

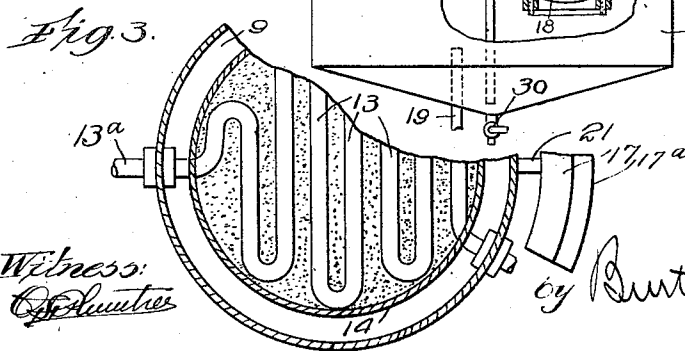
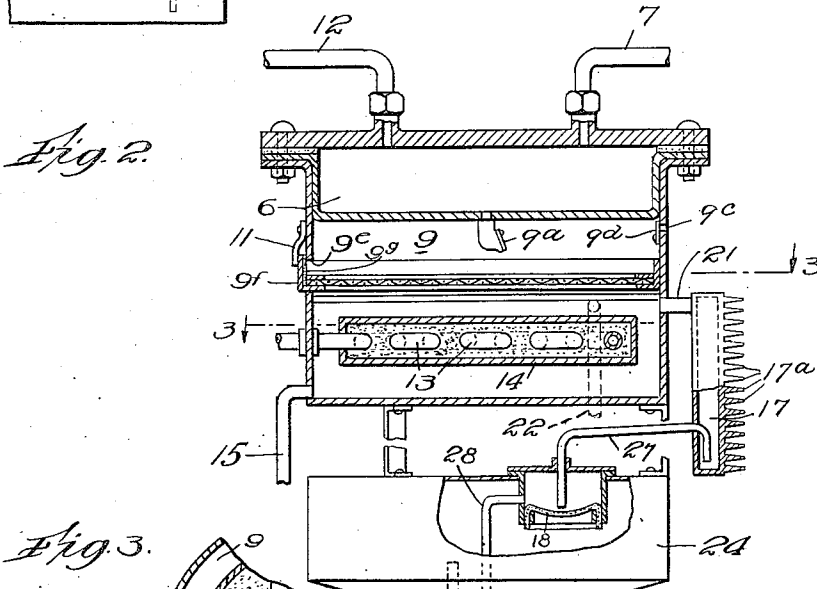
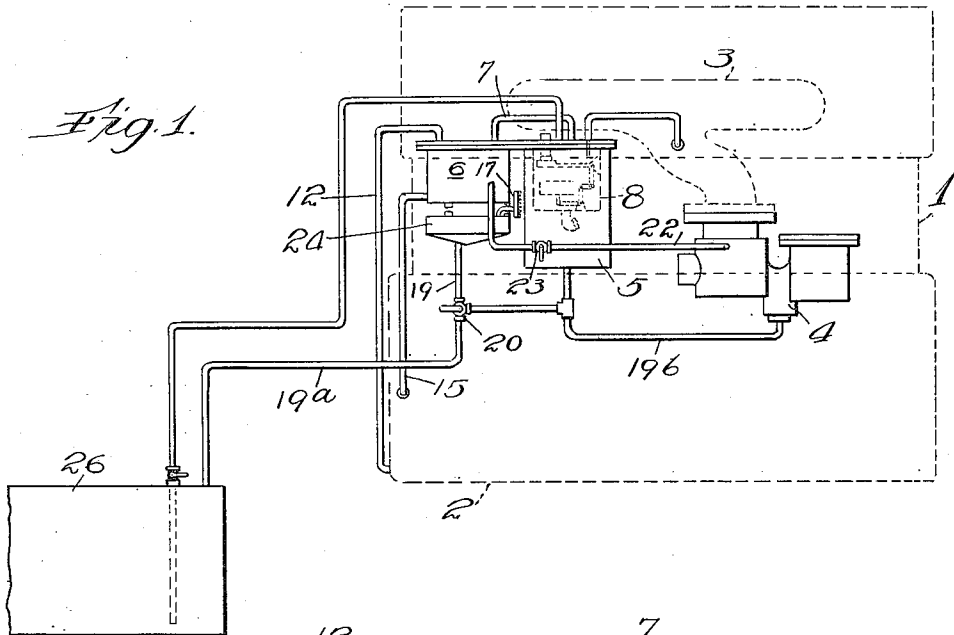
W. JAY.

DEVICE FOR WITHDRAWING AND SEPARATING THE LIQUID CONTENTS OF THE CRANK CASE OF
AN INTERNAL COMBUSTION ENGINE.

APPLICATION FILED FEB. 7, 1917.

1,235,898.

Patented Aug. 7, 1917.



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UNITED STATES PATENT OFFICE.

WEBB JAY, OF CHICAGO, ILLINOIS.

DEVICE FOR WITHDRAWING AND SEPARATING THE LIQUID CONTENTS OF THE CRANK-CASE OF AN INTERNAL-COMBUSTION ENGINE.

1,235,898.

Specification of Letters Patent.

Patented Aug. 7, 1917.

Application filed February 7, 1917. Serial No. 147,227.

To all whom it may concern:

Be it known that I, WEBB JAY, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented new and useful Improvements in Devices for Withdrawing and Separating the Liquid Contents of the Crank-Cases of Internal-Combustion Engines, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The purpose of this invention is to provide an improved device adapted for the purpose of withdrawing liquid fuel from the crank case of an internal combustion engine when for any reason such liquid fuel has accumulated therein by passing the pistons, said device being adapted also for withdrawing lubricating oil from the crank case for the purpose of filtering and cleansing the same and returning it thereto. It consists in the elements and features of construction shown and described, as indicated in the claims.

In the drawings:—

Figure 1 is a diagrammatic presentation of the several elements constituting and concerned in the operation of this invention, in their relation to the engine of an automobile.

Fig. 2 is a vertical axial section of the receptacle which constitutes the essential part of this invention together with its appurtenances.

Fig. 3 is a section at the line, 3—3, on Fig. 2.

The drawings show in connection with the engine of an automobile represented at 1, and having the crank case indicated at 2, the intake manifold at 3, and the carbureter at 4, a vacuum fuel feed device indicated in its general outlines at 5, and a receptacle, 6, which constitutes with associated chambers the distinguishing part of this invention.

The receptacle, 6, has connections for alternately producing and relieving a partial vacuum therein, said connections in the construction illustrated, consisting of a conduit, 7, leading from the upper part of said receptacle to the partial vacuum chamber, 8, of the vacuum fuel feed device, shown in outline or conventionally at 5. It will be understood without further specific explanation that the alternation of conditions of partial vacuum and normal atmospheric pressure in the partial vacuum chamber, 8,

of the vacuum fuel feed device, is produced by any one of the methods which is familiar in this class of devices. The conduit connecting said partial vacuum chamber with the receptacle, 6, is always open, and thereby the condition of the partial vacuum chamber, 8, is reproduced in the receptacle, 6, without other specific means for this purpose. The receptacle, 6, receives liquid from a pipe, 12, from the lower part of the crank case, and communicates downwardly with a chamber, 9, for delivery of the liquid contents of the receptacle, 6, into said chamber, 9, a check valve, 9^a, being provided at the discharge, which check valve is adapted to be opened by gravity flow of the liquid from the receptacle, 6, into the chamber, 9, and to be seated by the suction alternately operating in said receptacle, 6. Said chamber, 9, has an atmosphere inlet at 9^c, which is preferably provided with a check valve, 9^d, opening inwardly and adapted to be held seated by any pressure which may be developed in said chamber in excess of atmospheric pressure. In said chamber, 9, below the point of delivery of the liquid thereinto from the receptacle, 6, there is located a filtering member, 10, designed and adapted for separating solid foreign substances from the liquid. This filtering member may be of any material suitable for that purpose, such as woven-wire cloth and the like. It is preferably formed as a slide, comprising a frame upon which the filtering cloth is mounted and stretched, said slide being insertible into its operative position in said chamber through a lateral opening, 9^e, in the chamber wall, so that it may be readily withdrawn for cleansing, suitable means being provided for adapting it to close air-tight the opening through which it is inserted, such as providing its head or outer end, 9^f, with a compressible facing, 9^g, seating against the outer surface of the chamber, and providing a button, 11, for holding it tightly closed.

In the chamber, 9, below the filtering slide member, 10, there is mounted a heating member, 13, which is most conveniently formed by extending a branch, 13^a, of the engine exhaust pipe through said chamber, 9, and inclosing it within said chamber in a partly insulating sleeve, 14, filling the inter-space between said sleeve and pipe with asbestos or like insulating material. From

the lower part of the chamber, 9, a conduit, 15, leads back to the engine crank case, discharging thereinto at a level above the point at which the pipe leads therefrom. From a higher point in said chamber, 9, a vapor conduit, 21, leads therefrom, said conduit discharging ultimately in a receptacle, 24, which may be a chamber formed unitarily with the chamber, 9, below the bottom of said chamber, 9, and is so illustrated. Said vapor conduit comprises intermediate its connection with the chamber, 9, and its discharge connections with the chamber, 24, a condenser, 17, which as illustrated, is merely a chamber or passage having a large radiating surface as indicated at 17^a, adapted thereby to cause the gasolene vapor which may be separated by the heat of the heating member, 13, from the liquid discharged into the chamber, 9, to be condensed on the way to the chamber, 24, and to be delivered into said chamber in liquid condition. Some vapor of water may also accompany the gasolene vapor and be condensed on the way to the chamber, 24. For the purpose of quickly separating the gasolene from the water, the familiar expedient of straining the mixture of gasolene and water through a chamois screen is employed, and for that purpose there is shown such a chamois screen or filter, 18, mounted in the upper part of the chamber, 24, forming a pocket into which the mouth of the siphon discharge pipe, 27, from the condenser, 17, dips, so that the liquid delivered through said mouth makes impact on the chamois pocket with the result that the gasolene, although lighter than the water, goes through the chamois, while the water is detained, and overflows the margin of the chamois, escaping through a pipe, 28, which terminates near the bottom of the chamber, 24. The gasolene contents of the chamber, 24, arriving therein by passing through the chamois screen, passes out by the pipe, 19, which opens in the chamber, 24, and a distance above the bottom judged adequate to afford a sufficient trappage for the water which may accumulate therein, and which may be drawn off through cock, 30. The gasolene passing out through the pipe, 19, may be conveyed either back to the gasolene supply tank, 26, or to the carbureter, as indicated by the pipes, 19^a and 19^b, respectively, a three-way valve, 20, being provided at the point at which the conduit branches for one discharge or the other.

It will be readily understood that the vacuum fuel feed device is not a necessity to this invention but that when it is present, its partial vacuum chamber may be utilized in the manner above described for maintaining the partial vacuum and atmospheric pressure in the chamber, 6; and it will be obvious that in the absence of the vacuum fuel feed device, other means than the con-

nection described between the chamber, 6, and the partial vacuum chamber of said vacuum fuel feed device may be employed for producing the alternation of partial vacuum and atmospheric pressure in the chamber, 6.

It will be obvious that the condensing of the vaporized gasolene may be dispensed with, the condenser being in that case omitted, and the gasolene vapor conducted directly to the carbureter, as indicated by a pipe, 22, which may be present, even when the condenser is employed, but being provided with a shut-off valve, 23, to be closed when it is preferred to condense the gasolene vapor before returning it to the path of service in the engine.

I claim:—

1. In combination with an internal combustion engine, a liquid receptacle at a higher level than the crank case of such engine; connections for alternately producing and relieving a partial vacuum in the upper part of such receptacle; a conduit from the lower part of the crank case discharging into said receptacle; a chamber into which said receptacle discharges its liquid contents; a heating member in said chamber; a liquid conduit from the lower part of said chamber leading back to the crank case, and a vapor conduit leading from the upper part of said chamber.

2. In combination with an internal combustion engine, a liquid receptacle at a higher level than the crank case of such engine; connections for alternately producing and relieving a partial vacuum in the upper part of such receptacle; a conduit from the lower part of the crank case discharging into said receptacle; a chamber into which said receptacle discharges its liquid contents; a branch of the engine exhaust pipe extending through said chamber; a liquid conduit leading from the lower part of said chamber, and a vapor conduit leading from the upper part thereof.

3. In combination with an internal combustion engine, a liquid receptacle at a higher level than the crank case of such engine; connections for alternately producing and relieving a partial vacuum in the upper part of such receptacle; a conduit from the lower part of the crank case discharging into said receptacle; a chamber into which said receptacle discharges its liquid contents; a heating member in said chamber; a liquid conduit leading from the lower part of said chamber back to the crank case; a vapor conduit leading from the upper part of said chamber; a liquid fuel receptacle to which said vapor conduit leads, and a condenser interposed in said conduit.

4. In combination with an internal combustion engine, a liquid receptacle at a higher level than the crank case of such en-

gine; connections for alternately producing and relieving a partial vacuum in the upper part of such receptacle; a conduit from the lower part of the crank case discharging into said receptacle; a chamber into which said receptacle discharges its liquid contents; a heating member in said chamber; a liquid conduit leading from the lower part of said chamber back to the crank case; a vapor conduit leading from the upper part of said chamber; a receptacle to which said vapor conduit leads; a filtering partition in said receptacle adapted to separate the condensed water and condensed liquid fuel, and discharge conduits leading respectively from above and from below said filtering partition.

5. In combination with an internal combustion engine, a liquid receptacle at a higher level than the crank case of such engine; connections for alternately producing

and relieving a partial vacuum in the upper part of such receptacle; a conduit from the lower part of the crank case discharging into said receptacle; a chamber into which said receptacle discharges its liquid contents; a filtering screen for separating solid matters from the liquid, positioned in said chamber for discharge thereonto of the liquid from the receptacle above; a heating element in said chamber below the filtering screen therein; a liquid discharge conduit leading from the lower part of said chamber back to the crank case; a vapor conduit leading from a higher point in said chamber, and a condenser into which said vapor conduit discharges.

In testimony whereof, I have hereunto set my hand at Chicago, Illinois, this 1st day of February, 1917.

WEBB JAY.