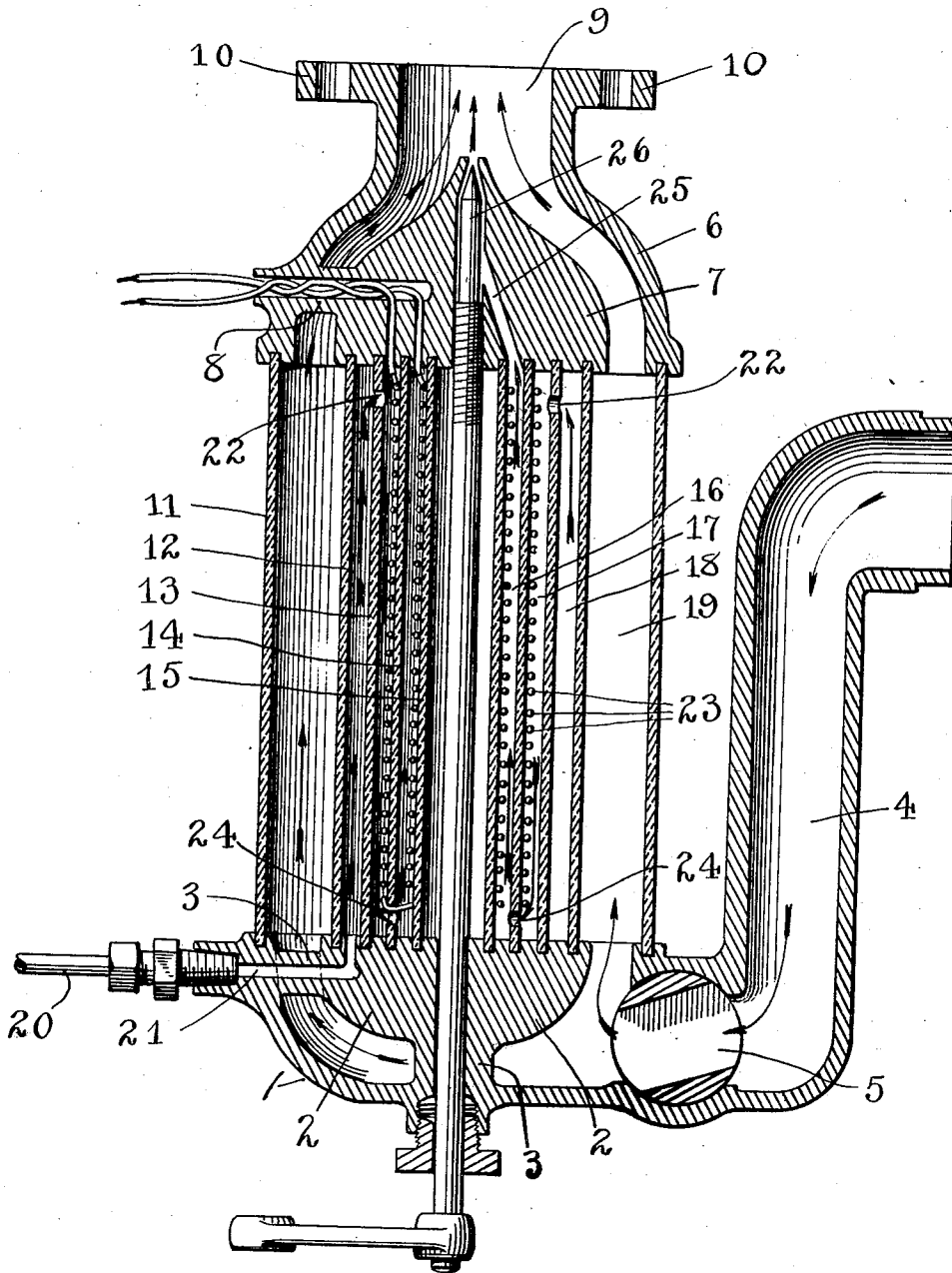


T. BEUCUS.
VAPORIZER.
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WITNESSES

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VAPORIZER.

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To all whom it may concern:

Be it known that I, THOMAS BEUCUS, a citizen of the United States of America, residing at Cedar Springs, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Vaporizers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in vaporizers, and its object is to provide a device of this type which will successfully vaporize the less volatile hydro-carbon fuels such as kerosene, crude oil, etc., and to mix the same with the proper quantity of air to form a combustible gas, to provide a device which is compact and simple in construction and to provide the same with various other new and useful features of construction and arrangement as hereinafter more fully described and particularly pointed out in the claims, reference being had to the accompanying drawing which represents a vertical section of a vaporizer embodying my invention, said section being taken through the axis of the device.

1 represents a metallic base member cup-like in form and provided with a central supporting member 2 preferably cast integral with the said base member, but spaced away from the walls thereof and supported by bosses 3. An air induction passage 4 is provided on the said base member and communicates therewith, and a valve 5 is provided in this passage and adapted to be manually adjusted to control the quantity of air admitted into the base member.

A metallic head member 6, substantially the form of an inverted cup is located above the base member and spaced apart therefrom, and said head member is provided with a supporting member 7 similar to the one located in the base member and likewise spaced away from the sides of the head member and supported by bosses 8, several of which may be located at intervals around the sides of the said member. An outlet passage 9 is provided in the upper side of the head member and flanges 10 provided with bolt holes adapt this head member to be attached to an eduction pipe.

The body of this device is preferably formed of a plurality of tubes 11, 12, 13, 14 and 15, these tubes being preferably made

of glass and are concentrically arranged and spaced apart, forming a series of concentric annular chambers. The tubular members are interposed between the base and head members 1 and 6 and their respective ends are let into concentric annular grooves turned in the respective upper and lower faces of said base and head members, the outer tube 11 being supported by the rims of the base and head members while the rest of the tubes are supported by the supporting members 2 and 7.

The annular passage 19 which is formed between the outer tube 11 and the next inner tube 12, serves as an air passage and communicates directly with the cuplike interior of both base and head members, and air passing in through the induction passage 4 will freely pass through the base member and through the said annular passage 19, into the head member and through the eduction passage 9.

The fuel to be vaporized is taken in through a pipe 20 which communicates with a passage 21 extending through one of the bosses 3 in the base member, and which leads into the lower end of the chamber 18 formed between the tubes 12 and 13. The tube 13 which forms the inner wall of this chamber, is provided at its upper end with a series of openings 22 which allow the fuel to pass into the next inner chamber 17 of the series, this chamber being formed between the tubes 13 and 14 and the tube 14 which forms the inner wall of this chamber has a coil of wire 23 wound about it, this winding preferably being commenced at the upper end of the tube and continued spirally throughout its entire length, and the wire at the lower end of the tube passing through an opening 24 therein and thence wound about the inner tube 15 of the series spirally toward the top thereof. Both ends of the wire are passed out through the head of the device and connected in an electrical circuit. The wire 23 which is used to form the coils about these tubes is preferably of German silver or some material having high electrical resistance, and as the current is passed through the coils they become heated and as the fuel flows into the chamber 17, it comes in contact with this heated coil of wire which tends to vaporize it. The fuel passes from the chamber 17 to the next inner chamber 16, through a series of openings 24 provided in the lower end of the tube 13, it

then follows the inner coil in the chamber 16 upward and by the time it has reached the upper end of this chamber the heat from the coils has transformed it into a gaseous state and it passes out of this chamber 16 through a passage 25 in the head of the device to the needle valve 26 which communicates with the outlet passage 9. After passing through the needle valve, this gas mixes with the air which flows through the passage 19, forming a combustible mixture, and then out of the eduction passage 9 to any source of utilization.

When the device is used in connection with an internal combustion engine the inlet passage 4 of the device is preferably connected by tubing, to a chamber surrounding the exhaust manifold of the engine or to any source from which heated air may be obtained, and this heated air as it is drawn in through the passage 19 which surrounds the inner tubular chambers which contain the fuel, aids in heating the fuel contained therein and also tends to maintain the vaporized fuel in its gaseous state after it has been mixed with the air.

The valve 5 in the air passage may be adjusted to admit the proper amount of air and the needle valve-26, the stem of which extends downward through the central tube 15 and projects through the lower side of the base member, is adapted to be manually adjusted to control the passage of vaporized fuel therethrough, and I have found that the manipulation of this one valve is all that is necessary to control the mixture.

When used in connection with an internal combustion engine using electrical ignition I have found it expedient to utilize a part of the electrical current furnished by the ignition apparatus to heat the coils of wire in this device. This feature however, is optional, as any source of electric current will answer the purpose equally well.

What I claim is:—

1. In a fuel vaporizer, a body having a series of concentric annular chambers one of which serves as an air passage and communicates with an eduction pipe and the remainder of the said concentric annular chambers being inter-communicable and serving as fuel chambers, and also being in communication with the said air passage, an electrical heating unit in one or more of said fuel chambers, and means for supplying the fuel chambers with hydro-carbon fluid.

2. In a fuel vaporizer, a body having a series of concentric annular chambers the outer one of which serves as an air passage and communicates with an eduction pipe, and the inner annular chambers serving as fuel chambers and being inter-communicable and also in communication with the said air passage, an electrical heating unit in one or more of said fuel chambers and means

for supplying the fuel chambers with hydro-carbon fluid.

3. A fuel vaporizer comprising, a body having a series of concentric annular chambers, the outer chamber serving as an air passage and communicating with an eduction pipe, the other chambers serving as fuel chambers, the outer one of which is adapted to receive a supply of hydro-carbon fluid and the walls of the inner chambers being provided with openings through which the fluid may pass, and the innermost annular chamber being in communication with the said air passage, a coil of wire serving as an electrical heating unit located in one of the inner annular chambers, and means for supplying a hydro-carbon fluid.

4. A fuel vaporizer comprising, a body having a series of concentric annular chambers, the outer one of which serves as an air passage and is adapted to communicate with an eduction pipe the remainder of said chambers serving as fuel chambers, the outer one of which is adapted to receive at its lower end a supply of hydro-carbon fluid, the walls of the inner chambers being provided alternately at their respective upper and lower ends with passages through which the fluid may pass, and the innermost annular chamber having an outlet into the said air passage, a valve in said outlet and a coil of wire serving as an electric heating unit in one of the inner annular chambers, and means for supplying hydro-carbon fluid.

5. A fuel vaporizer comprising, a body having a series of concentric annular chambers therein, the outer one of which serves as an air passage and communicates with an eduction pipe and the remainder of the chambers serving as fuel chambers, the outer one of which is adapted to be supplied at its lower end with hydro-carbon fluid, and the walls of the next inner chambers being provided alternately at their respective upper and lower ends with openings through which the fluid may pass, and the innermost annular chamber having an outlet into the said air passage, a valve in said outlet, a coil of wire in one of the inner annular chambers to serve as an electric heating unit, a valve in the air passage, and means for supplying hydro-carbon fluid.

6. A fuel vaporizer comprising, a cup shaped base member having an air inlet passage therein, a valve in said passage, an inverted cup shaped head member spaced apart from the base member and having an outlet therefrom; said head member adapted to be attached to an eduction pipe, a series of tubular body members interposed between the base and head members, concentrically arranged and spaced apart to form a series of concentric annular chambers; the outer one of which communicates at its respective lower and upper ends with the air passage

in the base and head members, and the remainder of the chambers serving as fuel chambers; the outer one of which is adapted to be supplied at its lower end with hydro-
5 carbon fluid; and the tubular members forming the walls of the inner annular chambers being provided alternately near their respective upper and lower ends with openings
10 through which the fluid may pass, and the innermost annular chamber having an outlet through the head member which communi-

cates with the air passage therein, a valve in said outlet and coils of wire in the inner annular chambers serving as electrical heating units, and means for supplying hydro- 15 carbon fluid.

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

THOMAS BEUCUS.

Witnesses:

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