J. D. WEIN.

INTERNAL COMBUSTION ENGINE.

APPLICATION FILED FEB. 8, 1919.

1,343,858.

Patented June 15, 1920.

3 SHEETS—SHEET 1.

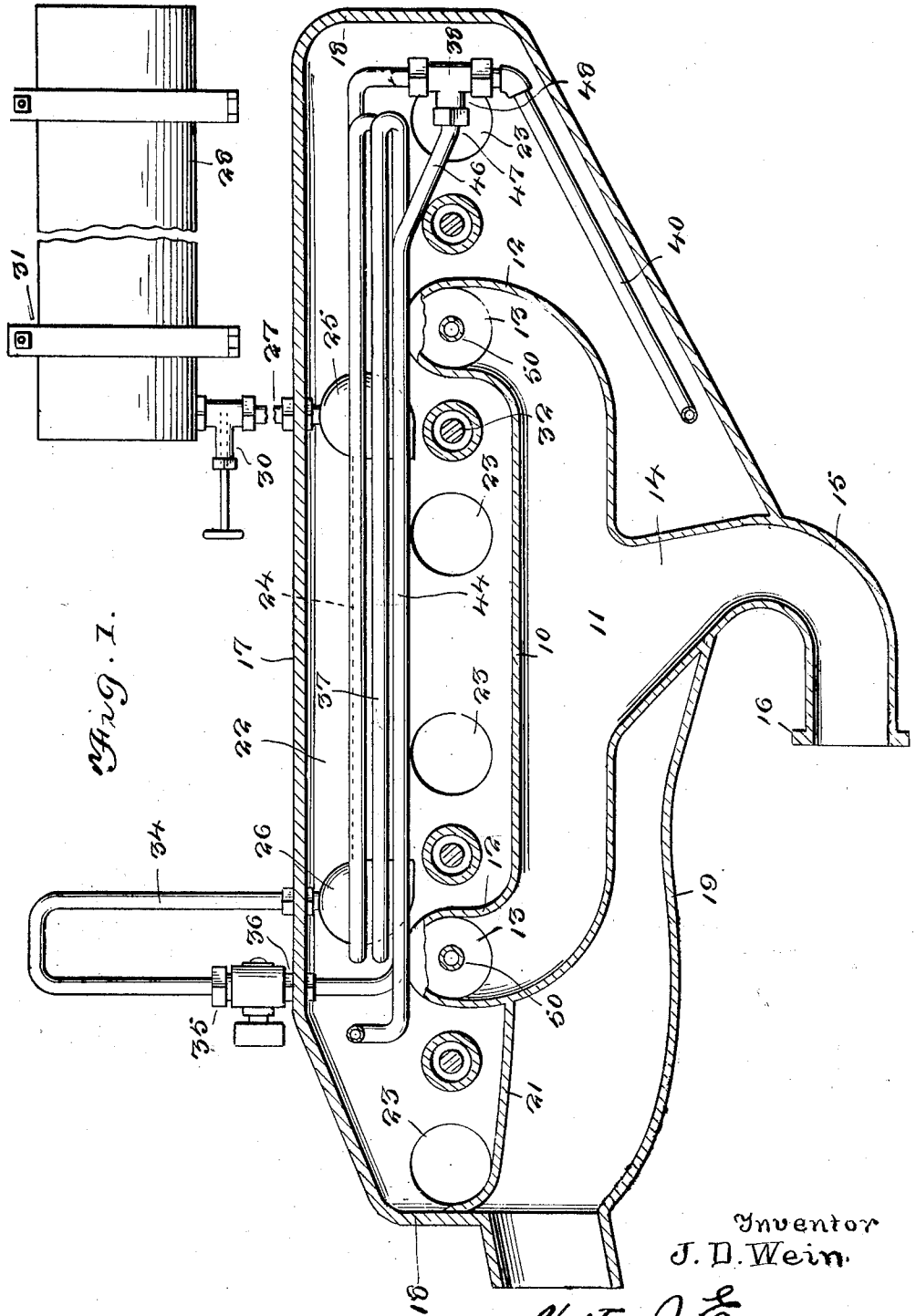


Fig. 1.

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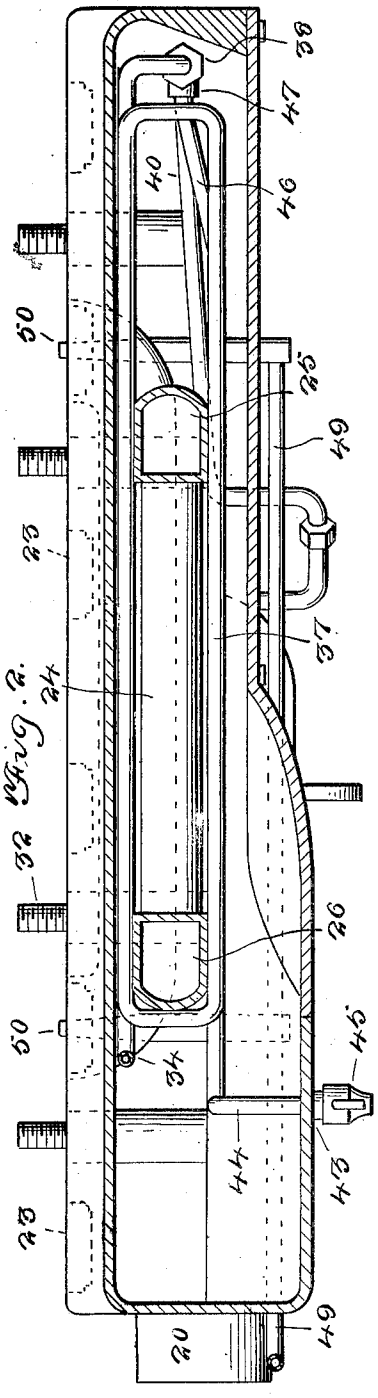
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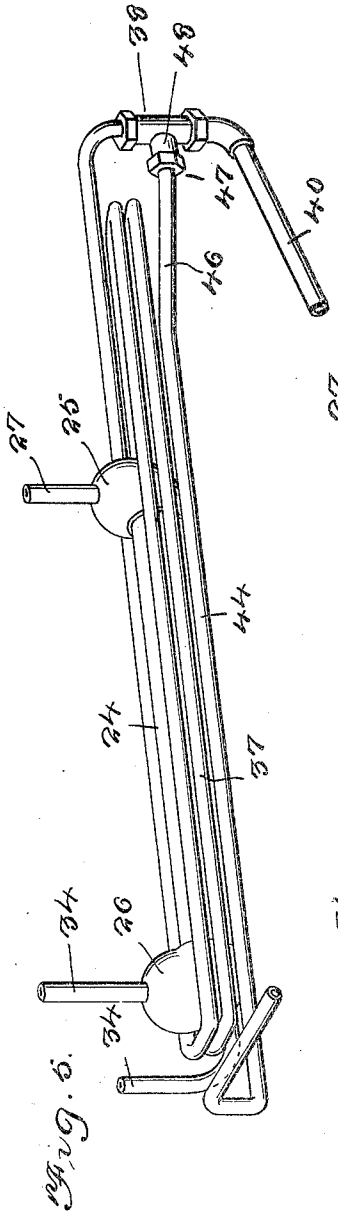
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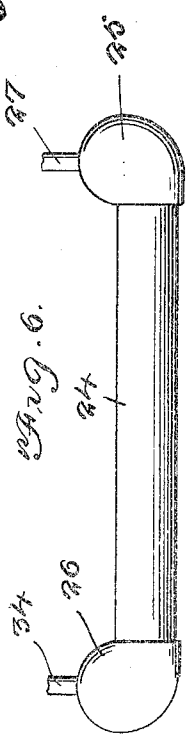
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3 SHEETS—SHEET 2.







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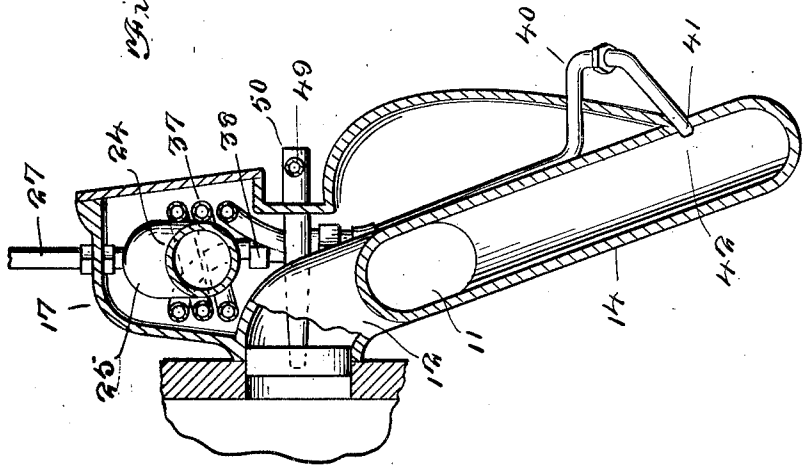
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3 SHEETS—SHEET 3.

Fig. 4.



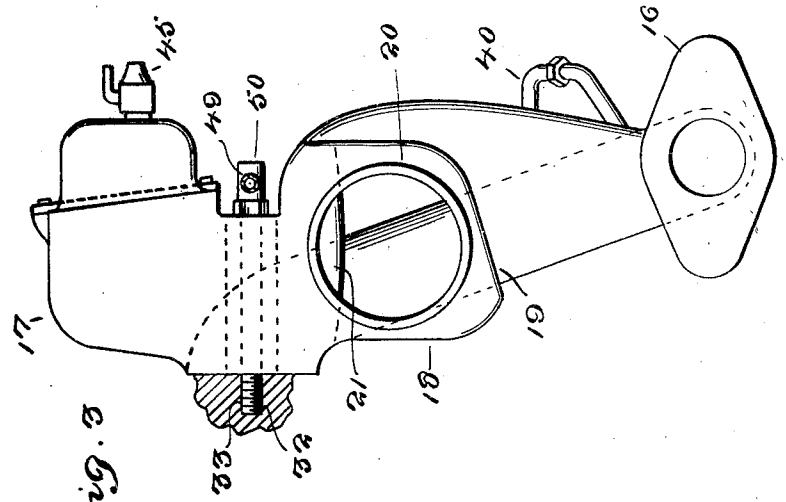


Fig. 5.

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UNITED STATES PATENT OFFICE.

JENS D. WEIN, OF TROY, NEW YORK, ASSIGNOR TO WEIN MANUFACTURING CORPORATION, OF TROY, NEW YORK.

INTERNAL-COMBUSTION ENGINE.

1,343,858. Specification of Letters Patent. Patented June 15, 1920.

Application filed February 8, 1919. Serial No. 275,924.

To all whom it may concern:

Be it known that I, JENS D. WEIN, citizen of the United States, residing at Troy, in the county of Rensselaer and State of New York, have invented new and useful Improvements in Internal-Combustion Engines, of which the following is a specification.

This invention relates to new and useful improvements in internal combustion engines, and more particularly to charge forming devices therefor.

The primary object of the invention is to provide a device by means of which the heavier oils such as kerosene may be employed in internal combustion engines.

A further object of the invention is to provide means by which the oil is heated prior to its introduction into the cylinders of the engine.

A further object of the invention is to provide means for introducing steam and water into the engine cylinders in combination with the fuel oil.

A further object of the invention is to provide means by which the steam and oil is heated before entering the engine cylinders.

Referring to the accompanying drawings:—

Figure 1 is a vertical longitudinal sectional view through the intake and exhaust manifolds showing the device in place.

Fig. 2 is a horizontal longitudinal sectional view.

Fig. 3 is an end view,

Fig. 4 is a transverse sectional view.

Fig. 5 is a detail perspective view of the device.

Fig. 6 is a detail view of the steam generating tank.

Referring more particularly to the drawings, the reference character 10 designates the intake manifold of an internal combustion engine which is so constructed as to form an internal chamber 11 from the opposite ends of which project extensions 12 which in turn communicate with the engine cylinders by means of ports 13. Projecting from the lower portion of the intake manifold 10 is a neck or the like 14 which is curved as at 15, and terminates in an enlarged collar 16 to which a suitable carbureter (not forming a part of this invention) may be attached.

Surrounding the intake manifold 10 is a casing member which comprises a top wall 17, end walls 18, and a bottom wall 19, this casing forming the exhaust manifold of the engine. Leading from one of the end walls 18 is an extension 20 by which the exhaust manifold is connected in any suitable manner with a muffler (not shown). At one end of the casing, and extending from the end of the intake manifold to the end wall of the casing is a partition 21, the purpose of which will be specifically set forth.

This casing provides a chamber 22, which also communicates with the interior of the engine cylinders by means of the exhaust ports 23 of the various cylinders.

Located above the intake manifold 10, and within the confines of the chamber 22 is a water tank 24 which is shown in Fig. 2, comprising a length of pipe upon the ends of which are secured the elbows 25 and 26. Extending through the wall 17 of the chamber 22, and leading from the elbow 25 is a water pipe 27, the opposite end of which is connected to a tank 28, and mounted in said pipe 27 adjacent the tank 28 is a needle valve 30 by means of which the flow of liquid from the tank 28, may be controlled. This tank is adapted to be supported in any suitable place on the engine by means of the brackets 31.

As shown in Fig. 3, the intake manifold and exhaust manifold are secured to the engine cylinders by means of the bolts 32, which engage in screw threaded apertures 33 in said engine cylinders.

Projecting from the elbow 26 and leading through the wall 17 of the chamber 22 is a pipe 34 which is provided with a valve 35, mounted in the pipe 34 adjacent the said wall 17. From this valve, the pipe again leads into the chamber 22 as at 36 where it is formed into a number of coils 37 which surround the tank 24, the free end of this pipe terminating in a T-shaped coupling 38. Leading from the opposite end of the head of the T-shaped coupling is a pipe 40 which passes as at 41, through the neck 14, of the intake manifold 10, and terminates in a spraying nozzle 42, the function of which will be hereinafter more fully set forth.

Leading into the chamber 22, as at 43 is a pipe 44, the outer end of which is provided with a petcock 45 for the purpose of regulating the passage through said pipe. As shown in Fig. 2, this pipe extends

through the chamber 22 in parallelism to the coils 37 of the pipe 34, and has its opposite end bent downwardly as at 46, and connected as at 47 to the stem 48 of the T-shaped member 38.

Projecting through the end wall 18 of the chamber 22 is a pipe 49, which has branches or nozzles 50 which extend laterally therefrom, these nozzles extending into the intake ports 13 and serving as primers in starting the engine.

Having thus described the invention, the operation is as follows:

Light and highly volatile oil such as gasolene is employed to start the engine, this gasolene being introduced into the cylinders through the pipe 49, and the nozzles 50. After the engine has been started, the chamber 22 is completely filled with exhaust gases or products of combustion which are carried off through the outlet 20. The heat of these gases is imparted to the water tank 24 and steam is generated therein. This steam passes out through the pipe 34 and through the coil members 37 where it is superheated. Air is led in through the nozzle 45 and conducted by means of the pipe 44 to the T-shaped coupling 28 where it is mixed with the steam in the pipe 34. From this point both the heated steam and air are conveyed by means of the pipe 40 to the spray nozzle 42 located in the bend 15 of the neck 14. The kerosene or other heavy oil is taken in through the neck 14, and in its passage therethrough, it is mixed with the steam and air as it is ejected through the nozzle.

From the foregoing it will be seen that the present invention provides a device whereby an explosive charge, the base of which is a heavy oil of comparatively low grade, may be effectually formed, and used to advantage.

By providing the plate 21, it will be seen that all of the products of combustion are caused to pass entirely around all of the coils and steam generating tank thus utilizing all of the heat thereof.

Having thus described the invention, what is claimed is:

1. In an engine, an exhaust manifold, an intake manifold arranged within the exhaust manifold and having a neck portion, a steam generating tank arranged above the intake manifold and within the confines of the exhaust manifold, a water tank arranged above the exhaust manifold and communicating with one end of the said generating tank, a pipe leading from the opposite end of said generating tank above the exhaust manifold, said pipe being returned within the exhaust manifold and extended to provide a number of convolutions surrounding the said generating tank, a coupling connected with one end of the final convolutions, an air intake pipe leading in to said exhaust manifold and associated with said coupling, whereby the steam and air is thoroughly mixed in said coupling, a nozzle projecting within the neck of said intake manifold, and a pipe establishing communication between said nozzle and the coupling for the purpose specified.

2. In an engine, an exhaust manifold, an intake manifold arranged within the exhaust manifold, and including a neck, said exhaust manifold having openings to establish communication between the manifold and the cylinders of the engine, a fuel supply pipe arranged parallel with the exhaust manifold, branches leading from said pipe through the openings of said manifold for conveying the fuel to the cylinders, a steam generating tank arranged within the exhaust manifold immediately above the intake manifold, a water supply tank arranged above the exhaust manifold and communicating with one end of said generating tank, a pipe leading from the opposite end of said generating tank, and bent to return to the exhaust manifold, said pipe terminating to provide a plurality of convolutions, a T-coupling connected with the terminal of the final convolutions, an air intake pipe leading into the exhaust manifold and terminally connected with one branch of the coupling, whereby air and steam is thoroughly mixed in said coupling, a nozzle introduced into the neck of the intake manifold, and a pipe establishing communication between said coupling and said nozzle for the purpose specified.

In testimony whereof I have affixed my signature.

Rev. J. D. WEIN.