W. D. JOHNS.

VAPORIZER.

APPLICATION FILED APR. 11, 1917.

1,293,456. Patented Feb. 4, 1919.

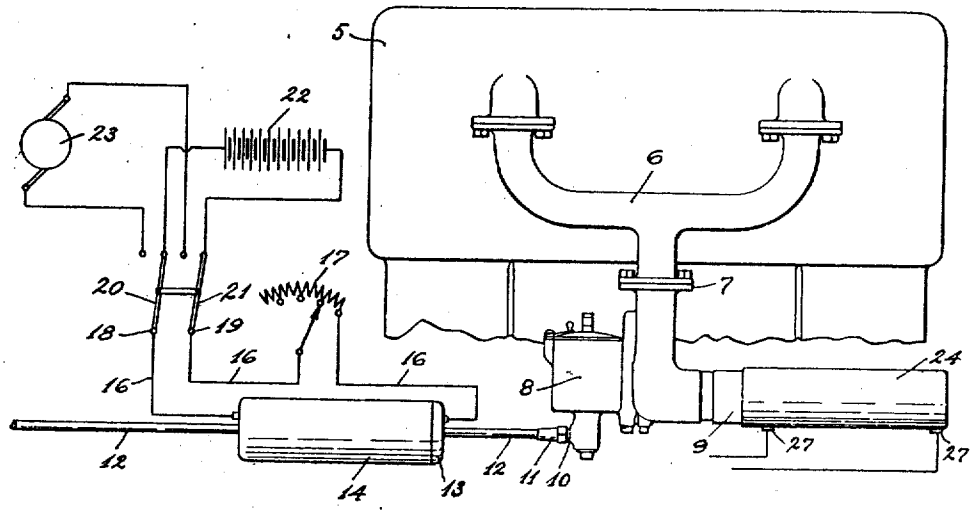


FIG. 1

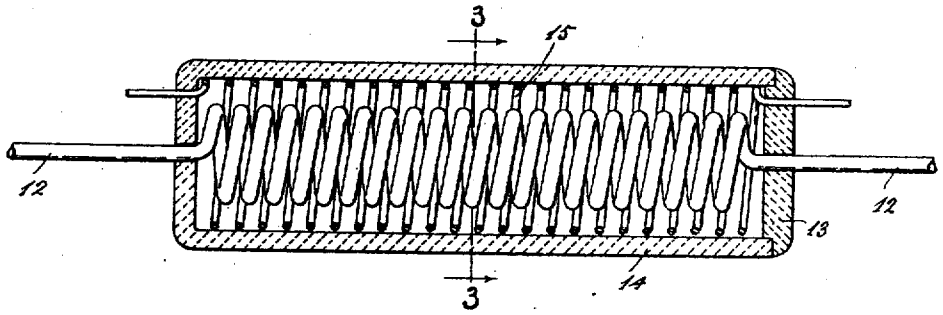


FIG. 2

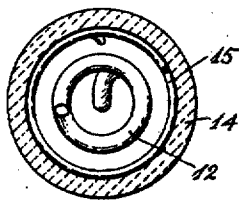


FIG. 3

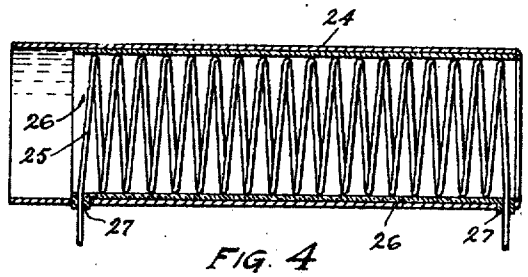


FIG. 4

Inventor
William D. Johns

By C. B. Haskins Attorney

UNITED STATES PATENT OFFICE.

WILLIAM DOUGLAS JOHNS, OF SEATTLE, WASHINGTON.

VAPORIZER.

1,293,456. Specification of Letters Patent. Patented Feb. 4, 1919.

Application filed April 11, 1917. Serial No. 161,151.

To all whom it may concern:

Be it known that I, WILLIAM DOUGLAS JOHNS, citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented a certain new and useful Improvement in Vaporizers, of which the following is a specification.

My invention relates to improvements in combined vaporizer and carbureter for internal combustion engines, and the object of my invention is to provide a combination of vaporizing and carburizing devices that may be operatively disposed in such association with the feed pipe and manifold of an internal combustion engine that the initial charges, as well as the subsequent charges, of both the air and the combustive fluid, or said charges of air only or said charges of combustive fluid only, as may be desired under different conditions of operation, shall be heated to a desired temperature before said charges reach the interior of the carbureter to form the explosive mixture that is to be drawn by suction from said carbureter into the cylinder or cylinders of said engine through its manifold, whereby the initial charge of said explosive mixture shall be heated to such degree as will facilitate its immediate explosion to start the engine in response to the initial electric spark formed within its cylinder, thus obviating the necessity of a repeated cranking of the engine or the necessity of injecting a high grade of gasolene into its carbureter as a primer.

Another object of my invention is to provide apparatus in association with an internal combustion engine whereby said engine shall be adapted efficiently to operate when its explosive mixture is derived from a low grade of combustive fluids, as distillate, kerosene, wood alcohol and the like, instead of gasolene.

I accomplish this object by devices illustrated in the accompanying drawings, wherein—

Figure 1 is a fragmentary view in side elevation of an internal combustion engine and apparatus embodying my invention;

Fig. 2 is an enlarged view in longitudinal mid-section of parts of the same;

Fig. 3 is a view in cross-section on broken line 3, 3 of Fig. 2 of the parts shown in said Fig. 2; and

Fig. 4 is an enlarged view in longitudinal mid-section of other different parts of my invention.

Referring to the drawings, throughout which like reference numerals indicate like parts, 5 designates an internal combustion engine which is provided with a manifold 6 that is connected in a well known manner with the inlet passageways of the cylinders of said engine.

Connected to the lower end portion of the manifold 6, by means of a flanged coupling 7, is the outlet end portion of a carbureter 8 which may be any one of the different well known forms of carbureters.

A nipple 9 is connected to one side of the lower end portion of the carbureter 8, through which nipple 9 air may be conducted into the interior of said carbureter 8 there to mix with vapor of the combustion fluid which may be conducted into said carbureter 8 through a nipple 10 which is screwed into an inlet passageway provided in the vertical wall at the other side of the lower end portion of said carbureter 8.

Connected to the nipple 10, by means of a union 11, is a valve-controlled feed pipe 12 which extends through the central portion of a removable end wall 13 of a hollow, cylindrically formed inclosing case 14, thence in a spiral course throughout the length of the space within said inclosing case 14, thence in a straight course out of said inclosing case 14 through the central portion of its other end wall (as shown more clearly in Fig. 2) from which point it may be extended to connect with a source of supply of combustive fluid, not shown, through which feed pipe 12 said combustive fluid may be conducted to the nipple 10 to flow therethrough into the carbureter 8 in an obvious manner.

The inclosing case 14 is preferably made of refractory earthy material that is a non-conductor of electricity and heat, as porcelain, and within its interior the spirally formed portion of the feed pipe 12 is surrounded by an annularly spaced electric heating element 15, of helical form, whereby said heating element may radiate its heat to heat said spirally formed portion of said feed pipe 12 thereby to heat the combustive fluid flowing therethrough before it enters the carbureter 8.

The heating element 15, as shown more clearly in Fig. 1, is connected in an electric circuit 16 which includes an adjustable current regulating rheostat 17 and two terminals 18 and 19 of levers 20 and 21 of a double pole electric switch.

The levers 20 and 21 of the double pole switch are adapted to be moved simultaneously to connect them in a well known manner either with an electric battery 22 or a dynamo electric machine 23, as may be desired at different times, thus to supply current for the heating element 15.

While I have shown the heating element 15 as of being of helical form, different ones of other well known forms may be substituted therefor.

Connected to the nipple 9 by a slip joint is one end of a short length of a metal pipe 24 whose other end is opened and through which air may pass on its way into the carbureter 8.

Disposed within the pipe 24 is a heating element 25, of helical form, which is electrically insulated from the interior surface of said pipe 24 by refractory non-heat-conducting material 26, as asbestos or mica, and whose terminals extend through insulating bushings 27 that project through the wall of said pipe as shown more clearly in Fig. 4.

The heating element 25 may be included in the circuit 16, in a well known manner, whereby it may be heated at the same time that the heating element 15 is heated; or said heating element 25 may be included in a separate switch-controlled circuit that is connected to the battery 22 and the dynamo electric machine 23 in a well known manner not shown, whereby said heating element 25 may be independently heated at required different times.

The operation of my combined vaporizer and carbureter when associated with an internal combustion engine, in the manner hereinbefore described, is as follows:

The levers 20 and 21 of the double pole switch are disposed to connect with the battery 22 to heat the heating element 15 to a temperature that may be regulated by the rheostat 17 whereby said heating element 15 will act to heat the spiral portion of the feed pipe 12, whereupon combustive fluid, as gasolene or kerosene may be permitted to flow through said feed pipe 12 to be heated as it passes through the spiral portion of it within the inclosing case 14, which heat will cause said combustive fluid to enter the carbureter 8 in the form of hot vapor, where it will mix with air that finds admittance through the pipe 24 to form a warm explosive mixture that will be drawn into the cylinders of the engine 5, in response to the cranking of said engine 5, there to be ignited by the first electric spark formed by the operation of the igniter disposed in said cylinders, and such ignition of the explosive mixture is facilitated by reason of its temperature being much above normal and thus the engine immediately starts without repeatedly cranking it.

After the engine is running normally the levers 20 and 21 may be thrown to connect with the dynamo electric machine 23 which may thereafter furnish the current to maintain the heating element 15 in a heated condition.

If the heating element 25 in the pipe 24 be included in the circuit 16, then the air passing into the carbureter 8 will also be heated thus to increase the temperature of the explosive mixture formed therein.

If combustive fluid of a low grade be heated before it reaches the interior of the carbureter it will vaporize as readily as a higher grade at normal temperature and hence a low grade of combustive fluid, when used in connection with my combined vaporizer and carbureter, will serve as efficiently as a high grade of gasolene.

Preferably the inclosing case 24 is disposed as close to the carbureter 8 as possible and it should be covered with a lagging of non-heat-conducting material thus to insure that the combustive fluid be delivered to the carbureter at a high temperature.

Obviously changes may be made in the forms, dimensions and arrangement of parts of my invention without departing from the spirit thereof.

What I claim is:

A vaporizer comprising a body of ceramic material having an internal hermetically sealed chamber, a helically coiled carbureter fuel feed pipe traversing the length of the body and passing through the ends thereof, said pipe having its coils housed within the chamber and spaced from the sides thereof, and a helically coiled electric resistance element also traversing the length of the body and passing through the ends thereof, the coils of said element surrounding the coils of the pipe and lying against the inner surface of the sides of the body.

In witness whereof, I hereunto subscribed my name this 3rd day of April, A. D. 1917.

WILLIAM DOUGLAS JOHNS.