L. E. JOHNSON.

EXPLOSIVE ENGINE MANIFOLD.

APPLICATION FILED DEC. 2, 1916.

1,392,168. Patented Sept. 27, 1921.

Fig. 1.

Fig. 3.

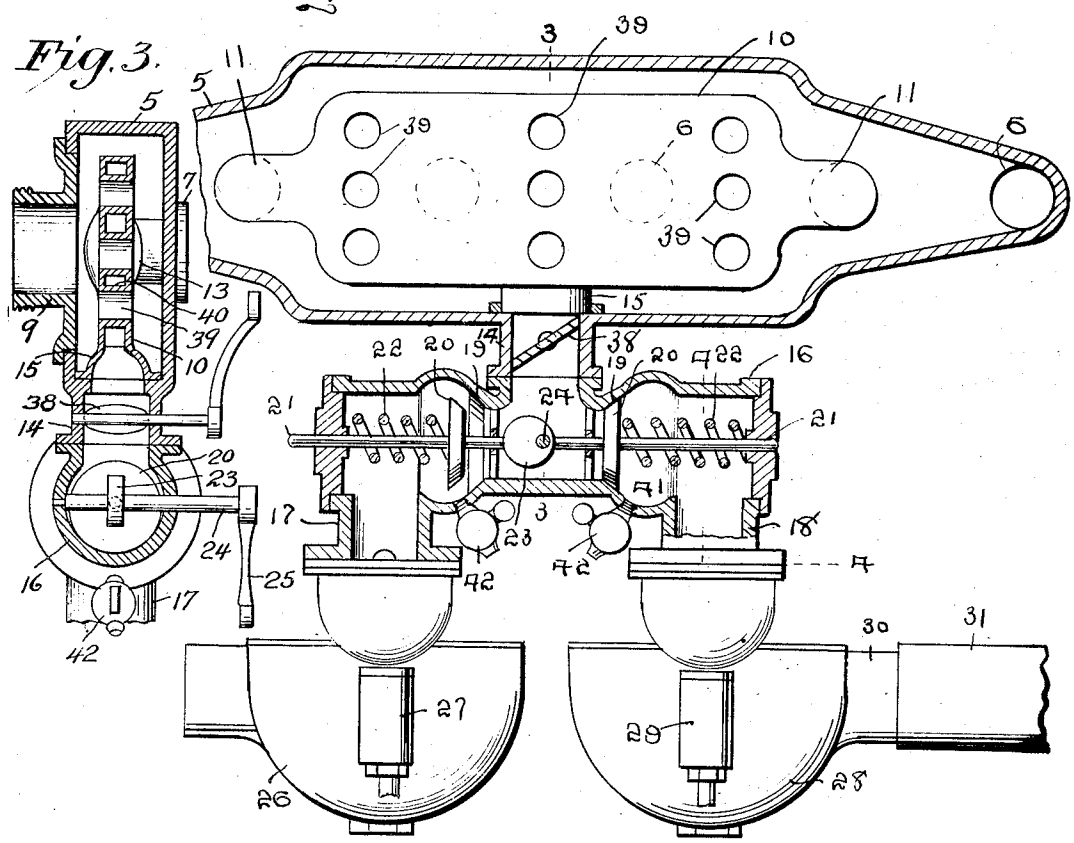
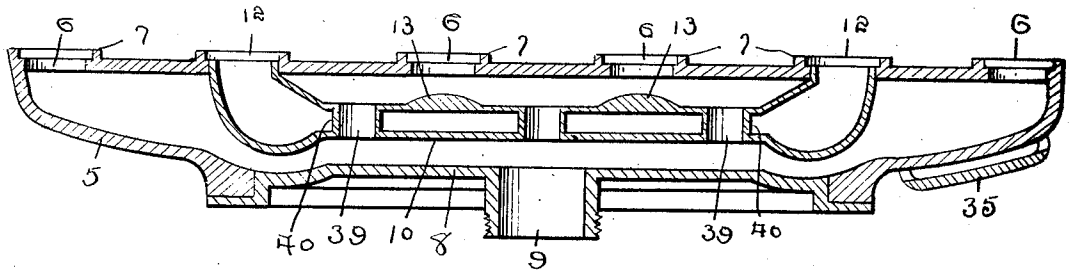


Fig. 2.



Witnesses

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EXPLOSIVE-ENGINE MANIFOLD.

1,392,168. Specification of Letters Patent. Patented Sept. 27, 1921.

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To all whom it may concern:

Be it known that I, LESTER E. JOHNSON, a citizen of the United States, residing at Coffeyville, in the county of Montgomery and State of Kansas, have invented certain new and useful Improvements in Explosive-Engine Manifolds; 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.

This invention has for its object to provide an improved inlet manifold for explosive engines adapted for connection with carbureters utilizing various grades of liquid fuel, and including means for controlling the passage of a mixture from the carbureters to the inlet ports of the engine.

Another object is the provision of means for effectively heating the inlet manifold by the heated products of combustion from the engine, thereby insuring a thorough vaporization of the liquid fuel and consequently increasing the efficiency of the engine.

With these and other objects in view, the invention consists in the novel construction, combination and arrangement of parts as will be hereinafter specifically described, claimed and illustrated in the accompanying drawing, in which:

Figure 1 represents a longitudinal sectional view through the improved manifold,

Fig. 2 represents a longitudinal sectional view taken at right angles to Fig. 1,

Fig. 3 represents a vertical sectional view on the line 3—3 of Fig. 1.

Referring to the drawings in detail, wherein similar reference numerals designate corresponding parts throughout the several views, the numeral 5 indicates generally the exhaust manifold of an explosive engine (not shown), which is formed in the rear wall with a plurality of ports 6, having marginal flanges 7 adapted for insertion in the exhaust ports of the engine to receive the exhaust products of combustion from the explosion chambers. The front wall of the exhaust manifold is formed with a relatively large opening over which is secured a cover plate 8, which is bolted, or otherwise secured to the manifold, and is adapted to be removed to facilitate access to the interior thereof. The cover plate 8 is formed with a flanged exhaust port 9 adapted for connection with the exhaust pipe (not shown) of the engine.

As clearly shown in Fig. 1, the central portion of the exhaust manifold is increased in width and receives the inlet manifold 10, the central portion of which is spaced at the top, bottom and both sides from the corresponding walls of the exhaust manifold 5. The opposite ends of the inlet manifold 10 are reduced and extended rearwardly, as indicated at 11, into the ports 12 of the exhaust manifold 5, the ports 12 being adapted for connection with the inlet ports of the engine. The portion of the wall of the inlet manifold 10 lying opposite the two intermediate exhaust manifold ports 6 are increased in thickness, as indicated at 13, breaking the direct fire, thus spreading the heat more evenly, insuring a more even heat in the inlet manifold 10 and insuring against injury to the inlet manifold due to excessive heating thereof.

The lower central portion of the exhaust manifold 5 is formed with a depending hollow extension 14, having communication with the interior of the inlet manifold 10 by a hollow depending extension 15, which latter is increased in diameter at its lower end, as clearly shown in Fig. 3. The lower end of the extension 14 is connected with the central portion of a horizontally disposed valve housing 16, having depending hollow extensions 17 and 18 in the opposite ends thereof. The portions of the valve housing 16 lying on opposite sides of the hollow extension 14 are internally restricted, as indicated at 19, to present seats for inwardly closing valves 20, carried by stems 21, which are slidably mounted in the end walls of the housing 16 and valve guides arranged inwardly of the valves 20. Expansion springs 22 are coiled about the stems 21 and are confined between the end walls of the housing 16 and the valves 20 and normally tend to close the latter against the seats 19. The valve stems 21 are extended inwardly of the respective valves 20 and are engaged with an eccentric 23, supported upon a shaft 24 rotatably mounted in the valve housing 16 between the valves 20 and are adapted to alternately open the valves during oscillation of the shaft. Externally of the housing, an operating arm 25 is keyed upon the shaft 24 to facilitate adjustment

of the eccentric 23 and the valves 20. The hollow extension 17 of the valve housing is connected with the outlet port of a gasolene consuming carbureter 26, which is connected by a fuel supply pipe 27 with a gasolene tank, not shown. The other extension 18 of the valve housing is connected with the outlet port of a kerosene or other heavier than gasolene hydrocarbon oil carbureter 28, which is connected by a supply pipe 29 with an oil tank (not shown).

The air inlet port 30 of the kerosene carbureter 28 is connected with a hot air pipe 31, provided with a pair of spaced branch pipes 32 in which are arranged pivoted butterfly valves (not shown).

A preferred type of throttle valve 38 is arranged in the depending extension 14 of the exhaust manifold for controlling the passage of gaseous fuel to the cylinders of the engine, and the side walls of the inlet manifold 10 are formed with pairs of ports 39 connected by fire tubes 40, providing passages designed to increase the heat conducting surface of the inlet manifold.

The portions of the valve housing 16 lying outwardly of the valve seats 19 are provided with pockets 41, for containing the condensed fuel which may accumulate therein when the engine is stopped. A pair of drain plugs 42 are secured in the wall of the pockets 42 to facilitate drainage of the condensed fuel.

What I claim is:

In an explosive engine, an exhaust manifold having inlet and outlet ports, an inlet manifold arranged within the exhaust manifold and having pairs of openings in the front and rear walls thereof, fire tubes connecting said openings, and enlargements formed on the intake manifold and arranged opposite to some of the exhaust ports of the exhaust manifold to deflect the exhaust of the engine toward the fire tubes.

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

LESTER E. JOHNSON.

Witnesses:

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