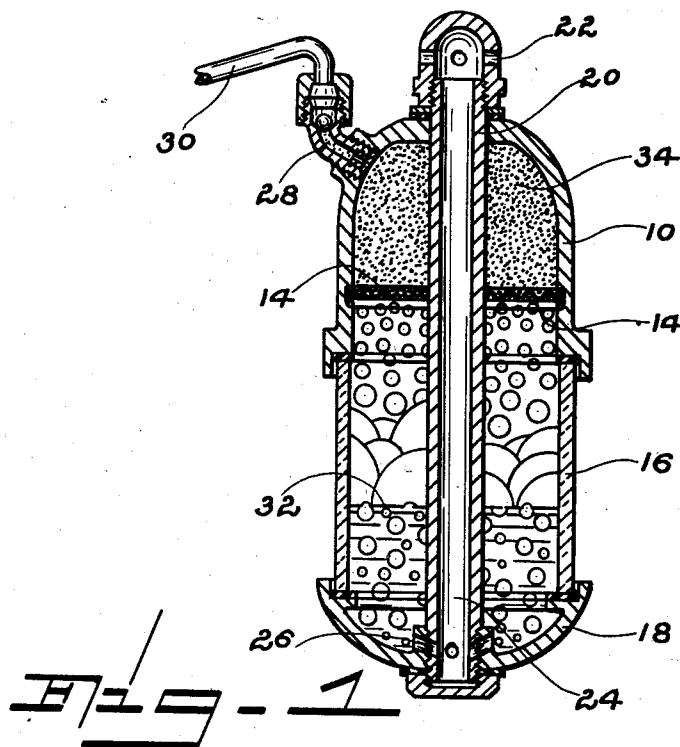
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METHOD OF INTRODUCING HIGHLY VOLATILE LIQUIDS INTO AN ENGINE CYLINDER.

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## UNITED STATES PATENT OFFICE

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## METHOD OF INTRODUCING HIGHLY VOLATILE LIQUIDS INTO AN ENGINE CYLINDER

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Our present invention relates to the art of internal combustion engines and more particularly to a method of introducing highly volatile liquids into an engine cylinder.

Internal combustion engines of the type ordinarily designated as gas engines operate by inducing into their combustion chamber in rapid succession an explosive mixture of air and liquid fuel. However, in recent years in the interest of general conservation of fuel the gasoline used in most gas engines has been getting increasingly less volatile. This makes starting much more difficult, particularly in cold weather and causes a mixture which in a motor that is just off its peak of condition to rapidly become more efficient. To counteract this condition many attempts have been made to introduce some of the well known highly volatile liquids of which motor ether may be taken as an example.

Many persons have used ether by mixing the same with the gasoline in the large gasoline tank provided. This has proven to be not only unsatisfactory but very dangerous. When a small amount of ether is put in a comparatively large gasoline tank which tank is vented out of necessity, it soon goes out of solution and is vaporized and lost. Further, when there is considerable space in the gasoline tank the volatilized ether and the fumes of the gasoline produce an extremely sensitive explosive mixture and many serious accidents have resulted from this use of ether. Therefore,

The purpose of our invention is to provide a method of introducing ether, or like volatiles, into the combustion chamber of a gasoline motor.

A further object is to provide means for introducing ether into a combustion chamber which provides a more or less uniform flow, at the same time almost entirely eliminating any hazard.

Other and more specific objects will be apparent from the following description taken in connection with the accompanying drawings, wherein

Figure 1 is a vertical sectional view showing a device which may be satisfactorily used in carrying out our method.

Figure 2 is an elevation showing the device of Figure 1 and its general relationship to a gasoline motor.

Referring to the drawings throughout which like reference characters indicate like parts, numeral 10 designates the vapor bowl which may be provided with a bracket suitable for bolting the same in place, as shown at 12. Disposed near the lower portion of dome 10 are a series of filter screens 14, whose purpose is to finally divide the oil vapor. As a matter of convenience so as to be able to tell definitely whether the device contains oil or not, we provide a transparent glass 16, which in turn is supported with the base member 18. A central tube member 20 is provided to hold the aforementioned members together in operative relationship and also to provide means for conducting air through the intake openings 22 down its central passageway 24 and out the discharge openings 26. Dome member 10 is provided at some convenient point with a discharge fitting 28 to which is suitably attached a section line 30 which is attached to the intake manifold of the motor the device is to serve.

*Method of operation*

It has been found that when ether or like high volatiles are introduced into the combustion chamber of a motor, extremely high temperature is maintained and to counteract this condition it has been found necessary to include with the ether introduced an amount of high flash lubricating oil which will make up for that destroyed by the additional heat. To accomplish our general results, therefore, it has been found necessary to use that class of device ordinarily referred to as an internal combustion chamber lubricator. There are many such devices well developed and on the market, most of which can be used for our purpose. However, it has been found that the so-called vaporized type is the most satisfactory. A typical example of the same is shown in section in Figure 1.

When such a device is used, high flash lubricating oil and ether are mixed in the proportions which trial indicates is most proper for the particular motor under trial, approxi-

mately 15 parts of oil and 1 part of ether or like fluid has been found very satisfactory. As the motor is turned over, particularly with the throttle closed, an increase suction is created on tube 30 which induces air in through the intake openings 22 down through the central tube of the device and out the discharge openings 26. Here the air is allowed to bubble up through the mixture of oil and fuel which is normally maintained at a level about as indicated at 32. The bubbles which form often quite large, quickly saturate the filtering screen 14 and as this is normally composed of several thicknesses of copper gauze or of felting included between screens; the air, in passing therethrough picks up, in mechanical suspension, the finely divided particles of oil and fuel producing in effect a saturated vapor within the cavity 34. In this manner the mixture is maintained at its proper relative balance, resulting in immediate introduction into the firing chamber of the highly volatile fuel so desired, together with the proper, predetermined lubricating oil, which will be sufficient to counteract its detrimental effects.

When used in this manner there is no danger from explosive hazard as the ether and oil do not readily form an explosive mixture as do gasoline and ether. Further, the container is sealed against the introduction of air except when under negative pressure; consequently there is no loss from vaporization into the atmosphere. And, lastly, by the introduction of the proper amount of a satisfactory type of oil, any detrimental effects of the ether are counteracted. In actual trials even old motors show a remarkably increased performance.

The foregoing description and the accompanying drawings are believed to clearly disclose a preferred embodiment of our invention but it will be understood that this disclosure is merely illustrative and that such changes in the invention may be made as are fairly within the scope and spirit of the following claims:

1. The method of introducing highly volatile fuel into an engine cylinder consisting of mixing the highly volatile fuel with a lubricant placing the same in an internal combustion chamber lubricator and connecting the outlet of said lubricator to the intake manifold of the motor.

2. The method of introducing highly volatile liquids into an engine cylinder consisting of mixing the highly volatile liquid with sufficient lubricant to counteract the fuel's detrimental effect in the engine cylinder, placing the same in an internal combustion chamber lubricator and connecting the outlet of said lubricator to the intake manifold of the motor.

3. The method of introducing highly volatile fuel into an engine cylinder consisting of

mixing the highly volatile fuel with a greater amount of lubricant so as to counteract the fuel's detrimental effect in the engine cylinder, placing the same in an internal combustion chamber lubricator and connecting the outlet of said lubricator to the intake manifold of the motor.

4. The method of introducing highly volatile fuels into an engine cylinder consisting of mixing the highly volatile fuel with a greater amount of lubricating oil adapted to counteract the fuel's detrimental effect in the engine cylinder, placing the same in an internal combustion chamber lubricator and connecting the outlet of said lubricator to the intake manifold of the motor.

In witness whereof we hereunto subscribe our names this 11th day of February, A. D. 1931.

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