C. F. JOHNSON.

HYDROCARBON MOTOR.

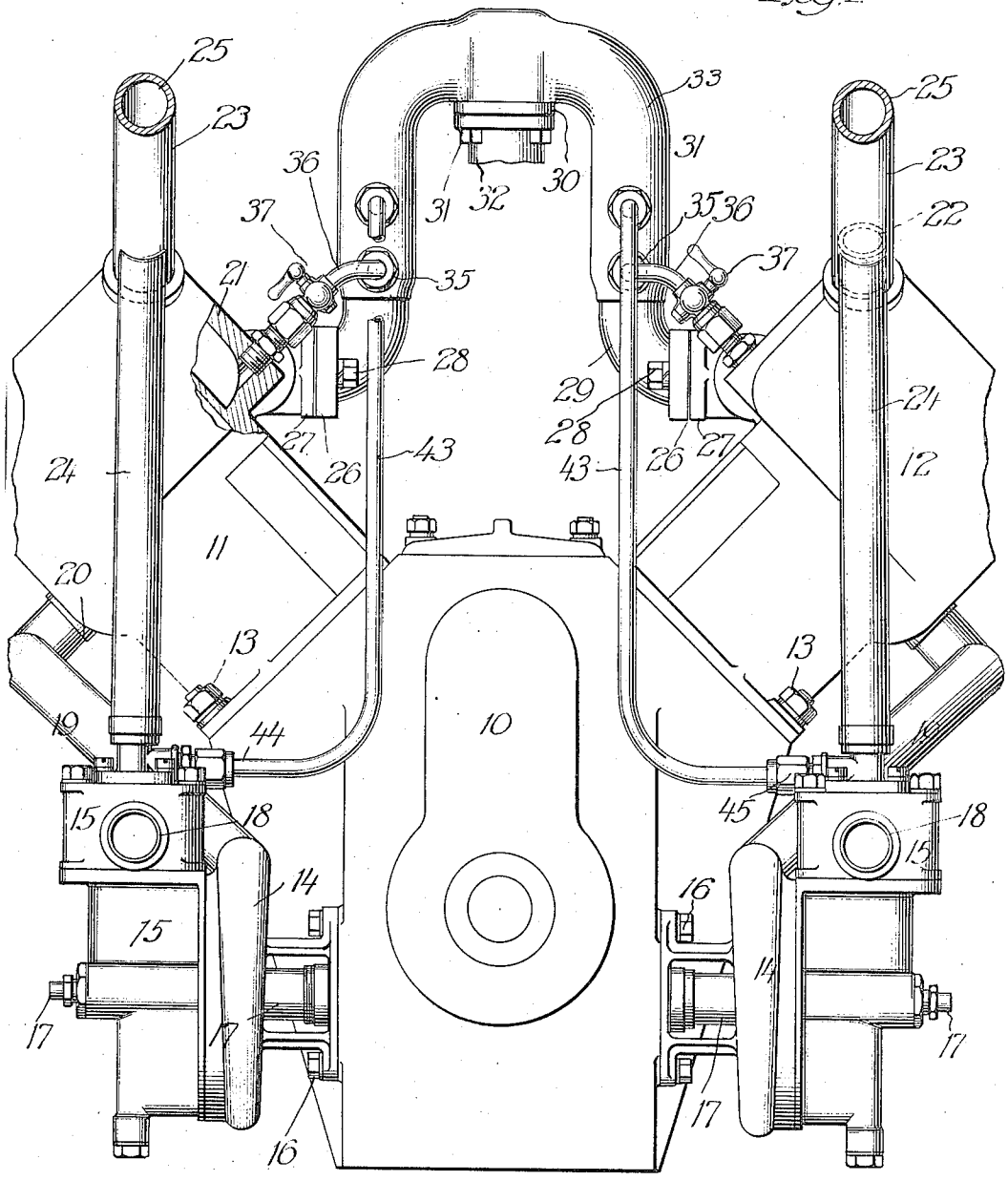
APPLICATION FILED DEC. 2, 1915.

1,260,388.

Patented Mar. 26, 1918.

2 SHEETS—SHEET 1.

Fig. 1.



Witness

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2 SHEETS—SHEET 2.

Fig. 5

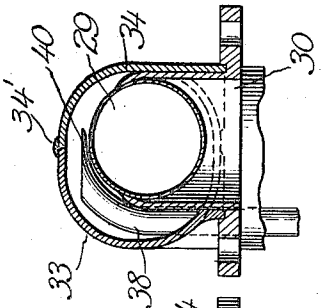


Fig. 3

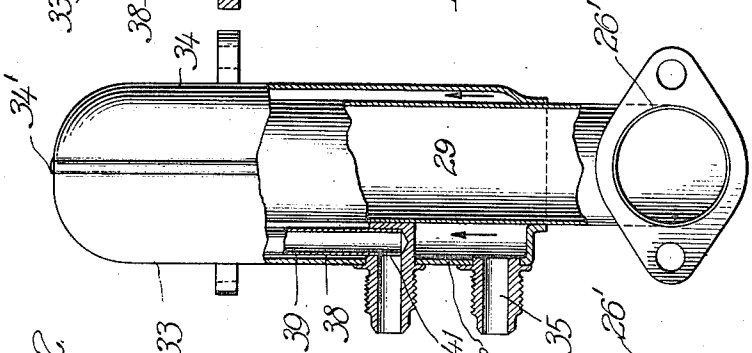


Fig. 4

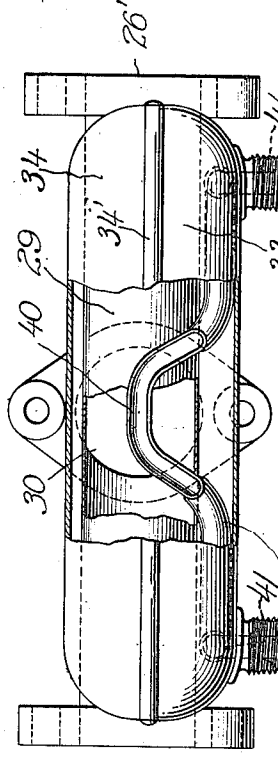
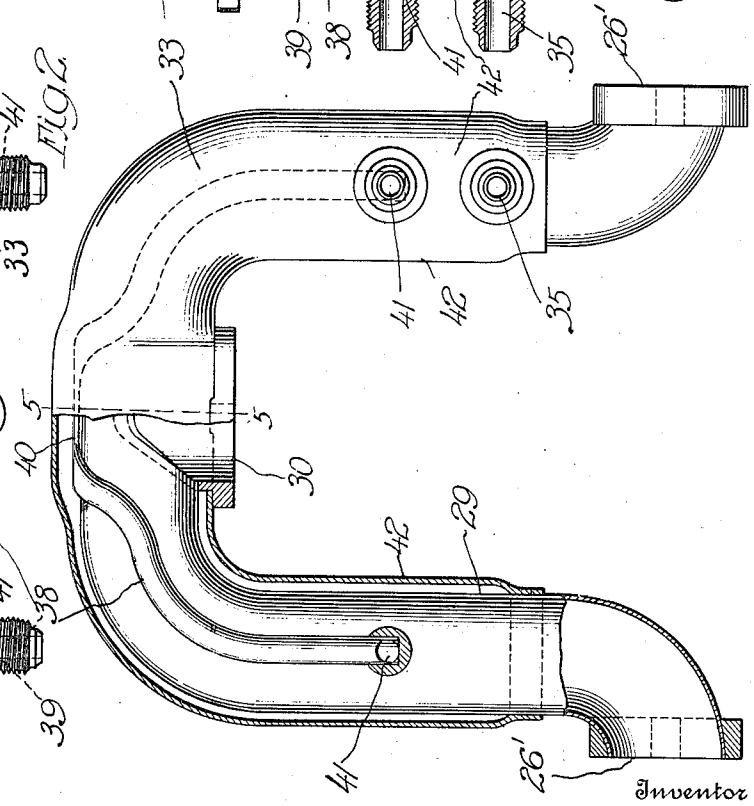


Fig. 2



Witness

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UNITED STATES PATENT OFFICE.

CHESTER F. JOHNSON, OF DETROIT, MICHIGAN, ASSIGNOR TO CADILLAC MOTOR CAR COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

HYDROCARBON-MOTOR.

1,260,388. Specification of Letters Patent. Patented Mar. 26, 1918.

Application filed December 2, 1915. Serial No. 64,621.

To all whom it may concern:

Be it known that I, CHESTER F. JOHNSON, 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 water circulating system thereof.

In a hydrocarbon motor, provided with previous water jacketed intakes embodying single path circulating systems, it has been found, frequently, that the temperature of the gas in various parts of the intake was not of uniform quality, because of the difference of temperature in different parts of the jacket. This condition, of course, results in an uneven and erratic firing of the charges in the cylinders; therefore, one of the salient objects of this invention is to improve the water circulating system in general, as applied to internal combustion engines, and particularly an improved arrangement of the circulating paths in the jackets for the gas intake and the cylinders of hydrocarbon motors, thus materially increasing the efficiency and the operation of this type of motor.

Another object is an arrangement of circulating paths, which will minimize the difference in temperatures of the cooling medium in the various cylinder blocks of a multicylinder motor, and at the same time providing means for producing a uniform gas mixture feeding to the various cylinders of the motor.

Another object is to provide a hydrocarbon motor having a plurality of water cooled cylinder blocks, each of which may have an independent circulating cooling system, so arranged that a portion of the cooling water from each of the blocks may be conducted to a common jacket for the gas intake or carbureter.

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

Figure 1 illustrates a front elevation, with portions broken away, of a hydrocarbon motor embodying a preferred form of this invention;

Fig. 2 is an enlarged front elevation, with portions in section, of the gas intake and jacket, illustrated in Fig. 1;

Fig. 3 is a side elevation, with parts in section, of the intake and jacket shown in Fig. 2;

Fig. 4 is a plan view, with parts broken away, and others in section; and

Fig. 5 is a transverse vertical section, substantially on the line 5—5 of Fig. 2.

Referring to the drawings, 10 represents a crank case; 11 and 12 a plurality of cylinder blocks mounted thereon, as by bolts 13, in V relation. Each of the cylinder blocks may be provided with an independent liquid circulating system, comprising a circulating means or pump mechanism 14, having a casing 15 detachably secured to one side of the crank case 10, as by bolts 16. The pump may be of the well known centrifugal type, provided with a shaft 17, which may be suitably driven in any well known manner from a desired part of the motor. The casing 15 is provided with an intake port 18 and a discharge conduit 19, which is adapted to communicate with an inlet port 20, formed in the jacket 21.

Each jacket is also provided with an outlet port 22, to which a flexible conduit, provided with the branch 23 and bypass 24, may be connected. The bypass 24 forms a short return to the upper part of the pump casing 15, and the branch 23 is provided with a discharge port 25, which may lead to the upper part, as desired, of a cooling means common to both of the cylinder blocks, such as the usual radiator, not shown.

It will be understood also that the intake port 18 of the pump casing may have a connection with a lower part of the radiator, if desired, for forming a self contained circulating system, or this intake port may be connected with a source of supply of fresh cooling medium.

Suitable automatic regulators for directing the circulating medium either through each of the bypasses 24, thus forming an independent cooling system for each of the blocks 11 and 12, or through the branches 23 to a common radiator, may be arranged in the casing 15.

Each of the cylinder blocks is provided with a gas inlet header having port 26, and also provided with flanged portions 27, to

which may be secured, as by bolts 28, the opposite ends or outlet ports of a common U shaped gas intake 29. This gas intake is provided with an inlet port 30 intermediate its ends, and is adapted to have secured thereto, as by bolts 31, a carbureter 32, of any well known form. A heating jacket for the gas intake comprises a two part tubular shell, comprising casing members 33 and 34, which may be castings, and adapted to be arranged on the intake and secured in position by welding or brazing them together, as at 34'. Formed in the shell, adjacent the gas outlet port 26', a heating medium intake port 35, which may be connected to the upper part of the cylinder jacket 21, as by a conduit 36, for leading a portion of the cooling medium from the jacket 21 to the lower part of the gas intake jacket, for circulating therethrough and heating the same. A shut-off cock 37 may be arranged in the conduit 36 for regulating the circulation through the jacket 33—34. A tube 38 may be suitably arranged or cast in the shell member 33, forming a U shaped channel 39, provided with a port 40 communicating with the interior of the jacket intermediate its ends, or adjacent the gas inlet port 30. This channel is also provided with an outlet port 41 arranged in each of the branches 42 of the jacket at a point just above the heating medium inlets 35. The ports 41 are adapted to be connected, as by conduits 43, to the casing 15 of one of the pump mechanisms 14, as at 44 and 45.

It is believed that from the foregoing description, it will be understood that water is adapted to be taken from the upper part of the jackets 21 of the cylinder blocks 11 and 12, respectively, and fed to the lower part of each of the branches 42 of the heating jacket of the gas intake, whence it is adapted to be circulated upwardly in a direction opposite to the flow of the gases in the intake, and the water from each of the branches is taken from the upper central part of the jacket adjacent the gas intake port 30 into the port 40, whereby it may be distributed by the channels 39, ports 41 and conduits 43 to either or both of the casings 15; in other words, this heating jacket is provided with means for taking water from the cylinder jackets of either one or both of the blocks and returning the circulating medium to the blocks from which it was taken, or mixing it with the water from another block. In this way the main body of water flowing through each of the blocks may have an independent circulation, and at the same time, the heating jacket for the gas intake provides means for equalizing the temperature of the cooling medium in the independent circulating paths; further, with my system the hottest water flowing to the gas intake jacket is taken in at the points where its action is most efficient; namely adjacent where the gases leave the intake and enter the respective cylinder blocks, and is then circulated to obtain the most uniform heating of the various parts of the jacket.

While I have described and illustrated a preferred form of my invention, it will be understood that various modifications and changes may be made, by one skilled in the art, without departing from the spirit or scope of the invention, and which will be covered hereby.

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

1. The combination of a gas intake having an inlet port and an outlet port, with a heating jacket for said intake provided with an inlet port adjacent said intake outlet port and with an outlet port adjacent said intake inlet port, whereby the incoming gas and the heating medium flow in opposite directions.

2. The combination of a gas intake provided with an inlet port adjacent its upper portion, and a plurality of outlet ports arranged below said first portion, of a heating jacket for said intake, provided with an inlet adjacent each of said outlet ports, said jacket being provided with an outlet, and means for circulating a heating medium from points adjacent said gas outlets toward said gas inlet port.

3. The combination of a U shaped gas intake, provided with an inlet port, said intake also having an outlet port formed in the ends of each of its branches, said branches extending in a downwardly direction, of a heating jacket for said intake, comprising an outlet adjacent said gas intake port, said jacket also having a pair of inlets arranged adjacent each of said gas outlet ports, and means for circulating the heating medium in an upwardly direction opposite to the flow of the gases in said intake.

4. A gas intake, comprising a pair of downwardly extending branches provided with ports in each end and another port formed intermediate its ends, of a heating jacket for said intake, comprising a port adjacent each of said end ports, and a port adjacent said intermediate port.

5. A gas intake, comprising a pair of downwardly extending branches provided with ports in each end and another port formed intermediate its ends, of a heating jacket for said intake, comprising a port adjacent each of said end ports, and a port intermediate said end ports, and a plurality of means for communicating with said jacket end ports.

6. The combination with a U shaped gas intake, provided with a port adjacent each of its ends, and with another port interme-

diate its ends, of a heating jacket for said intake comprising a U shaped channel, provided with a port adjacent each of its ends, and with another port intermediate its ends.

7. The combination with a U shaped gas intake, provided with a port adjacent each of its ends, and with another port intermediate its ends, of a heating jacket for said intake comprising a shell having an inlet port adjacent its bottom, an outlet channel formed in said shell, said channel having a port communicating with the inside thereof adjacent said gas inlet port, said channel also having a port leading from said shell.

8. The combination with a U shaped gas intake, provided with an outlet port adjacent each of its ends, and also being provided with another port intermediate its ends, of a heating jacket for said intake, comprising a shell, said shell being provided with an inlet port adjacent each of said gas outlet ports, said shell having a channel formed therein, provided with a port communicating with the interior of the jacket adjacent said gas inlet port, said channel also being provided with a port leading to the exterior of said shell.

9. The combination with a U shaped gas intake, provided with an outlet port adjacent each of its ends, and also being provided with another port intermediate its ends, of a heating jacket for said intake, comprising a shell, said shell being provided with an inlet port adjacent each of said gas outlet ports, said shell having a channel formed therein, provided with a port communicating with the interior of the jacket adjacent said gas inlet port, said channel also being provided with ports leading to the exterior of said shell at points remote from gas inlet.

10. In a hydrocarbon motor, the combination with a plurality of cylinder blocks, each adapted to have a cooling jacket provided with independent circulating paths, and a common gas intake for said cylinders, of a heating jacket for said intake, and means for conducting a portion of the water from each of said cylinder jackets to said heating jacket.

11. In a hydrocarbon motor, the combination with a plurality of cylinder blocks, each adapted to have a cooling jacket provided with an independent circulating path, and a common gas intake for said cylinders, of a heating jacket for said intake, means for conducting a portion of the water from each of said cylinder jackets to said heating jacket, and parallel paths for returning the cooling medium to the respective cylinder blocks.

12. In a hydrocarbon motor, the combination with a plurality of cylinder blocks, each having a cooling jacket, provided with an independent circulating path, and a common gas intake for said cylinders, of a heating jacket for said intake, said intake being provided with means for conducting a portion of the water from the jackets of each of said blocks, said heating jackets being provided with a common outlet port leading to each of said blocks.

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

CHESTER F. JOHNSON.

Witnesses:

RICHARD HARFST,

F. L. DAVIS.