

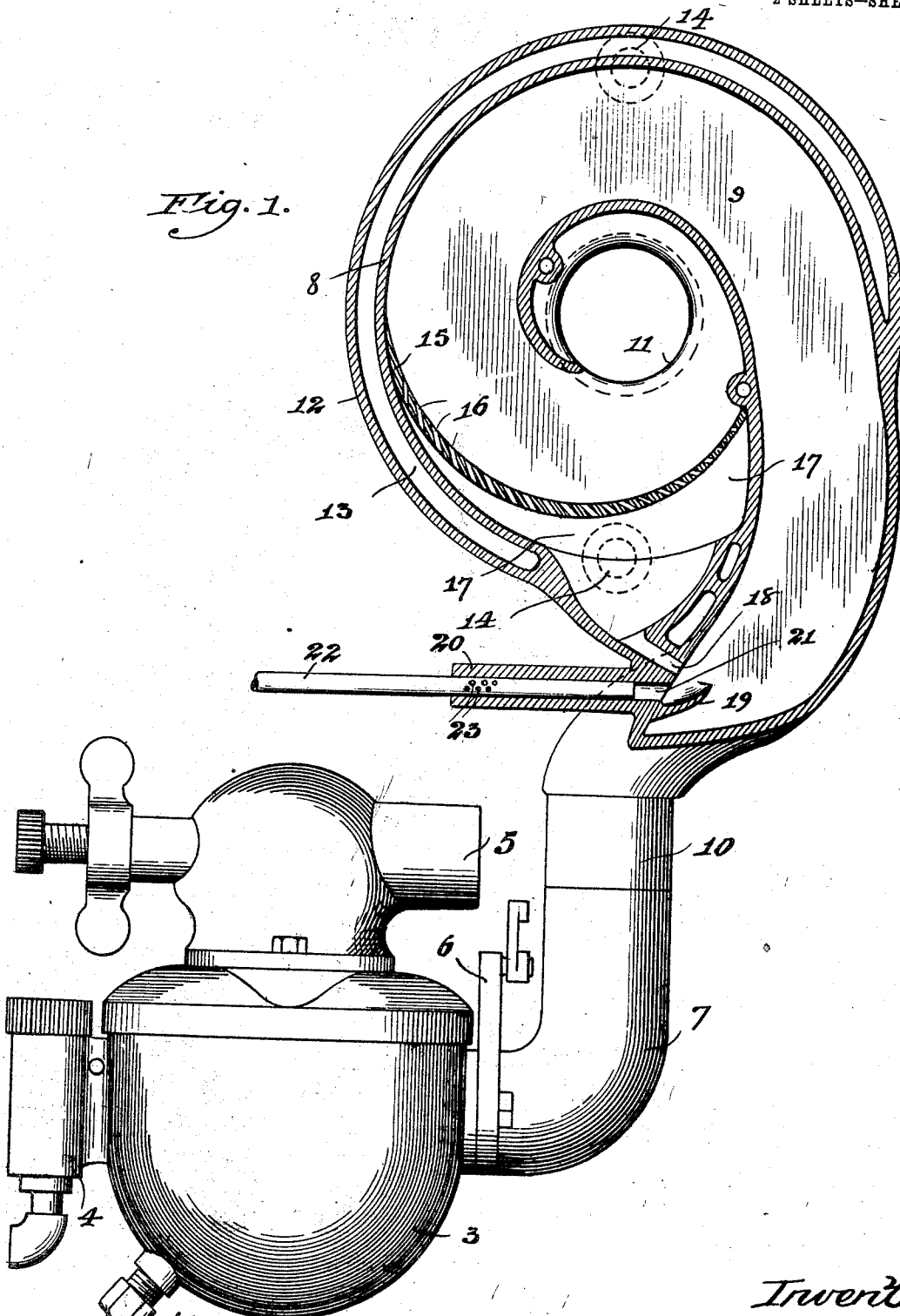
A. T. EDMONSON.
SEPARATOR AND VOLATILIZER.
APPLICATION FILED NOV. 24, 1911.

1,036,812.

Patented Aug. 27, 1912.

2 SHEETS—SHEET 1.

Fig. 1.



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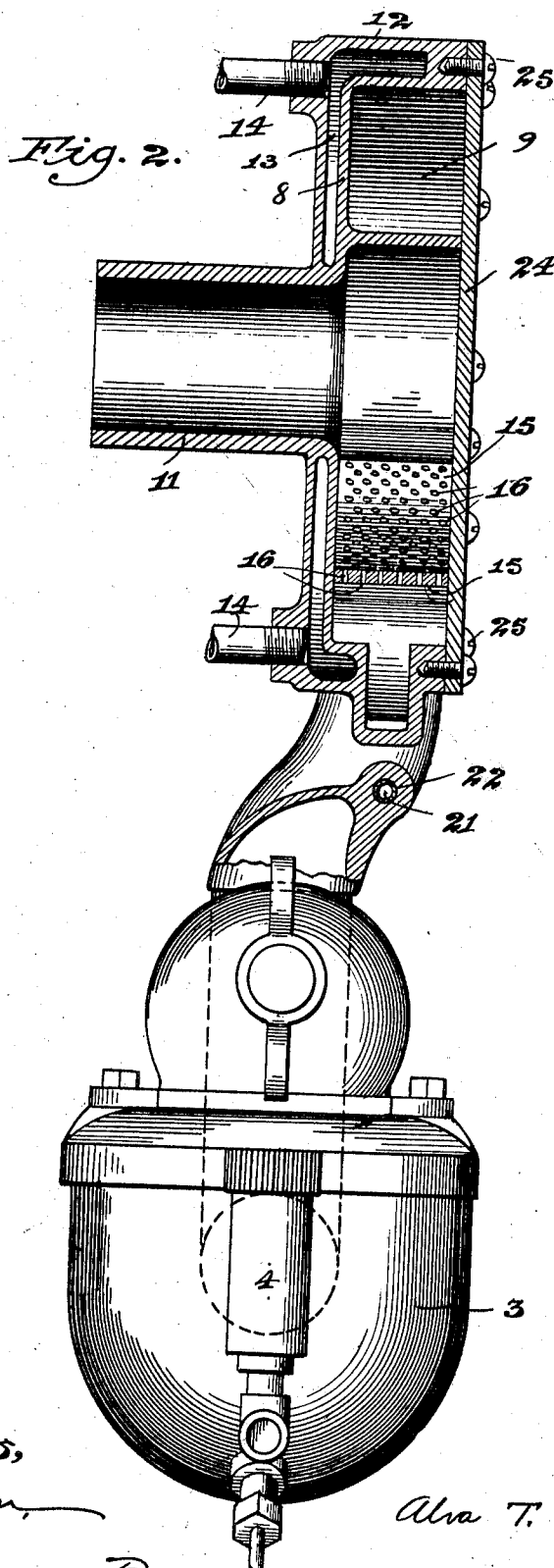
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UNITED STATES PATENT OFFICE.

ALVA T. EDMONSON, OF CHICAGO, ILLINOIS.

SEPARATOR AND VOLATILIZER.

1,036,812.

Specification of Letters Patent.

Patented Aug. 27, 1912.

Application filed November 24, 1911. Serial No. 662,083.

To all whom it may concern:

Be it known that I, ALVA T. EDMONSON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Separators and Volatilizers, of which the following is a specification.

My invention relates to a combined separator and volatilizer adapted to be used in conjunction with an explosive engine, preferably of the liquid hydro-carbon type.

The device is particularly designed to be connected to the manifold pipe of an engine at any suitable point between the carbureter and the engine itself.

The principal object of any carbureter is to break up and volatilize the liquid hydro-carbon or other gaseous fluid so that it enters the cylinder of an engine in a volatilized state. Liquid hydro-carbon, however, is not always successfully broken up or volatilized in passing through a carbureter.

The principal object of my invention, therefore, is to break up and volatilize such portions of the gaseous fluid as pass through the carbureter and are not volatilized. This I accomplish by causing the fluid to flow in such a direction as to set up centrifugal action; the heavier particles not volatilized being thrown against the device and such particles as are not broken up by the centrifugal action will be diverted from the course of the lighter or volatilized fluid and returned to the manifold where they will again be subjected to centrifugal action.

Further objects of my invention reside in means for heating the conduit through which the fluid passes, whereby volatilization will take place more readily, and in means for introducing air into the manifold.

Still a further object of the device is to trap any foreign material in the liquid hydro-carbon, so that it will not enter the cylinder.

In the accompanying drawings, Figure 1 is a vertical section of my device attached to a carbureter. Fig. 2 is a section taken at right angles to Fig. 1.

Referring now more particularly to the drawing, the carbureter 3 is of the ordinary type having a gasoline or fluid intake pipe 4, air intake pipe 5 and a throttle 6 for controlling the amount of fluid entering the manifold pipe 7.

The carbureter herein shown *per se* constitutes no part of my invention. My device consists, in the preferred form, of a casting 8 having a conduit 9 formed therein, communicating with the manifold 7 at its intake end 10 and its discharge end 11 adapted to communicate with the cylinder of an engine. The conduit may be of any desired form whereby centrifugal action is set up upon the fluid passing therethrough, but in the particular structure herein shown it is in the form of an involute curve. A jacket 12 is formed on the exterior of the device, preferably integral therewith, leaving a chamber 13 for the circulation of water or any other suitable medium for heating the conduit; the heating medium being admitted or discharged through either of the pipes 14 communicating with the chamber 13. At a suitable point within the conduit and forming a part of the conduit itself, I place a baffle plate 15, which is preferably curved, and is provided with a series of openings or perforations 16; said openings or perforations preferably arranged at an angle to the flow of the liquid through the conduit. A trap 17 is thus formed between the outer wall of the conduit and the plate 15, thereby inclosing the openings 16 for the purpose of catching the heavier particles in the fluid that are thrown against the plate 15 by centrifugal force and which pass through the perforations 16. A communicating passageway 18 is formed through the wall of the conduit leading into the trap 17, and beneath said communicating passageway, where it opens into the conduit, I form a lip 19 projecting between the side walls of the conduit, thereby forming a cup into which the heavier particles in the fluid will fall from the trap 17. A stud 20 is preferably formed integral with the wall of the conduit which is axially bored forming an air intake opening 21 controlled by a valve 22 having perforations 23 therein for admitting air into the conduit when desired.

In the preferred form of construction the side wall 24 of the device is formed separate from the remaining integral portion and secured thereto by screws 25, or any other suitable means. I so construct the device for the convenience of manufacture with the plate 15 as a separate element, although it is obvious that the plate 15 might be formed integral if desired. I also wish it

to be understood that the conduit is shown in the form of an involute curve merely for the reason that my device as designed is adapted for attachment to a particular type of engine, it being necessary to make the device as small in cross-section as possible, but the conduit might be formed either helical, spiral or in any shape whereby centrifugal action is set up upon the fluid passing there-
10 through.

The operation of the device is as follows: The explosive gaseous mixture enters the manifold from the carbureter in a more or less volatilized state, passing into my de-
15 vice at its intake end 10 and is drawn through the conduit by the suction in the manifold produced by the cylinder of the engine. In passing through the curved conduit centrifugal action is set up so that the heavier particles of the liquid hydro-
20 carbon, as well as any foreign material, will be thrown against the perforated portion of the conduit herein shown as plate 15, and if such particles of the liquid hydro-carbon are not broken in striking the plate or per-
25 forated wall of the conduit, they will pass through the openings 16 into the trap 17 while the volatilized gases will pass out through the discharge end 11 into the en-
30 gine cylinder. Such material as enters the trap 17 will fall through the communicating passage 18 into the cup formed by the lip 19. It will be noted that the lip 19 partially obstructs the passage of the fluid
35 through the conduit so that a partial vacuum will be formed within the cup, but the suction in the conduit will be sufficient to draw the fluid from within the cup back into the conduit, and if not volatilized in
40 passing through the conduit the second time, such particles will again be caught and the action repeated until volatilization takes place. To aid in volatilizing the
45 fluid, the chamber 13 is formed in which a heated fluid may be circulated, thereby heating the wall of the conduit and assisting in the volatilization of the fluid passing through the conduit.

While it is not necessary it is advisable, however, to afford some means for intro-
50 ducing a sufficient amount of air into the manifold to compensate for the additional fluid entering the manifold through the pas-
55 sage 18, and to this end I provide the valve 22 for admitting air into the conduit which

may be automatically or manually controlled as desired.

Having now described my invention, and without limiting myself to the particular details of construction shown,—

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I claim:

1. A separator and volatilizer consisting of a conduit having an unobstructed and continuously curved inner wall formed to set up a centrifugal action on a fluid pass-
65 ing therethrough, said conduit having an opening in the wall thereof where centrifugal action occurs, a trap adjacent said opening and a passageway communicating with said trap for returning the fluid caught
70 therein to said separator.

2. A separator and volatilizer consisting of a conduit having a continuously curved inner wall formed to set up centrifugal action on the fluid passing therethrough, said
75 conduit having openings where centrifugal action occurs, a trap adjacent said openings and a communicating passageway between said trap and conduit.

3. A separator and volatilizer consisting of a conduit having a continuously curved inner wall formed to set up centrifugal action on the fluid passing therethrough, said
80 conduit having openings where centrifugal action occurs, a trap adjacent said open-
85 ings, a communicating passageway between said trap and conduit and an air passageway opening into said conduit.

4. A separator and volatilizer consisting of a continuously curved conduit through
90 which a fluid is adapted to pass, a perforated plate therein arranged at an angle to the flow of the liquid through said conduit, a trap communicating with said conduit and a communicating passageway between said
95 trap and conduit.

5. A separator and volatilizer consisting of a continuously curved conduit through which a fluid is adapted to pass, a perforated plate therein arranged at an angle to
100 the flow of the liquid through said conduit, a trap in said conduit, a communicating passageway between said trap and conduit and a water-jacket partially inclosing said conduit.

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Witnesses:

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