U. G. KNAUFF.

ATTACHMENT FOR GAS ENGINES.

APPLICATION FILED OCT. 11, 1916.

1,261,554. Patented Apr. 2, 1918.

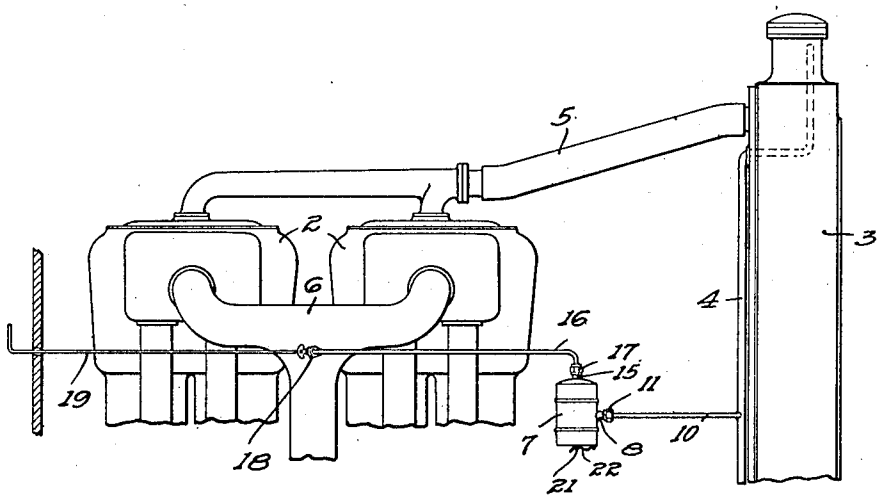


FIG. 1

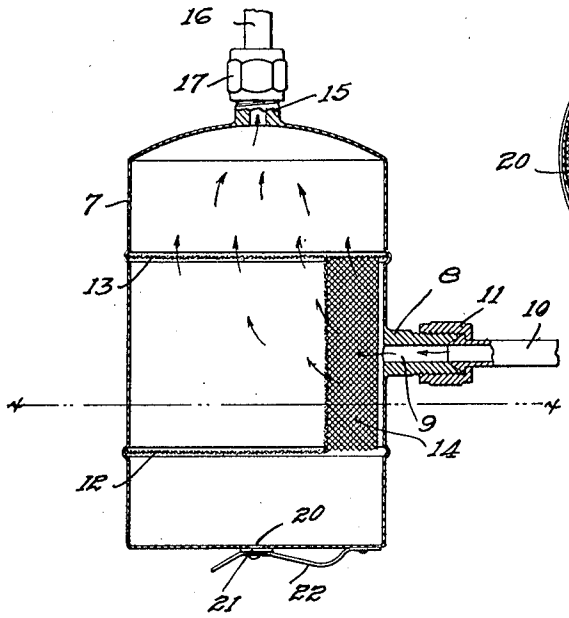


FIG. 2.

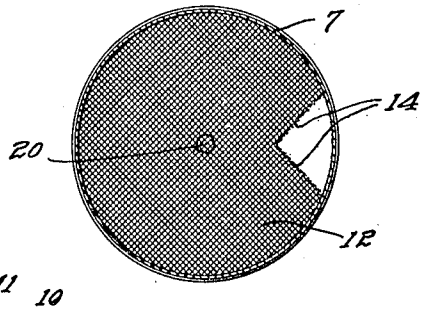


FIG. 3.

WITNESSES
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ATTACHMENT FOR GAS-ENGINES.

1,261,554. Specification of Letters Patent. Patented Apr. 2, 1918.

Application filed October 11, 1916. Serial No. 124,984.

To all whom it may concern:

Be it known that I, ULYSSES G. KNAUFF, a citizen of the United States, resident of Minneapolis, county of Hennepin, State of Minnesota, have invented certain new and useful Improvements in Attachments for Gas-Engines, of which the following is a specification.

The object of my invention is to provide improved means for conducting the vapor from the overflow pipe of a gas engine radiator or circulating system to the engine manifold to the end that this vapor will be mixed with the charge before entering the cylinder, thereby increasing combustion, the efficiency of the engine and economy in operation.

A further object is to provide an attachment for the purpose described of simple construction and one which can be easily applied to the overflow pipe and manifold.

The invention consists generally in various constructions and combinations, all as hereinafter described and particularly pointed out in the claims.

In the accompanying drawings forming part of this specification,

Figure 1 is a view representing a portion of a gas engine radiator and circulating system and the upper portion of the engine cylinders,

Fig. 2 is a detail sectional view of the vaporizing device disposed between the overflow pipe and the manifold,

Fig. 3 is a horizontal sectional view through the vaporizing device, taken on line *x*—*x* of Fig. 2.

In the drawing, 2 represents the engine cylinders and 3 the radiator having an overflow pipe 4 and a connection 5 with the jackets of the cylinders. 6 represents the intake manifold of the cylinders. 7 is a preferably cylindrical receptacle, having a nipple 8 on one side for a port 9 and connected with the radiator overflow pipe by a tube 10 and coupling 11. Within the receptacle screens 12 and 13 are provided, extending entirely across the interior of the can on opposite sides of the port 9 and between these screens I provide a third screen 14 which is preferably V-shaped in cross section and secured at its edges to the walls of the receptacle.

As shown in Fig. 3, the space between the screen 14 and the wall of the receptacle is open at the bottom, the screen 12 being cut away at this point. This is for the purpose of allowing particles of foreign material which may be drawn through the pipe 10 by the suction to drop down into the space beneath the chamber 12 where they will be prevented from mingling with the moist vapor that is passing through the screens 14 and 13 to the pipe 16. This angular or V-shape screen 14 has the particular function of preventing water in any considerable amount from being drawn through the vaporizer into the firing chamber. I have found that the shape of the screen shown is particularly efficient for this purpose. The upper end of the receptacle has a nipple 15 connected with the space above the screen 13 and a pipe 16 having a coupling 17 leads from the nipple 15 to the intake manifold 6 and is provided with a controlling valve 18 having an operating handle 19.

When the engine is started and the water circulating system begins to throw off a vapor, it will be drawn on the suction stroke of the engine through the receptacle 7 and the screens therein and into the manifold 6 and mixed with the charge from the carbureter, the moist vapor introducing a supply of oxygen into the charge and thereby producing a more complete combustion in the engine cylinders and increasing the efficiency of the engine while at the same time effecting a considerable saving in the use of fuel. I have found by actual test that a car with a given supply of gasolene will increase its mileage per gallon in a marked degree as soon as this attachment is provided and the vapor from the circulating system is introduced into the manifold. The meshes of the screens referred to are very fine, sufficient to obstruct the passage of water which might possibly be drawn out of the overflow pipe. As the vapor passes through the port 9, a portion of it will be deflected upwardly and a portion will pass through the screen 14 and flowing upwardly, engage with the meshes of the screen 13 and from thence pass to the pipe 16 and the manifold. In case of any condensation in the chambers within the receptacle 7, the water can be readily removed through a drip port 20 that is normally closed by a disk 21 on the spring 22.

The meshes of the screens are so fine that if any water is drawn into the can through the connection with the overflow pipe it will

be separated and while vapor will pass up through the top of the can and into the manifold, the water will collect in the bottom and may be drawn off when the disk 21 is opened to expose the port 20.

In various ways the details of construction herein shown and described may be modified and still be within the scope of my invention.

I claim as my invention:

1. The combination, with a vapor circulating pipe, of a receptacle interposed in said pipe and having inlet and outlet ports, screens mounted in said receptacle above and below the middle portion thereof and a screen interposed between said first named screens and opposite said intake port and adjacent the side wall of said receptacle, an unobstructed space being formed between the meshes of said screen adjacent said inlet port and the remote side wall of said receptacle and into which last named screen the vapor and water drawn through said intake port is projected.

2. The combination, with a vapor circulating pipe, of a receptacle interposed therein and having an inlet port near its middle portion and an outlet port at one end communicating with said pipe, screens of comparatively fine mesh mounted transversely in said receptacle upon opposite sides of said inlet port, and a screen, angular in cross section, disposed between said transverse screens and opposite said inlet port for compelling the vapor from said inlet port to pass therethrough.

3. A vapor separator comprising a casing having an inlet port near the middle portion thereof and a vapor pipe connection with said port, the upper end of said casing having an outlet port and a vapor pipe connected therewith, screens of comparatively fine mesh mounted transversely within said casing upon each side of said inlet port, a similar screen extending between said transverse screens across said inlet port and through which the vapor from said inlet port is discharged, the bottom of said casing having a draw-off port and a valve therefor.

4. A water vapor supply device for explosive engines including a closed receptacle having therein fine screen partitions, one above the other, said receptacle having an inlet port in its side wall between said screen partitions, a chamber being formed within said receptacle between the middle portions of said partitions that is unobstructed to the free flow of vapor therein, a vapor delivering tube communicating with said chamber between said partitions and a vapor tube leading from said receptacle at a point above the upper screen therein.

5. A water vapor supply device for explosive engines comprising a closed receptacle, and upper and lower screens extending transversely therein and spaced apart to form a chamber between them, the wall of said receptacle having an inlet port leading to the space between said screens, a third screen extending across said inlet port between said upper and lower screens, an opening being formed in said lower screen at the bottom of the chamber formed between said third screen and the wall of said receptacle, whereby particles of dirt and foreign material drawn in through said inlet port will be directed into the bottom of said receptacle beneath said lower screen, the vapor and moisture entering said inlet port passing through said third screen and said upper screen, and a vapor tube leading from said receptacle at a point above said upper screen.

In witness whereof, I have hereunto set my hand this 5th day of October 1916.

ULYSSES G. KNAUFF.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."