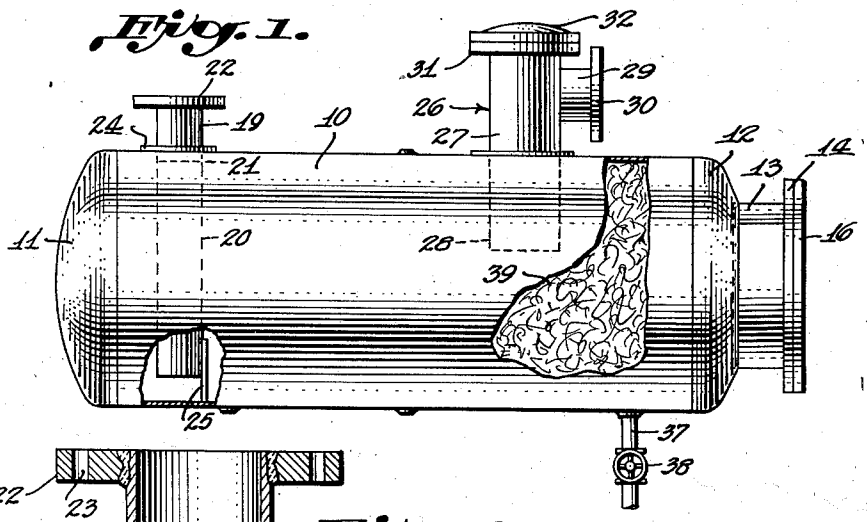
Nov. 21, 1944. W. LEWIS 2,363,009

WATER SEPARATOR

Filed Sept. 18, 1942

Fig. 1.



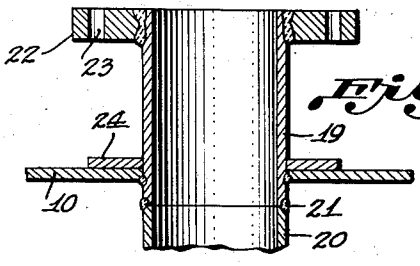


Fig. 2.

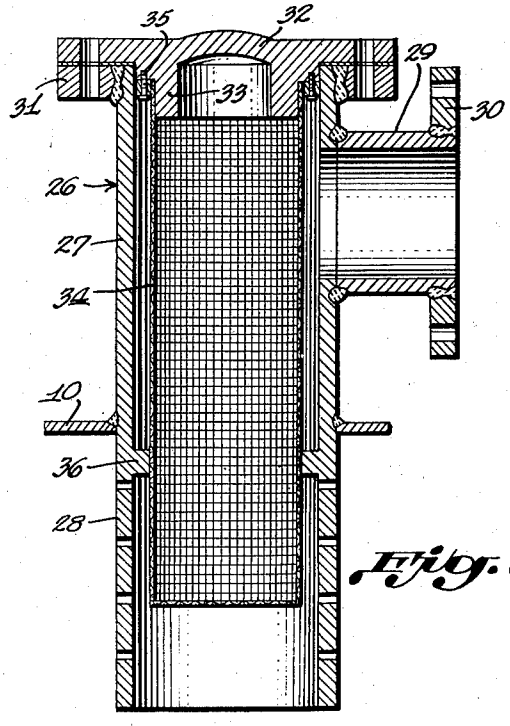
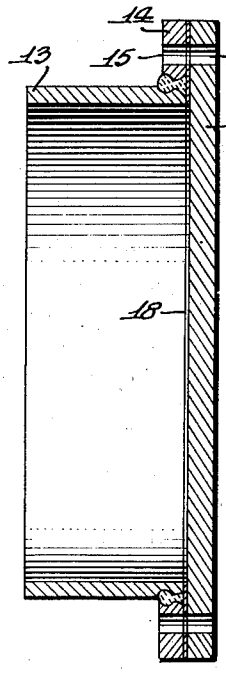


Fig. 3.

Fig. 4.



Inventor

WARNER LEWIS

By Ben Cohen

Attorney

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UNITED STATES PATENT OFFICE

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WATER SEPARATOR

Warner Lewis, Tulsa, Okla.

Application September 18, 1942, Serial No. 458,849

2 Claims. (Cl. 210—131)

This invention relates to a device adapted to be inserted in a gasoline dispensing pipe line for the purpose of removing water and other impurities from the gasoline.

It has been found that stalling of gasoline or other engines using gasoline as their fuel has been in large part due to the presence of water in the gasoline. Such stalling when occurring in an automobile engine will merely cause some inconvenience to the motorist but when occurring in an airplane engine may prove fatal. Therefore, a great need exists at the present time for a device that will solve the above problem. Numerous attempts have been made in the past to eliminate water from gasoline but none have proven entirely successful. Tests made with previous devices now on the market have shown up to eighty percent efficiency but this will not entirely eliminate stalling airplane motors. Tests made with the device of the present invention has shown efficiency above ninety nine percent. It is therefore a principal object of the present invention to provide a combined filter and strainer which will substantially eliminate all water from gasoline.

A further object of the present invention is to provide a water separator which can be installed in existing pipe lines thereby eliminating the necessity of providing special pipe lines.

Another object of the invention is the provision of a water separator which is of relatively simple construction, which may be economically manufactured and which is particularly adapted to easy renewal of various parts.

Other and further important objects of the invention will be apparent from the following description taken in connection with the accompanying drawing, in which

Figure 1 is an elevational view of a combined filter and strainer tank having a part of the tank broken away to show the filtering medium.

Figure 2 is a detailed sectional view of the inlet portion of the tank.

Figure 3 is a detailed sectional view of the outlet portion of the tank.

Figure 4 is a detailed sectional view of the manhole construction.

Referring to the drawing in detail, there is illustrated a combined filter and strainer tank generally indicated by the numeral 10. Tank 10 has a closed head 11 at one end and a head 12 at the other end. Head 12 has a manhole construction comprising a rim 13 to which a ring 14 is welded. Ring 14 is provided with a plurality of spaced bolt receiving openings 15. A manhole cover 16 having correspondingly spaced openings 17 is adapted to be bolted to ring 14. A flat sealing gasket 18 is interposed between ring 14 and cover 16 to prevent any leakage of gasoline through the manhole opening.

An inlet tubing 19 is provided at one end of the tank adjacent the closed head and has a pipe 20 welded thereto at 21. The pipe 20 extends into the tank and terminates at a point closely adjacent the bottom of the tank. A ring 22 having a plurality of bolt receiving openings 23 is welded to the outer end of tubing 19 and is adapted to be connected to a portion of a pipe line, not shown. A ring 24 surrounds tubing 19 and serves as a reinforcing member. A baffle plate 25 is secured at the lower end of pipe 20 and serves to reverse the flow of the gasoline thereby increasing the path of the circulating fluid.

An outlet fitting, generally indicated by numeral 26, is provided at the opposite end of the tank from the inlet opening. Fitting 26 comprises a pipe having an upper portion 27 and a perforated portion 28 extending a short distance into the tank. An outlet pipe 29 extends laterally from upper pipe portion 27 and has a ring 30 welded thereto. Ring 30 is adapted to be bolted to another portion of the pipe line previously mentioned in order to continue the flow of the gasoline. A ring 31 is welded to the upper end of pipe portion 27 and receives a removable cover 32 which seals off the upper end of pipe 27. Cover 32 is provided with a depending rim portion 33 spaced from pipe portion 27 and has mounted thereon a strainer element in the form of a screen 34 secured to the cover by means of bolts 35. Integrally formed ring 36 spaces the lower end of the strainer element 34 from perforated pipe portion 28.

At the lower portion of the tank adjacent the manhole opening, there is provided a drain outlet pipe 37 controlled by valve 38. Valve 38 may be either manually operated or may be automatically controlled in connection with an accumulator or other known mechanical devices.

Numeral 39 indicates the filtering medium which entirely fills the inside of tank 10. The filtering material used in the present invention is poplar excelsior which has a particular affinity for water globules, either free or emulsified. Excelsior, microscopically, has millions of "feelers" which wipe the water out of the stream. Due to the fact that gasoline has a lower specific gravity than water and other impurities carried in commercial gasoline, the gasoline will flow towards the upper part of the tank and out through

the strainer element, while the water and impurities sink to the bottom of the tank where it is drawn off through outlet pipe 37 either manually or automatically. Although experiments have shown that poplar excelsior is particularly adaptable for water separation as described above, any other filtering medium having an affinity of water may be used in the present invention.

In the use of this invention, the tank is installed in the ordinary pipe line adjacent the delivery end of the pipe line and the gasoline flows through the inlet pipe, through the filtering medium and out through the strainer element and outlet pipe. As the gasoline circulates through the filtering medium, the water in the stream is separated from the gasoline and is drawn off through outlet drain pipe 37. The filtered gasoline passes through strainer element 34 which completely removes any particles of excelsior or other impurities from the gasoline and then out through outlet pipe 29. It will be noted that the construction of the strainer housing is such that cover 32 can be readily removed carrying strainer element 34 with it so that the strainer can be cleaned or replaced if worn out. Manhole cover 16 is also readily removable in order to renew the filtering material when it becomes clogged up and loses its efficiency.

Thus it will be seen that the construction herein shown and described is well adapted to accomplish the objects of the invention. It will be understood, however, that the invention may be embodied otherwise than here shown and that in the form illustrated, certain minor changes may be made without departing from the spirit of the invention. Therefore, I do not wish to be limited precisely to the construction herein shown except as may be required by the appended claims considered with reference to the prior art.

Having thus described the invention, what is claimed is:

1. A water separator adapted to be inserted in a gasoline pipe line comprising a closed horizontal tank having an inlet and an outlet adjacent opposite ends of the tank, said inlet pipe terminating adjacent the bottom of the tank, a filtering medium in said tank consisting of poplar excelsior, said filtering medium being of uniform density throughout the cross-section of the tank and occupying a sufficient longitudinal portion of the tank to effectively remove the water from the gasoline, and means adjacent the lower end of the inlet pipe to deflect the gasoline away from the outlet opening whereby to increase the path of the flow of the gasoline through the filtering medium.

2. A water separator adapted to be inserted in a gasoline pipe line comprising a closed horizontal tank having an inlet and an outlet adjacent opposite ends of the tank, said inlet pipe terminating adjacent the bottom of the tank, a filtering medium in said tank consisting of poplar excelsior, said filtering medium being of uniform density throughout the cross-section of the tank and occupying a sufficient longitudinal portion of the tank to effectively remove the water from the gasoline, a baffle secured to the lower end of the inlet pipe and to the bottom of the tank whereby to deflect the gasoline away from the outlet opening, and drain means at the lower end of the tank adjacent the outlet opening to drain off the separated water.

WARNER LEWIS.