C. W. DYER.

OIL VAPORIZER FOR EXPLOSIVE ENGINES.

APPLICATION FILED JULY 27, 1916.

1,226,319. Patented May 15, 1917.

Fig. 1

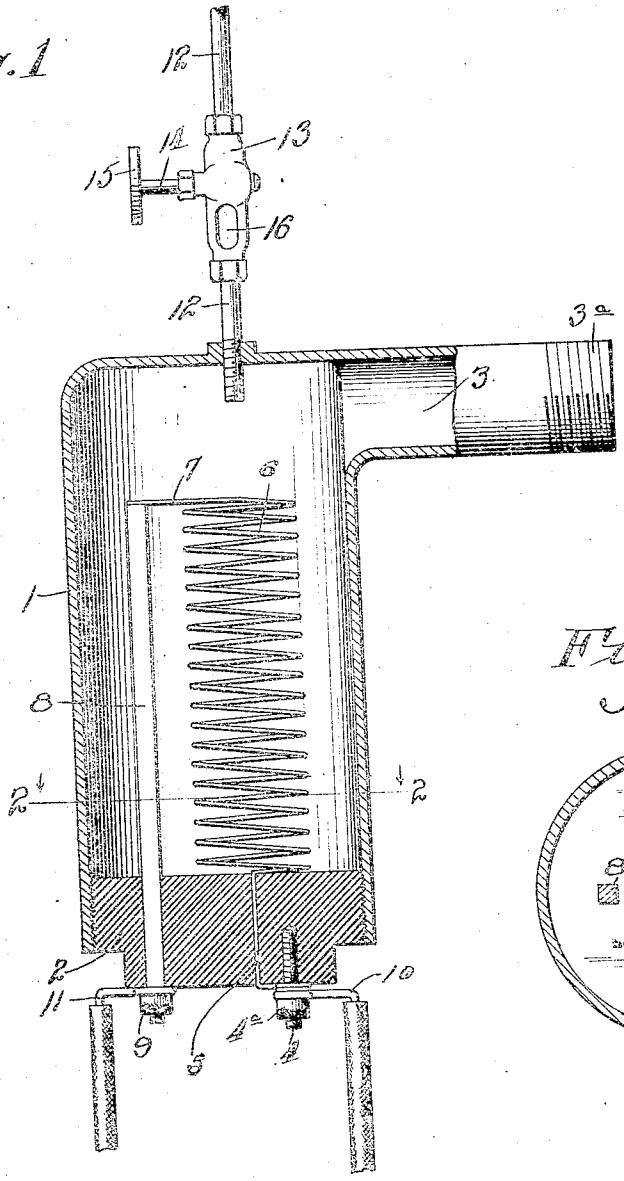
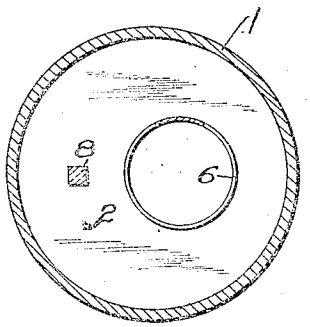


Fig. 2.



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OIL-VAPORIZER FOR EXPLOSIVE-ENGINES.

1,226,319. Specification of Letters Patent. Patented May 15, 1917.

Application filed July 27, 1916. Serial No. 111,711.

To all whom it may concern:

Be it known that I, CHARLIE W. DYER, a citizen of the United States, residing at Stratton, in the county of Franklin and State of Maine, have invented certain new and useful Improvements in Oil-Vaporizers for Explosive-Engines, of which the following is a specification.

This invention relates to engine starters, and more particularly to a vaporizing device for supplying an explosive mixture to the cylinder of a cold engine so as to enable the same to be started.

Great difficulty is frequently experienced in starting gas-engines after they have cooled, due to the fact that the explosive mixture which is sprayed into the cold cylinder quickly condenses so as to render it very difficult to ignite the same. One of the main objects of my invention is to eliminate this difficulty by providing means for supplying an explosive mixture to the cylinder in vaporous form. A further object is to provide means of simple construction and operation for producing this vaporous mixture. Further objects will appear from the detail description.

In the drawings:—

Figure 1 is a central vertical sectional view through the vaporizing means.

Fig. 2, is a section on line 2—2 of Fig. 1.

The numeral 1 designates a cylindrical chamber or casing in the lower end of which is threaded a cylindrical plug 2 of hard rubber or other suitable electrical insulating material. The casing 1 is provided, at the upper end, with an integral laterally extending nipple 3 the outer end of which is externally threaded, as at 3^a, so as to be attached to the intake pipe of a gas engine.

The plug 2 is provided with a terminal post 4 secured therein and threaded to receive a securing nut 4^a. This post is connected by a lead 5 to the lower end of a coil 6 mounted in the casing 1 a short distance to one side of the center thereof. This coil is made of German-silver wire of suitable gage, or other suitable material. The coil 6 is elongated so as to extend to within a short distance of the upper end of the casing. The upper end of the coil is electrically connected by a lead 7 to the upper end of a rod 8 of copper, or suitable material, secured through the plug 2 and having its lower end threaded to receive a binding nut 9. The rod 8 and the post 4 are connected to the wires 10 and 11, respectively, which are connected to the opposite side of an electric battery, not shown. A suitable switch may be interposed in one of the wires. By closing the switch a current of electricity will be caused to flow from the battery through the coil 6 so as to heat the same to a high temperature.

A fuel supply pipe 12 is threaded through the upper end of cylinder 1 with its lower end in vertical alinement with the coil 6. An elongated valve casing 13 is interposed in this pipe and contains a feed control valve the stem 14 of which projects beyond the casing and is provided on its outer end with a hand wheel 15. The pipe 12 communicates with a fuel supply tank, not shown, carried by the automobile. The flow of the fuel through pipe 12 may be controlled by the valve, and the rate of flow may be observed by means of the window 16 provided in the valve casing 13, near the lower end thereof, for this purpose.

In starting an engine which has become cold, the valve in pipe 12 is open sufficiently to permit the fuel to drip slowly onto the coil 6. The battery circuit is then closed so as to heat the coil which then acts to vaporize the fuel, which is preferably kerosene or any other relatively heavy hydrocarbon. The vaporized kerosene is drawn into the engine cylinders, when the engine is cranked. This vapor is readily exploded by ignition from the usual spark plug. As this kerosene vapor is comparatively heavy and is supplied to the cylinders in relatively large quantities there is no danger of failure of the same to be properly exploded. After the engine has been started, by means of the vaporized kerosene, the throttle may then be gradually opened so as to supply gasolene to the cylinders for operating the engine, the supply of kerosene to the vaporizer being cut off as soon as the engine has become heated sufficiently to operate properly on the gasolene mixture. On its suction stroke the engine will withdraw the lighter or upper portion or stratum of the vaporized kerosene from the casing 1, thus making room for the ascending gases resulting from the vaporizing of the succeeding charges of kerosene which are fed or dropped upon the coil 6. By this means only the top stratum of kerosene vapor, which is heated to a relatively high temperature, is drawn into the engine cylinder.

The casing 1 is entirely closed so as to prevent air from being drawn into the same so as to pass through and about the coil and become mixed with the kerosene vapor. This insures two things: First, the explosive charge drawn into the engine cylinder will be rich enough to insure operation of the engine and will be heated to a relatively high temperature so as to eliminate all danger of condensation; second, the vaporizing coil 6 will not be cooled by currents of air passing over and about it, thus insuring a maximum of efficiency.

By having the coil 6 elongated and feeding the fuel directly onto the same, a maximum amount of fuel is vaporized for a given quantity of current consumed. This is due to the fact that the fuel is fed directly onto the heated wire of the coil, and that it travels a relatively long distance through the coil so as to be vaporized by the same before reaching the lower end of the cylinder. The fuel which drops on to the coil 6 flows downward along the same. By this means the fuel is caused to follow a relatively long helical path throughout the whole length of which it is in intimate contact with the entire peripheral surface of the wire from which the coil is formed, thus insuring a maximum amount of vaporization for a given quantity of current consumed. In addition, due to the fact that the coil is a solenoid and opened at its center; not being wound upon a core, a current of heated gases flows upward through the coil which materially assists in the vaporizing of the fuel.

There may be slight changes made in the construction and arrangement of the various parts of my invention without departing from the field and scope of the same, and I intend to include all such variations in this application, as fall within the scope of the appended claim, in which a preferred form only of my invention is disclosed.

What I claim, is:—

The combination of a closed cylinder adapted to be connected at its upper end to the intake of an internal combustion engine, a plug of insulating material secured in the lower end of the cylinder, an elongated solenoid coil carried by the plug, a binding post carried by the plug and electrically connected to one end of the coil, a rod carried by the plug and electrically connected to the other end of the coil, a pipe threaded through the upper end of the cylinder in vertical alinement with the coil, and a feed regulating valve interposed in the pipe.

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

CHARLIE W. DYER.

Witnesses:
M. A. Butts,
Ray L. Lisherness.