J. G. VINCENT.

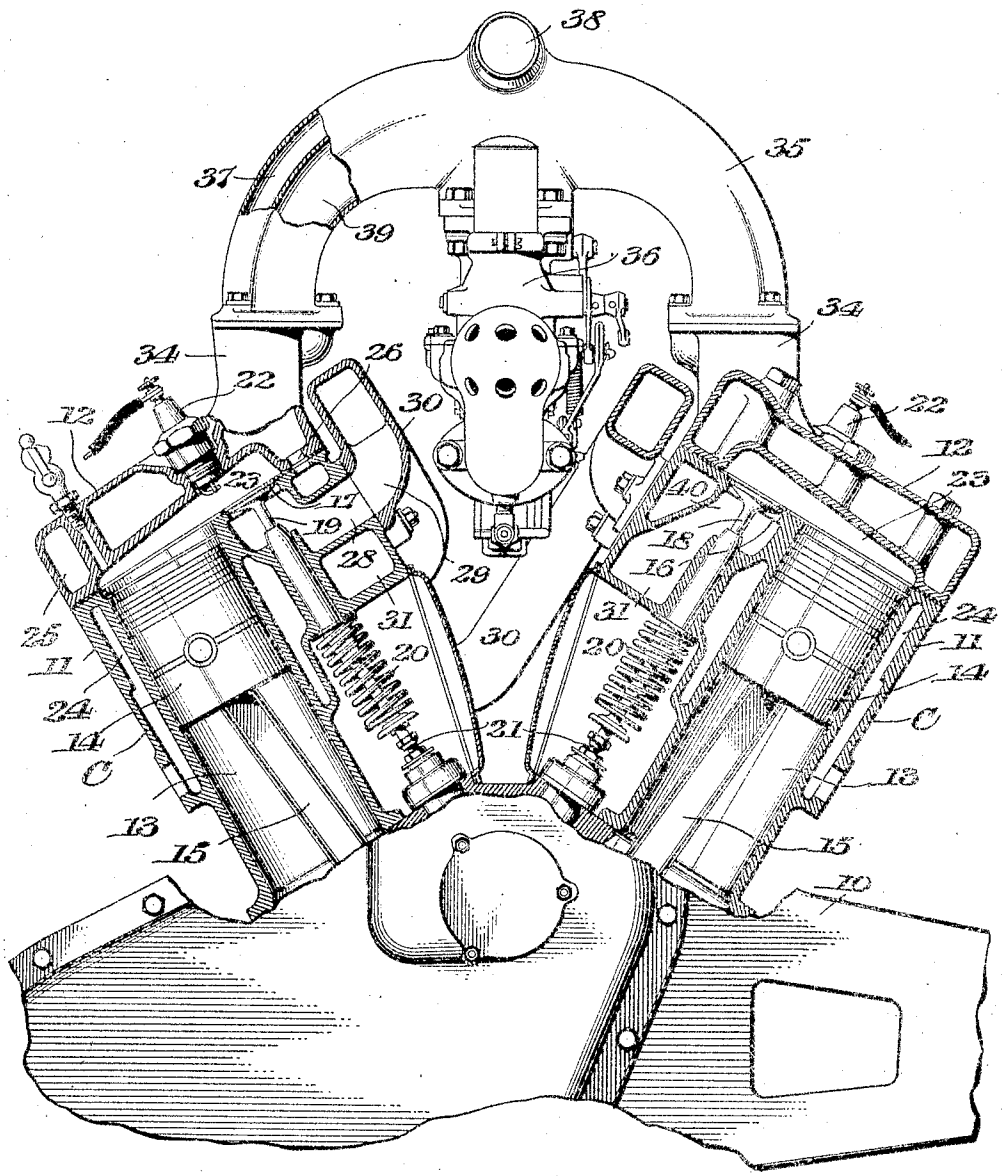
HYDROCARBON MOTOR.

APPLICATION FILED DEC. 17, 1917.

1,352,486. Patented Sept. 14, 1920.

2 SHEETS—SHEET 1.

Fig. 1.



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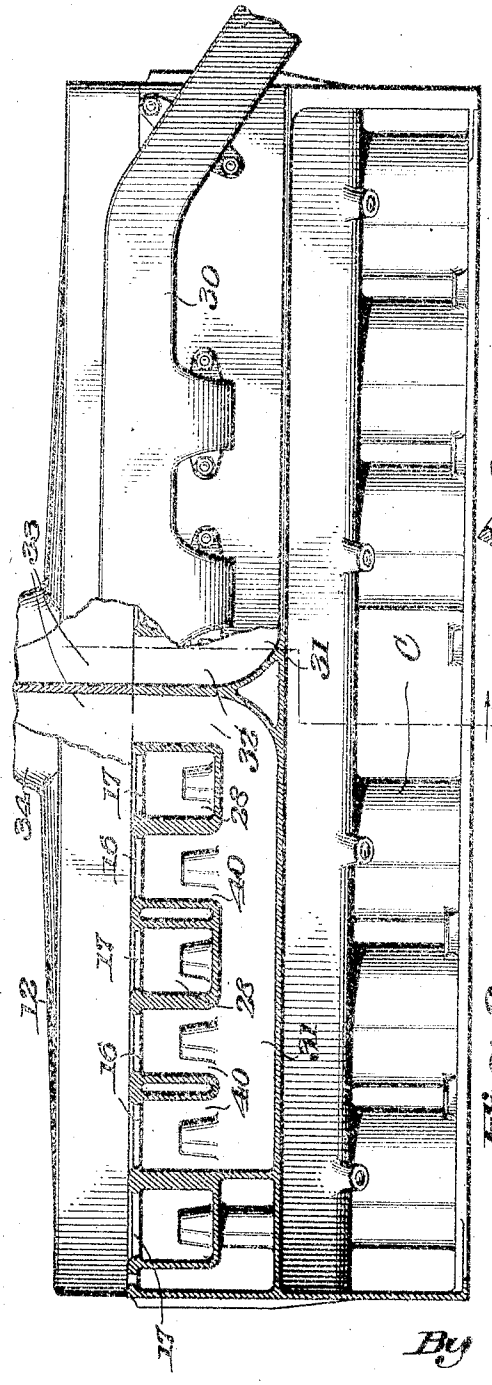


Fig. 2.

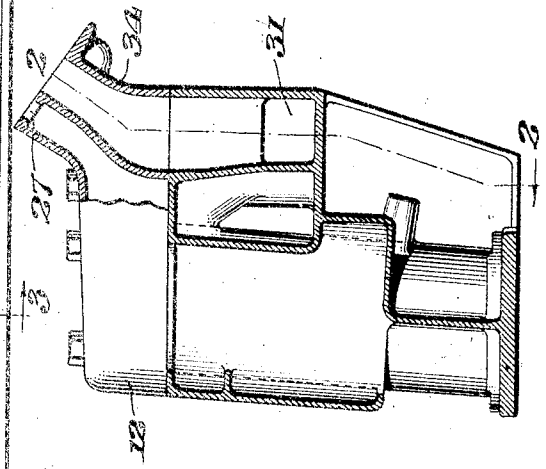


Fig. 3.

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UNITED STATES PATENT OFFICE.

JESSE G. VINCENT, OF DETROIT, MICHIGAN, ASSIGNOR TO PACKARD MOTOR CAR COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

HYDROCARBON-MOTOR.

1,352,486. Specification of Letters Patent. Patented Sept. 14, 1920.

Application filed December 17, 1917. Serial No. 207,560

To all whom it may concern:

Be it known that I, JESSE G. VINCENT, a citizen of the United States, 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 hydrocarbon motors and particularly to the construction and arrangement of the cylinders and intake and exhaust passages.

One of the objects of the invention is to so form the intake and exhaust passages in the motor cylinder blocks as to facilitate manufacture thereof.

Another object of the invention is to form the intake passages of the cylinder block with as few turns as possible while at the same time providing for heating the passages from the exhaust passages.

Another object of the invention is to arrange the intake passage of a cylinder block in the cylinder casting with a single communication through the cylinder head casting to the intake pipe.

Another object of the invention is to arrange the exhaust passages of a motor cylinder block so that free egress for the gases is obtained while at the same time the intake passages are properly heated.

Other objects of the invention will appear from the following description taken in connection with the drawings, which form a part of this specification, and in which:

Figure 1 is a vertical transverse sectional view through a V-type motor embodying the invention;

Fig. 2 is a part elevation and part longitudinal sectional view through one of the cylinder blocks shown in Fig. 1, the section being substantially on the line 2—2 of Fig. 3; and

Fig. 3 is a transverse section on the line 3—3 of Fig. 2.

Referring to the drawings, 10 represents a motor crank case upon which are mounted a pair of cylinder blocks C. It is intended that each entire block including its cylinder and head castings and other appurtenances shall be referred to as a cylinder block and indicated by the reference letter C, but in some instances the cylinder casting alone may be hereinafter referred to as a cylinder block. But one of the two cylinder blocks will be described in detail and it will be understood that they are alike in all essential particulars except of course that the valves and gas passages are on the right hand side of the left block and on the left hand side of the right block.

The essential parts of each of the cylinder blocks are a cylinder casting 11 and a detachable head casting 12. These blocks are mounted upon the crank case 10 in V-arrangement as shown in Fig. 1 and within each of the cylinder bores 13 is a piston 14 operated by a connecting rod 15, the latter being connected to the crank shaft of the motor, not shown.

A series of ports, both intake and exhaust, are arranged in the cylinder casting along one side of the cylinders, the intake ports being indicated at 16 and the exhaust ports at 17. These ports are provided with valves 18 and 19 respectively, the latter being controlled by springs 20 and push rods 21 from a suitable cam shaft mounted in the crank case and not shown. For the operation of the motor spark plugs 22 are suitably provided in communication with the combustion chamber 23 formed above the piston 14. Also, the cylinder and head castings are formed with suitable water jackets 24 and 25 which are supplied with cooling water from a suitable pump, the jackets in the cylinder and head castings respectively being connected as by a passage 26 shown at the left hand side in Fig. 1 and the outlet from the cylinder heads being shown at 27 in Fig. 3.

Formed in the cylinder castings or blocks 11 are exhaust passages or conduits 28 which extend laterally from the respective exhaust ports 17 to the outside or outer face of the block. There these passages are in communication with various openings 29 in a detachable exhaust pipe or header 30. There are of course two of these exhaust pipes 30 and they extend lengthwise of the two cylinder blocks C and in the V formed by the blocks. This arrangement of exhaust passages provides very free egress for the gases

from the combustion chamber through the exhaust ports 17.

Arranged directly beneath the lateral exhaust passages 28 is an elongated intake conduit 31, parts of the walls of said passages 28 forming parts of the upper walls of said intake conduit so that the heat from the exhaust gases passing through said passages 28 is directly transferred to the conduits 31 to thereby heat the incoming gases therein. Upon reference particularly to Fig. 2 it will be seen that there are two of these passages 31 for each cylinder block when a block of six cylinders is used as in said figure, and these conduits 31 have adjacent upturned ends as at 32 which extend the conduits up to the upper surface of the cylinder casting. At this point the head casting 12 is formed with a pair of intake passages 33 therethrough, which passages are respectively in register with the ends 32 of the intake conduits 31 of the cylinder casting. An integral extension 34 on the head casting carries the passages 33 upwardly somewhat, as shown particularly in Figs. 1 and 3, and an intake pipe 35, shown as of arched formation, connects the two extensions 34 of the respective cylinder blocks as shown in Fig. 1. The intake pipe 35 carries a carbureter 36 and it may if desired be formed with a passage 37 and an outlet 38 for the water from the water jackets of the cylinder blocks. Its main passage 39, however, conveys the combustible mixture from the carbureter 36 to the passages 33 in the head casting and thence downwardly through the upturned ends 32 into the intake conduits 31.

At the right in Fig. 1 it will be seen that there is a diagonally extending branch passage 40 leading from the intake conduits 31 to each of the intake ports 16 so that the combustible gas is conveyed directly from the conduit 31 to said intake ports. Thus the incoming gas has but two distinct turns to make from the time it leaves the intake pipe 35 until it passes one of the ports 16, that is, the turn where it passes from the passage 32 to the conduit 31 and the second turn where it passes from the latter conduit to the direct passage 40.

It will be understood further that my invention is not limited to the details of construction shown and other forms may be used without departing from the spirit or scope of the invention.

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

1. A motor cylinder block having a series of intake and exhaust ports in line, and having walls forming conduits which lead separately and laterally from the exhaust ports to the outer face of the block, the said block having a longitudinally extending intake conduit therein common to said intake ports and into which said walls of the lateral conduits of all of said exhaust ports extend.

2. A motor cylinder block having the following ports and conduits formed therein: a series of intake and exhaust ports arranged in line, an intake conduit running lengthwise of the block adjacent the valves, branch conduits from said intake conduit to the various intake valves, a branch conduit leading from the top of the block downwardly to the intake conduit, and exhaust conduits leading laterally away from the exhaust ports, the walls of said exhaust conduits projecting into said intake conduit.

3. In a hydrocarbon motor, the combination with a cylinder block, of a detachable head therefor, said block having an intake conduit extending lengthwise thereof and turned upwardly at one end to the head, and said head having an intake passage therethrough registering with the intake conduit in the block.

4. In a hydrocarbon motor, the combination with a cylinder block, of a detachable head therefor, said block having an intake conduit extending lengthwise thereof and turned upwardly at one end to the head and having exhaust passages extending laterally to the outer face of the block, and said head having an intake passage therethrough registering with the intake conduit in the block.

5. In a hydrocarbon motor, the combination with a cylinder block, of a detachable head therefor, said block having two alined intake conduits extending lengthwise thereof and turned upwardly at adjacent ends to the head, and said head having a pair of adjacent intake passages therethrough registering with intake conduits in the block.

6. In a hydrocarbon motor, the combination with a cylinder block having a lengthwise extending intake conduit with an upturned end and having laterally extending exhaust passages, of a detachable head for the block having an intake passage therethrough registering with said upturned end, and a detachable exhaust pipe adapted to connect with said exhaust passages.

7. A motor cylinder block having the following characteristics: a plurality of valved intake and a plurality of valved exhaust ports arranged in line at one side of the cylinders, exhaust passages leading from the exhaust ports laterally directly to the outside of the block, a longitudinal exhaust pipe outside of said block and communicating with said passages, an elongated intake conduit within the block arranged directly beneath the exhaust passages so that parts of the walls of said passages form parts of the upper walls of said intake conduit, and intake branches leading from said conduit to the intake ports.

8. In a hydrocarbon motor, the combina-

tion with a pair of adjacent cylinder blocks each comprising a cylinder casting and a detachable head casting, and each cylinder casting having an intake conduit extending lengthwise thereof with an upturned end, and each head casting having an intake passage therethrough registering with the upturned end of the intake conduit of its respective cylinder casting, and an intake pipe connected to both of said head castings and registering with the intake passages therein.

In testimony whereof I affix my signature.

JESSE G. VINCENT.