May 16, 1944. F. H. SHARAR 2,349,116

CHARGE FUMING DEVICE

Filed March 1, 1943 3 Sheets-Sheet 1

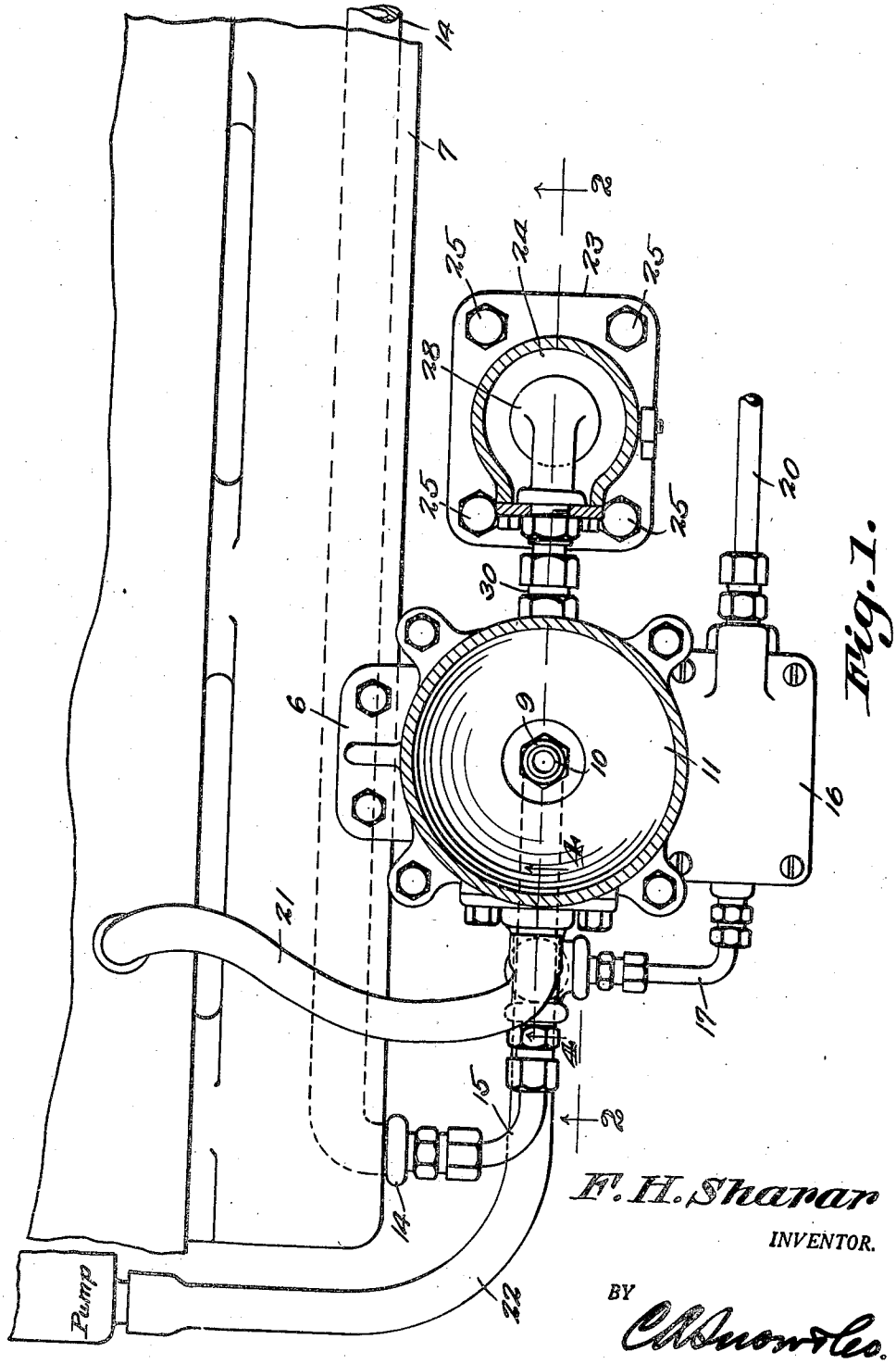


Fig. 1.

F. H. Sharar

INVENTOR.

BY Albert Leo.

May 16, 1944. F. H. SHARAR 2,349,116

CHARGE FUMING DEVICE

Filed March 1, 1943 3 Sheets-Sheet 2

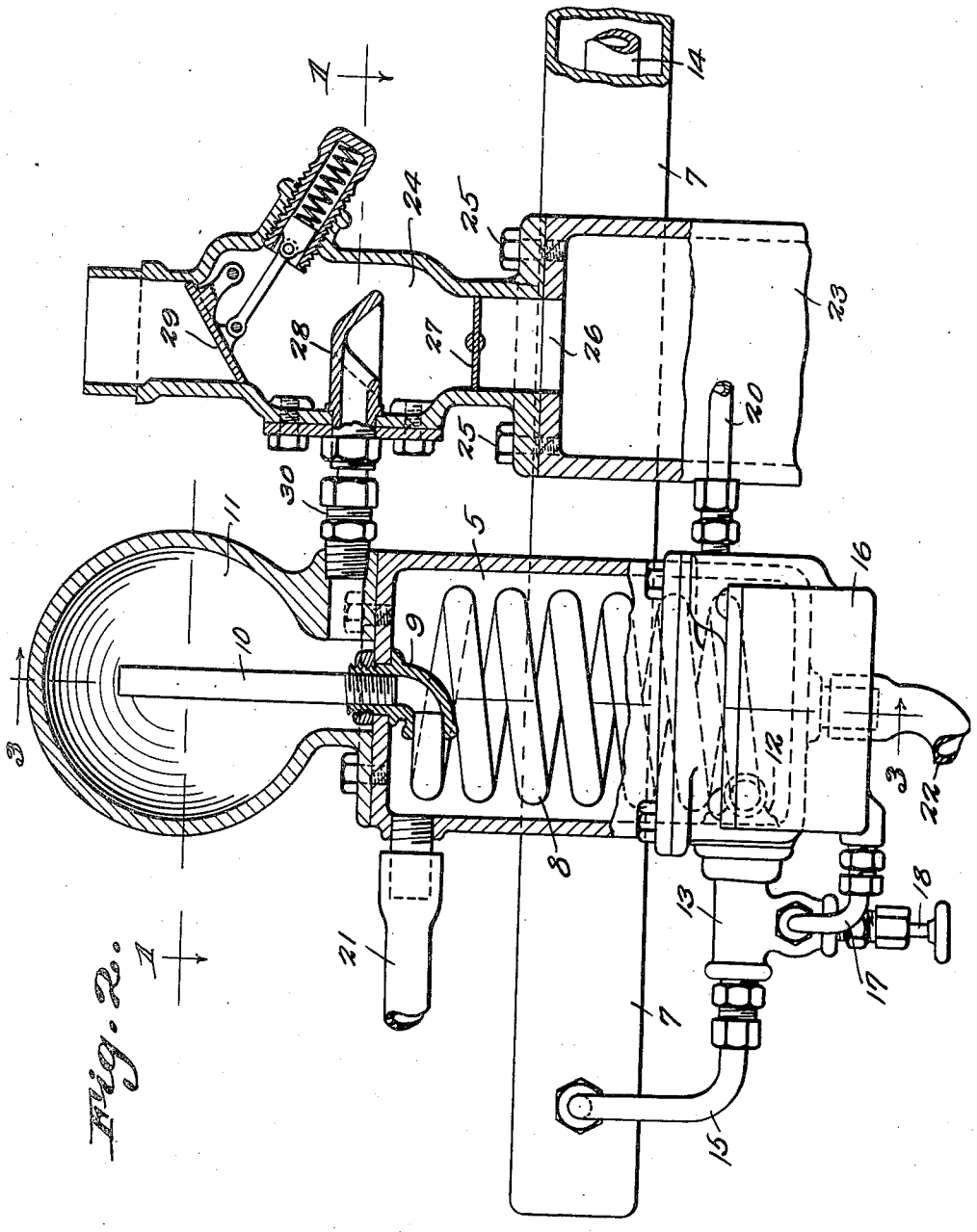


Fig. 2.

F. H. Sharar INVENTOR.

BY C. A. Snow & Co.

May 16, 1944. F. H. SHARAR 2,349,116

CHARGE FUMING DEVICE

Filed March 1, 1943 3 Sheets-Sheet 3

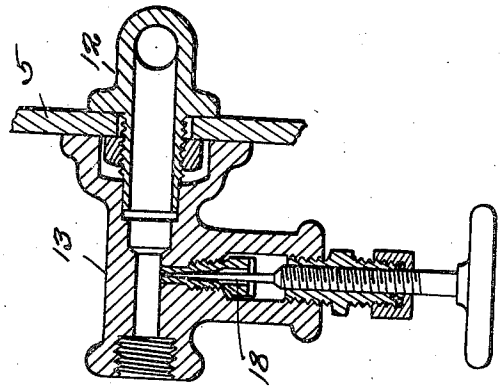


Fig. 4.

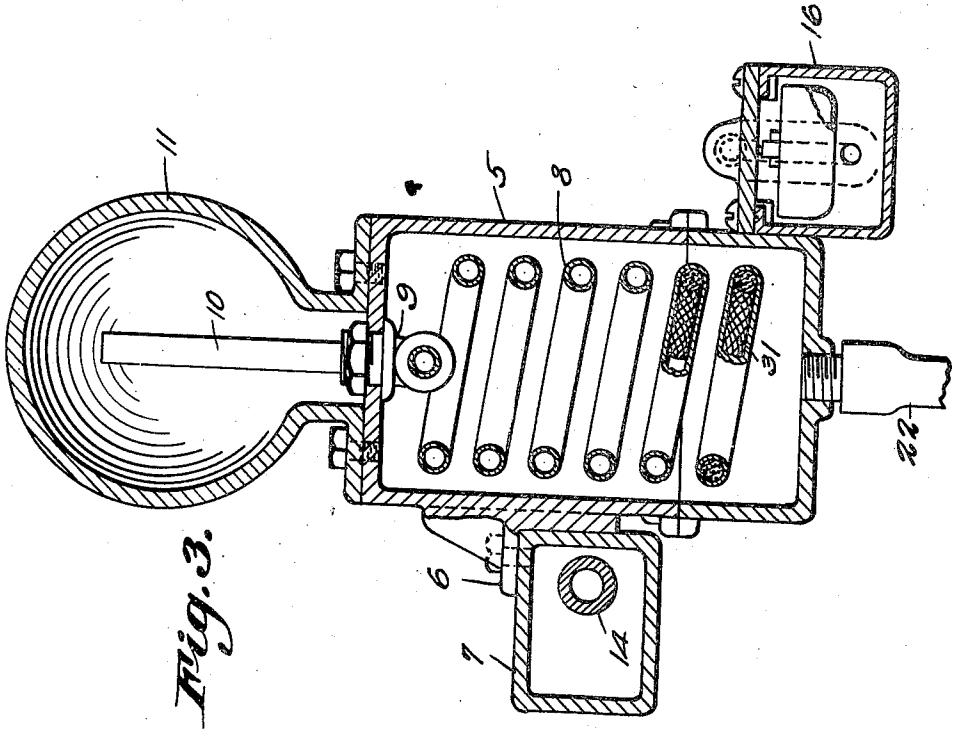


Fig. 3.

F. H. Sharar INVENTOR.

BY A. Brownlee

Patented May 16, 1944 2,349,116

UNITED STATES PATENT OFFICE

2,349,116

CHARGE FUMING DEVICE

Fred H. Sharar, Williamsport, Pa.

Application March 1, 1943, Serial No. 477,619

5 Claims. (Cl. 123—133)

This invention relates to fuel systems designed for use with internal combustion engines, the primary object of the invention being to provide means for utilizing the heat of the engine to atomize or fume the fuel, prior to the introduction of the fuel into the intake manifold of the engine, whereby the efficiency of the engine will be increased appreciably, with a decided decrease in fuel consumption.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein described, may be made within the scope of what is claimed, without departing from the spirit of the invention.

Referring to the drawings:

Figure 1 is a sectional view taken on line 1—1 of Figure 2.

Figure 2 is a sectional view taken on line 2—2 of Figure 1.

Figure 3 is a sectional view taken on line 3—3 of Figure 2.

Figure 4 is a sectional view taken on line 4—4 of Figure 1.

Referring to the drawings in detail, the reference character 5 designates the water chamber of the device, which is provided with a bracket 6, by means of which the device is bolted to the exhaust manifold of an internal combustion engine, the exhaust manifold being indicated by the reference character 7. Disposed within the water chamber 5 is a coil 8 which connects with the union 9 that extends through the top of the water chamber 5 the upper end of the union 9 being threaded to receive the lower end of the pipe 10 which extends into the hollow spherical fume storage tank 11. The lower end of the coil 8, connects with the coupling 12 which extends through the wall of the water chamber 5, at a point adjacent to the bottom thereof.

The reference character 13 designates a valve which is connected with the coupling 12, the valve 13 being connected with the pipe 14 which is extended through the exhaust manifold 7, by means of the pipe 15. Air is supplied to the system, through the pipes 14 and 15 and the valve 13. Supported adjacent to the lower end of the water chamber 5, is a fuel float chamber 16 which is in communication with the valve 13, through the pipe 17. The needle valve 18, which extends into the valve 13, controls the passage of fuel into the valve 13, the fuel being drawn into the valve 13, by the suction caused by the air passing through the horizontal passageway 19. Fuel is fed to the float chamber 16, through the pipe 20, leading from the fuel supply tank, not shown.

The pipe 21 connects with the hot water jacket of the internal combustion engine, and supplies hot water to the water chamber 5, at the top of the water chamber. The pipe 22, which communicates with the water chamber 5 at a point adjacent to the lower end thereof, is the return pipe for the hot water, so that hot water will circulate through the water chamber during the operation of the engine, to heat the coil 8.

The intake manifold of the engine is indicated by the reference character 23, which provides a support for the mixing chamber 24 which is bolted to the intake manifold, by means of the bolts 25. The mixing chamber communicates with the intake manifold, through the opening 26, the passage of the fuel into the intake manifold, being regulated by the valve 27, the valve 27 constituting the throttle valve of the engine.

The reference character 28 designates the fuel spray nozzle, and as shown, this nozzle is hollow and substantially cone-shaped in construction, the nozzle extending to the central portion of the mixing chamber 24 so that it is within the direct path of travel of air entering the mixing chamber 24, past the spring pressed valve 29.

The nozzle 28 connects with the fume storage tank 11, through the pipe 30 which is disposed adjacent to the bottom of the fume storage tank 11, as clearly shown by Figure 2 of the drawings.

Disposed within the coil 8 is a shredded copper filament 31 comprising loosely woven copper wire strands, which act to impede the passage of any vaporized matter which, when contacted by the swiftly moving air will be converted into fumes.

In the operation of the device, the pipe 14 becomes heated by the exhaust gases passing through the exhaust manifold 7 which surrounds the pipe 14, creating a vacuum within the mixing chamber resulting in hot air being drawn through the pipe 14 and valve 13. As the liquid fuel enters the valve 13, through the needle valve, the fuel is drawn into the coil 8, in vaporized form and is converted into atoms by the swift moving hot air. As the air enters the filament disposed within the coil, the passage of the small atoms is retarded, and due to the heated coil, and the swiftly moving hot air, the atoms are converted into fumes.

The fumes now pass into the nozzle 28, where they are spread. As the air is drawn into the mixing chamber through the check valve and

contacts the fumes, the fumes are instantly consumed, converting the same into a compressible gas. The charge is now drawn into the cylinder and compressed and ignited in the usual and well known manner.

What is claimed is:

1. A charge forming device comprising a water chamber adapted to be secured to the exhaust manifold of an internal combustion engine, and through which hot water is circulated, a vertical coil mounted within the water chamber, means for delivering fuel to said coil, an air inlet pipe extending through the exhaust manifold of the engine, and adapted to feed heated air to said coil where the fuel is converted into fumes as it passes through the coil, a fume storage tank mounted on the water chamber, a pipe extending from the discharge end of the coil and adapted to discharge fumes into said fume storage tank, a mixing chamber adapted to be secured to the intake manifold of the internal combustion engine, and being in communication therewith, a pipe leading from said fume storage tank and adapted to supply fumes to the mixing chamber in the path of travel of air passing into the mixing chamber, mixing with the air providing a higher combustible fuel mixture.

2. A charge forming device comprising a heating chamber adapted to be secured to the exhaust manifold of an internal combustion engine to be heated thereby, a vertical coil mounted within the heating chamber and through which heated fuel is fed, converting the fuel into fumes, a spherical fume storage tank mounted in the heating chamber, a pipe connected with the coil and extending into the fume storage tank, the discharge end of the pipe terminating adjacent to the top of the storage tank, a mixing chamber, a pipe establishing communication between the fume storage tank and mixing chamber and adapted to deliver fumes to said mixing chamber, a nozzle on the discharge end of the latter pipe and adapted to deliver fumes into the path of travel of air passing through the mixing chamber forming a highly combustible fuel mixture.

3. A charge forming device comprising a water chamber adapted to be secured to the exhaust manifold of an internal combustion engine, a vertical coil within the water chamber, means for admitting hot water to the water chamber, heating the coil, means for directing liquid fuel to the coil converting the fuel into fumes, a fume storage tank mounted on the water chamber and adapted to receive fumes from said coil, a mixing chamber, a nozzle through which fumes pass from the fume storage tank to said mixing chamber in the path of travel of air entering the mixing chamber, and a valve for controlling the passage of combustible fuel from the mixing chamber to the engine.

4. A charge forming device comprising a water chamber adapted to be secured to the exhaust manifold of an internal combustion engine, a vertical coil disposed within the water chamber and through which fuel passes, means for directing hot water to the water chamber converting the fuel into fumes, a fume storage tank, means for directing the fumes from the coil to the upper portion of the storage tank, said storage tank having an outlet opening adjacent to the bottom thereof, a pipe extending into the outlet opening, a nozzle having a hollow cone-shaped portion, connected with the latter pipe and adapted to direct fumes from the fume storage tank downwardly, a mixing chamber in which the nozzle is mounted, said mixing chamber having an air opening through which air is drawn past the nozzle providing a hightly combustible fuel, and a valve for controlling the passage of fuel through the mixing chamber.

5. A charge forming device comprising a water chamber adapted to be secured to the exhaust manifold of an internal combustion engine, a coil mounted within the water chamber, means for directing hot water to the chamber heating the coil, means for directing liquid fuel to the coil, means for delivering hot air to the fuel prior to its entrance to the coil, a hollow spherical fume chamber supported on the water chamber and into which fumes are directed, a mixing chamber, a nozzle adapted to direct fumes from the fume chamber to the mixing chamber, a valve for controlling the passage of air through the mixing chamber, past said nozzle mixing the fumes and air and providing a highly combustible fuel mixture, and means for controlling the passage of fuel from said mixing chamber.

FRED H. SHARAR.