March 24, 1925. 1,530,882

A. V. CHAPIN

FUME UTILIZER

Filed July 21, 1923

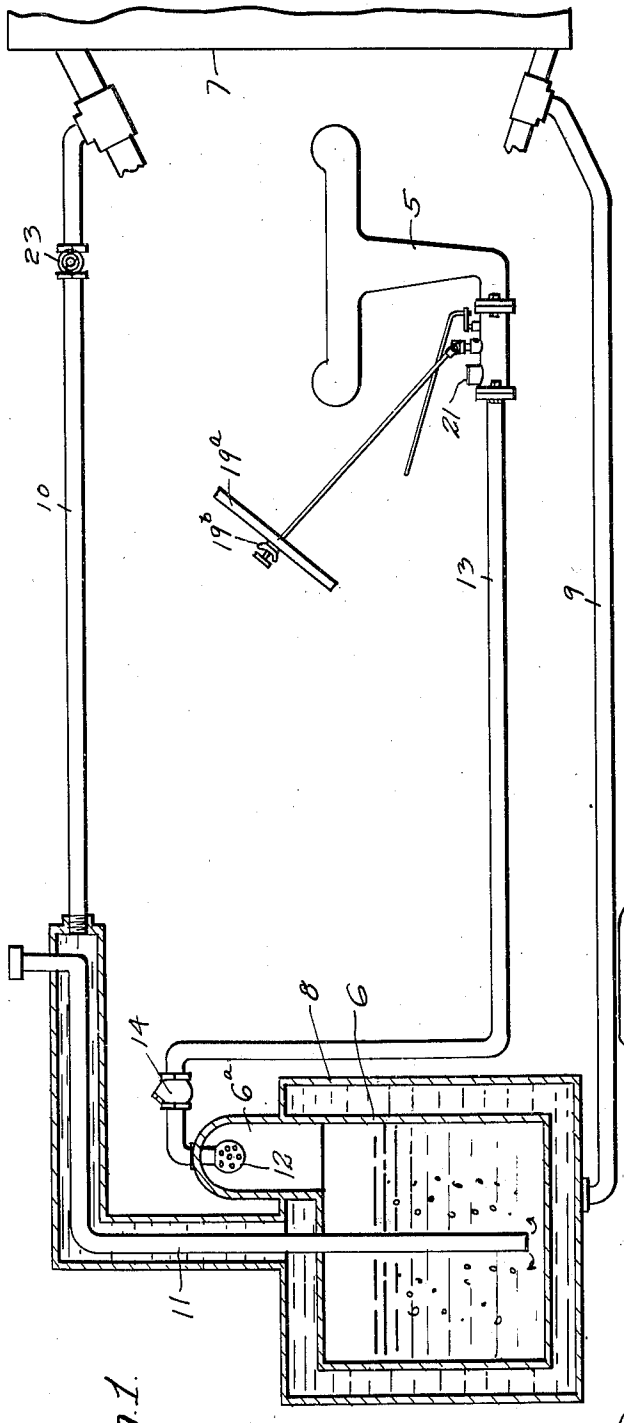


Fig. 1.

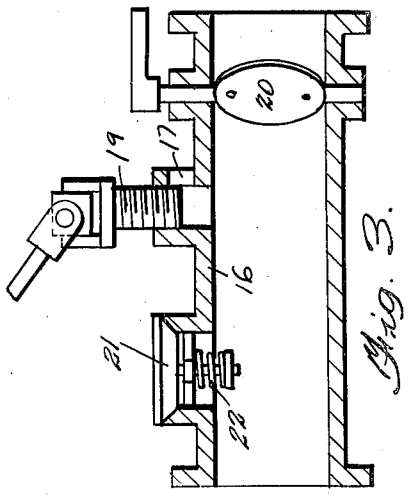


Fig. 3.

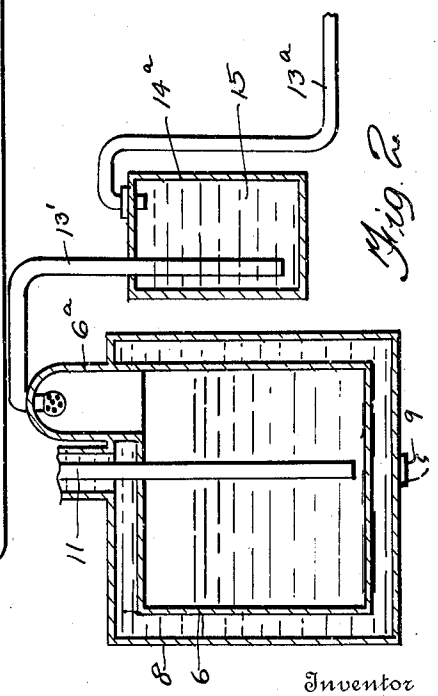


Fig. 2.

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UNITED STATES PATENT OFFICE.

ALFRED V. CHAPIN, OF ALLEN, KANSAS.

FUME UTILIZER.

Application filed July 21, 1923. Serial No. 652,991.

To all whom it may concern:

Be it known that I, ALFRED V. CHAPIN, citizen of the United States, residing at Allen, in the county of Lyon and State of Kansas, have invented certain new and useful Improvements in Fume Utilizers, of which the following is a specification.

This invention relates to a fume utilizer for internal combustion engines and it has for its object to provide an improved construction by means of which the usual carbureters used in internal combustion engines may be dispensed with, the spraying of gasoline into a column of air may be eliminated and the engine may be operated upon a carburetted vapor drawn directly from the main gasoline tank, whereby more efficient action and complete combustion of the charge is had.

Further objects and advantages of the invention will be set forth in the detail description which follows.

In the accompanying drawing:

Fig. 1 is a diagrammatic view illustrating the application of the invention;

Fig. 2 is a sectional view illustrating a fluid check for preventing back firing of the engine into the gasoline tank; and

Fig. 3 is a sectional view of a mixing and safety valve hereinafter described.

Like numerals designate corresponding parts in all of the figures of the drawing.

In the drawing 5 designates the intake manifold of an internal combustion engine, 6 the gasoline tank and 7 the radiator of an automobile. I prefer to water-jacket the gasoline tank, as indicated at 8, and to lead circulating pipes 9 and 10 into and from the water-jacket from the radiator so that the contents of the gasoline tank may be heated to cause them to readily vaporize and at the same time do this by means of a heating element which will present no danger of explosion or fire. An air pipe 11 leads into the gasoline tank and terminates adjacent the bottom thereof and air drawn through this pipe under the suction in the intake manifold 5 passes upwardly through the body of the liquid fuel, gasoline for instance, in the tank and reaches dome 6^a at the upper part of the tank in the form of a carburetted vapor. A baffle head 12 on the end of a feed pipe 13 prevents the gasoline from splashing into the feed pipe and permits the vapor to be drawn into the feed pipe by the suction in the manifold 5. A check valve 14 may be disposed in the pipe 13 and closes toward the tank 6 so that in the event of a back fire in the intake manifold 5 this check valve will close and prevent the back fire from finding its way into the gasoline tank. However, in Fig. 3 I have shown an alternative construction to be used in lieu of the check valve. In this case a section 13′ of the feed pipe leads into a tank 14^a containing a body of non-inflammable liquid 15 and a second section 13^a of the feed pipe leads out of the upper part of this tank. Thus the carburetted air from the tank 6^a must pass through the body of liquid in order to continue its travel toward the intake manifold through pipe 13^a and in the event of a back fire this body of liquid 15 acts as a check to prevent the flaming gases from reaching the gasoline tank. A mixing valve 16 is disposed in the length of the feed pipe 13 and comprises an air inlet port 17 the extent of opening of which is controlled by the adjustment of a screw 18, the latter being adjustable from the dash 19 of a motor vehicle by rod 19^a and lock nut 19^b. Thus the extent to which the current of carburetted vapor passing through pipe 13 may be diluted by air through port 13 may be controlled and a mixture of just the right degree of richness may be secured. A throttle valve is indicated at 20. A relief valve is indicated at 21 and in the event of a back fire this relief valve opens and permits the escape of the products of combustion but closes under the influence of spring 22 when the engine is operating in a normal manner and a suction exists in the line 13. A valve 23 disposed in the pipe 9 provides means for controlling the extent of the heating of the gasoline tank 6 by the circulating water of the engine.

I prefer to make the gasoline tank square in cross section so that a uniform area of surface will be exposed at the gasoline level irrespective of the amount of gasoline in the tank.

It is to be understood that the invention is not limited to the precise construction set forth but that it includes within its purview whatever changes fairly come within either the terms or the spirit of the appended claim.

Having described my invention what I claim is:

The combination with an internal combustion engine, its cooling system and its gaso-

line tank, of a water-jacket about the gasoline tank, connections between said water-jacket and the cooling system of the engine, an air supply leading into the gasoline tank and terminating adjacent the bottom thereof, a feed line leading from the upper part of the gasoline tank to the intake manifold of the engine and a fitting in said feed line carrying a throttle valve, and air inlet valve and a relief valve.

In testimony whereof I affix my signature in the presence of two witnesses.

ALFRED V. CHAPIN.

Witnesses:
B. J. BOYLE,
O. C. CHAPIN.