

C. R. SHORT.
HYDROCARBON MOTOR.
APPLICATION FILED DEC. 10, 1917.

1,403,350.

Patented Jan. 10, 1922.

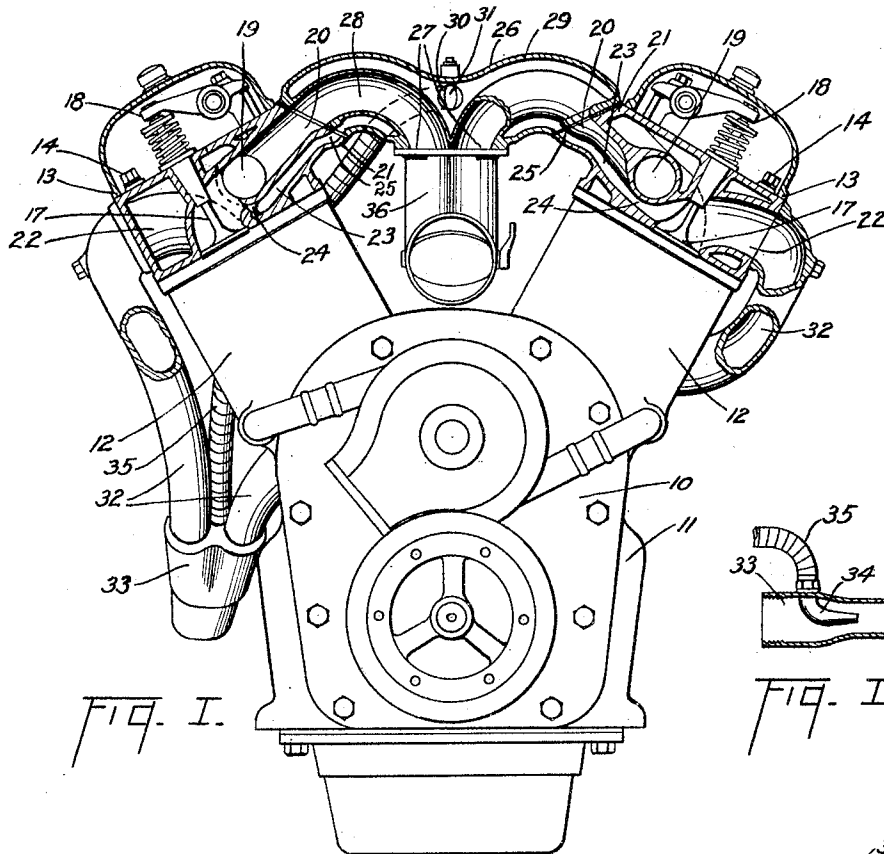


FIG. I.

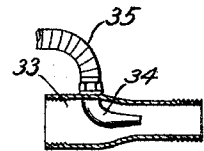


FIG. IV.

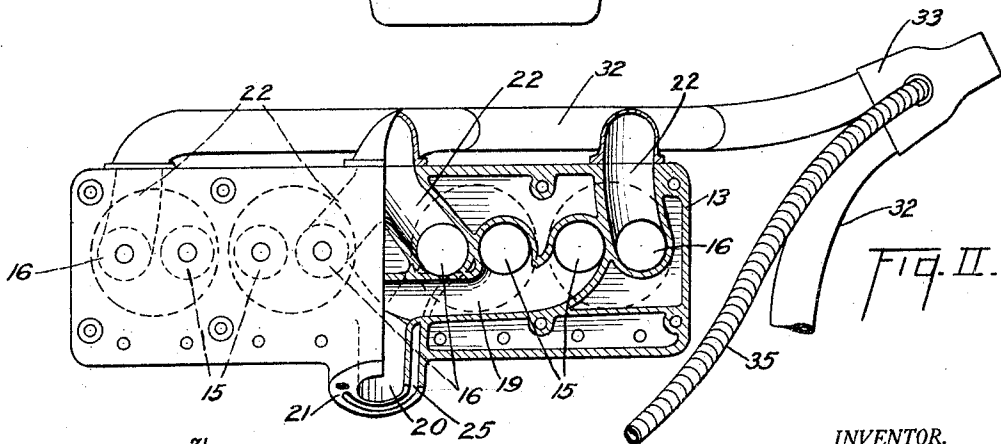


FIG. II.

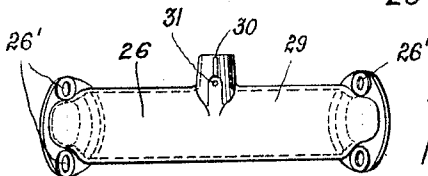


FIG. III.

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HYDROCARBON MOTOR.

1,403,350.

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To all whom it may concern:

Be it known that I, CHARLES R. SHORT, a subject of the King of Great Britain, and resident of Detroit, Wayne County, State of Michigan, have invented certain new and useful Improvements in Hydrocarbon Motors, of which the following is a specification.

This invention relates to improvements on hydrocarbon motors, and more particularly to temperature regulating systems and apparatus therefor.

One of the objects of this invention is to devise a hydrocarbon motor of clean and neat appearance.

Another object of this invention is to devise a hydrocarbon motor in which the incoming gases will be maintained at substantially a constant temperature.

Another object of this invention is to devise a hydrocarbon motor in which the joints about the intake and exhaust manifolds and the cylinder blocks may be readily assembled and made tight.

Another object of this invention is to provide a means for heating the incoming gases of a hydrocarbon motor to a maximum degree when desired.

Another object of the invention is to provide a hydrocarbon motor having a head section in which a minimum number of port surfaces is necessary.

Another object of the invention is to provide a hydrocarbon motor having a head section in which a common intake port is arranged and jacketed by exhaust gases.

These and other objects will more clearly appear from the following description taken in connection with the accompanying drawings, which form a part of this specification and in which:

Figure 1 is an end elevation of a hydrocarbon motor of V type showing the upper portions in section and the invention applied thereto.

Figure 2 is a plan view of a block of cylinder heads partially in section and having an exhaust manifold attached thereto.

Figure 3 is a plan view of the intake manifold, and Figure 4 is a detail longitudinal sectional view of a portion of the exhaust manifold showing a branch exhaust induction pipe connected therewith.

Referring to the drawings—10 represents a hydrocarbon motor having a crankcase 11

with cylinder blocks 12 secured thereon in V relation one to the other.

Each block of cylinders 12 has a head section 13 bolted to the top as by bolts 14. Each head section 13 has a plurality of intake and exhaust ports 15 and 16 respectively, arranged in alignment along the length thereof, and each fitted with the customary valves 17 and valve mechanism 18.

The intake ports 15 of each cylinder head section communicate with a common passage 19, which in turn communicates with the common intake 20, shown in the drawings as formed intermediate of the length of the cylinder head section where a suitable boss 21 is arranged to provide a finished joint surface.

The exhaust ports 16 of each cylinder head section are connected through passages 22 with the outer side of the head, and, as shown in the drawings, the two central exhaust ports are also connected by passages 23 cored under the common intake passage 19 as at 24 arranged concentrically with the common intake 20 as at 25, whereby the common intake is concentrically jacketed by the cored passage 23 which also appears on the plane surface of the boss 21.

A combined intake and exhaust manifold 26 is arranged between the V blocks of the cylinders to bridge the space and is secured to the plane surfaces of the bosses 21 by suitable screws inserted through the holes 26', said manifold having a common inlet opening 27, from which the intake or inlet passages 28 extend in opposite curves to the intake passages 20.

The manifold 26 is also formed with the jacket 29 surrounding the intake passages 28 and opening at the end of said manifold to register and connect with the exhaust ports 25 surrounding the intake ports 20. The jacket 29 has an outlet 30 arranged in the center thereof, said outlet having a valve 31 preferably of the butterfly type suitably arranged therein whereby it may be adjusted to control the extent of said opening.

The exhaust passages 22 where they open on the side of the head section are interconnected, one with the other, by the exhaust manifold 32. The manifold 32 of each header is continued to the rear of the motor, where they are brought together to a common Y outlet or exhaust 33. The Y member 33 is provided as particularly shown in Fig-

ure 4 with an elbowed nozzle 34, turned in the direction of flow of gases through said Y and connected as by the flexible pipe 35 with the outlet opening 30 in the jacket 29.

5 It will be seen from the foregoing description that all the parts in connection with the intake and exhaust apparatus of the motor are cleanly and compactly arranged with substantially one common intake branch to the blocks of cylinder and three outlet or ex-
10 haust pipes, namely one from each block of cylinders and one from the intake jacket, all said outlets combining in the one Y outlet 33.

15 A carburetor 36 is shown attached to the intake manifold opening as customary with hydrocarbon motors.

The general arrangement of parts and intake and exhaust passages as described will
20 maintain a practically constant working temperature in and about the cylinder heads, whereby all explosive gases entering the cylinders will do so at a predetermined and regulated temperature, and thus secure
25 proper efficiency.

The action of the exhaust gases upon the pipes and passages serving to convey the intake or incoming gases will be practically automatically controlled, that is, the higher
30 the speed of the engine the greater the volume of explosive gas entering through the intake passages, and likewise the greater the amount of heated exhaust gases circulated above said intake passages, whereby the in-
35 coming gases are heated with a proportionate amount of heat directly in ratio to the amount of gases entering the cylinder, and it must be understood in this connection that the customary water jacket shown as sur-
40 rounding all passages, cored and extending throughout the cylinder head sections will act to ameliorate and equalize or regulate any tendency to excessive changes in temperature which might otherwise occur.

45 While I have described and will claim the preferred embodiment of my invention, it will be obvious to those skilled in the art that many modifications and changes may be made without departing from the scope of the invention.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:

1. In a hydrocarbon motor, a cylinder
55 head having an intake passage, an intake port therefor, and an exhaust port; an exhaust valve adapted to control the flow of exhaust gases through said exhaust port; and two passages formed in said head and lead-
60 ing from said port, and through both of which exhaust gases may flow, one of said exhaust passages being contiguous to said intake passage adjacent to said intake port.

2. In a hydrocarbon motor, a cylinder head
65 having an intake passage and an exhaust

port; an exhaust valve adapted to control the flow of exhaust gases through said exhaust port; and two passages formed in said head and leading from said port and the outlet
70 ends of which passages are located at opposite sides of said head, and through both of which passages exhaust gases may flow, one of said exhaust passages arranged about said intake passage within said head.

3. In a hydrocarbon motor, a cylinder
75 head having an exhaust port; an exhaust valve adapted to control the flow of exhaust gases through said exhaust port; two passages formed in said head and leading from said port and through both of which exhaust
80 gases may flow; and an inlet passage formed in said head and the inlet end of which is arranged concentric with the outlet end of one of said exhaust passages, the inlet end of said
85 inlet passage and the outlet end of the exhaust passage with which said end is concentric being located at one side of the cylinder head.

4. A hydrocarbon motor having a cylinder
90 head formed with a cored passage common to a plurality of intake ports, and having a common inlet on one side of said head, an exhaust outlet on the opposite side of said head, and common to a plurality of exhaust
95 ports, and a bypass extending from said exhaust passage to and about said inlet passage.

5. In a hydrocarbon motor, a cylinder
head having concentric openings leading into an inlet and an exhaust passage, and separate
100 inlet and exhaust ports with which said passages respectively communicate; and a manifold having concentrically arranged mixture supply and exhaust gas passages which register with the concentric openings aforesaid
105 in said cylinder head.

6. In a hydrocarbon motor, a cylinder
head having concentric openings leading into an inlet and an exhaust passage, and separate
110 inlet and exhaust ports with which said passages respectively communicate, and a second exhaust passage leading from said exhaust port; and a manifold having concentrically arranged mixture supply and exhaust gas passages which register with the
115 concentric openings aforesaid in said cylinder head.

7. A hydrocarbon motor having a pair of
cylinder blocks arranged in V formation, head
120 sections fitting said cylinder blocks and each having a plurality of inlet ports with a common outlet on the inner side of said head sections and a plurality of exhaust ports on the outer side of said head sections and a bypass
125 leading from an exhaust port to the inner side of the head about the inlet port thereof, a manifold bridging the head sections of said motor between the inlet ports thereof and having a central inlet passage there-
through and a concentric exhaust passage, and
130

bridging the inlet and by-pass exhaust ports in said cylinder head sections.

5 8. A hydrocarbon motor comprising a pair of cylinder blocks arranged in V relation, one to the other, cylinder head sections fitting said cylinder blocks and each having a plurality of outlet passages along the outer side thereof and a bypass from an outlet passage to the inner side of said head sections,
10 an intake manifold bridging said intakes and having a jacket formed therearound communicating with said bypass, an exhaust pipe communicating with said outlet pas-

sages and said manifold jacket, and a valve controlling the outlet from said jacket. 15

9. A hydrocarbon motor comprising a plurality of cylinder blocks arranged in V relation, each block having inlet and exhaust ports arranged on a common plane surface, and common manifold having intake and
20 exhaust passages therethrough and bridging said blocks and secured thereto over said inlet and exhaust ports on the faces of said plane surfaces.

In testimony whereof I affix my signature. 25
CHARLES R. SHORT.