J. G. VINCENT.

HYDROCARBON MOTOR.

APPLICATION FILED JUNE 26, 1916.

1,332,964.

Patented Mar. 9, 1920.

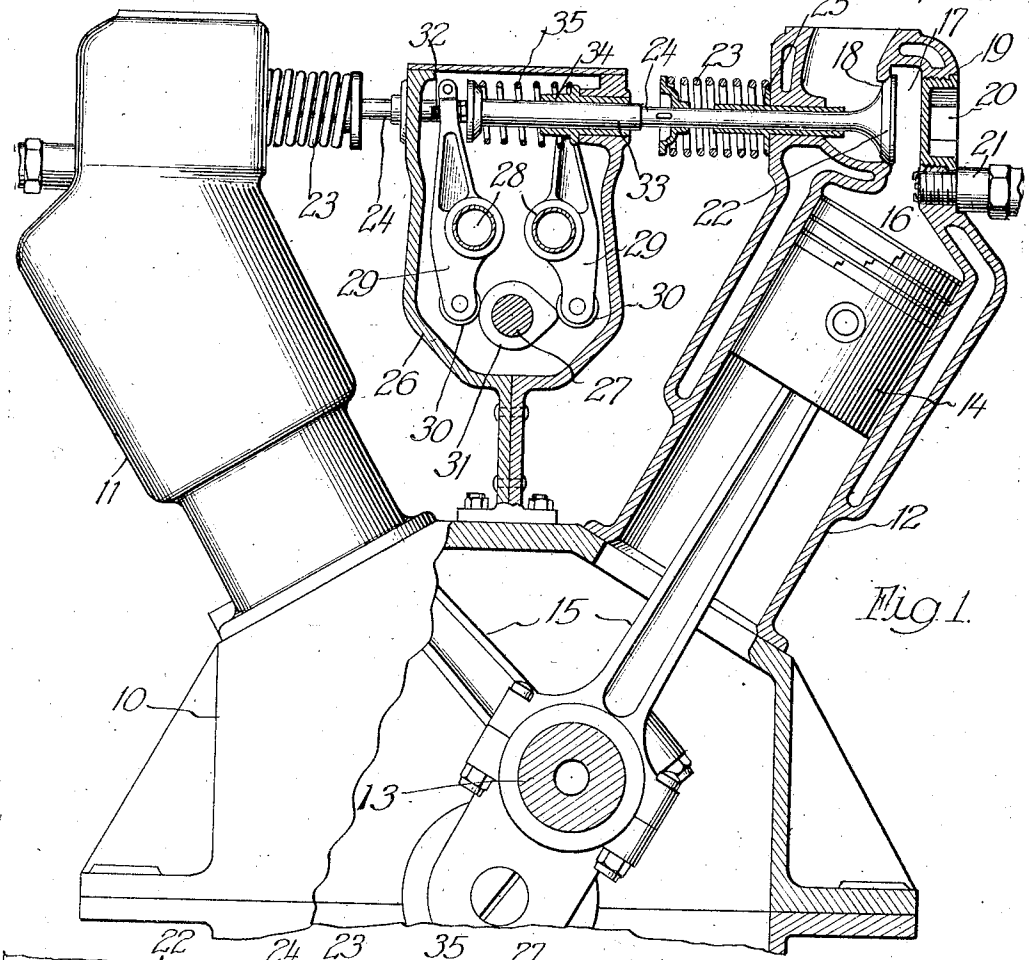


Fig. 1.

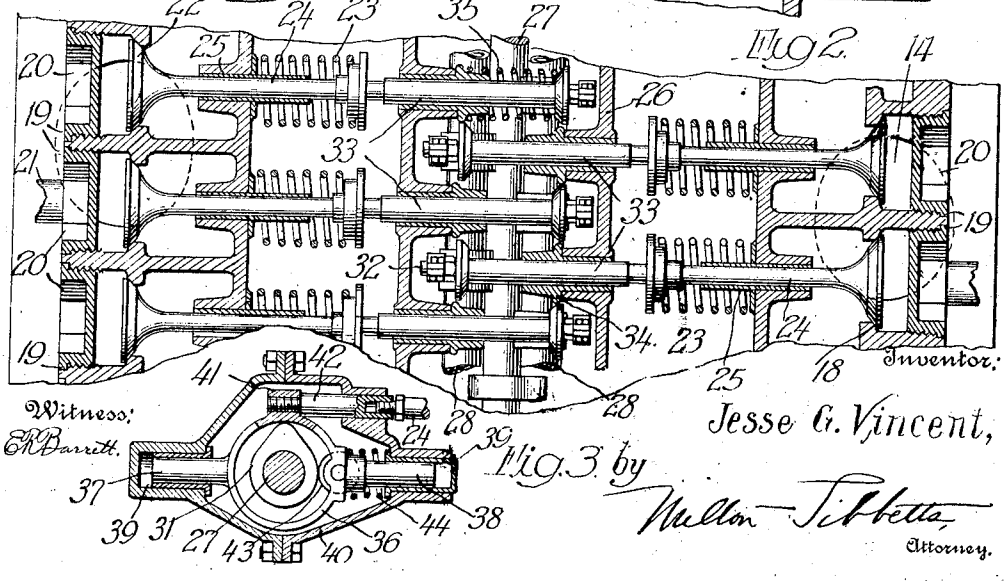


Fig. 2.

Fig. 3.

Witness:
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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.

1,332,964. Specification of Letters Patent. Patented Mar. 9, 1920.

Application filed June 26, 1916. Serial No. 106,051.

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 V-type motors in which the valve operating mechanism is arranged between the cylinder castings.

One of the objects of the invention is to provide a support for the valve operating mechanism separate from the cylinders.

Another object is to provide parallel supports for two sets of rock arms for operating the various valves of the cylinders.

Another object is to provide springs for seating the valves and additional springs tending to move the push rods away from the valves.

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 view partly in section of a hydrocarbon motor embodying one form of the invention;

Fig. 2 is a sectional plan view; and

Fig. 3 is a detail view of another form of valve operating mechanism.

In the drawings, 10 designates the crank case of a hydrocarbon motor on which are mounted two blocks of cylinders 11 and 12 in V relation. A crankshaft 13 is mounted in the crank case and is connected to the cylinder pistons 14 by connecting rods 15.

Each cylinder is provided with a combustion space 16 and vertically extending valve pockets 17. On the inner side of each of the pockets are provided inlet and exhaust ports 18 and on the outer side, opposite these ports, are openings 19 normally closed by plugs 20. Spark plugs 21 are mounted in the cylinders in communication with the combustion space.

Valves 22, preferably of the puppet type, control the ports 18 and are yieldingly held to their seats by springs 23 surrounding the valve stems 24 which are mounted in guides 25 and extend inwardly from the cylinders in a horizontal plane.

Mounted on the crank case 10 between and independently of the cylinders is a casing 26 for inclosing the valve operating mechanism. A cam shaft 27 suitably driven from the crank shaft 13 is rotatably mounted in the casing 26. Above and on either side of the cam shaft are parallel shafts 28, on which rock arms 29, arranged in staggered relation, oscillate. The lower end of each rock arm carries a roller 30 which bears against an actuating cam 31 on the shaft 27 while the upper end is split to adjustably clamp a pin 32 by which the oscillation is transmitted to the valve stem through push rods 33. The push rods 33 are mounted in the casing 26, each rod being alined with a valve stem to transmit the impulse from the rocker arm to its respective valve stem. Each push rod is guided by a sleeve 34 and yieldingly held against the rocker arm by springs 35. The valve stems are yieldingly held in contact with the push rods by the springs 23 so that the valve stems follow the return movement of the push rods.

Fig. 3 shows another form of valve operating mechanism. In this form the push rod 42 which operates against the valve stem 24, is secured in an ear 41 on a ring 36 surrounding the cam 31. A roller 43 follows the cam, and alined pins 27 and 38 projecting from the ring into pockets 39 in the inclosing casing 40 form guides for the structure. A spring 44 surrounding one of the pins holds the roller 43 yieldingly against the cam. As the cam 31 rotates, the ring 36 slides back and forth, guided by the pins 37 and 38 and the push rod 42, by which rod the valve stem 24 is reciprocated to open and close the port controlled thereby.

Certain embodiments of this invention have been shown and described. Obviously, however, other forms can be created which will fall within the scope of this invention and it is intended to cover all such constructions in the following claims.

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

1. In a hydrocarbon motor, in combination, cylinders arranged in V-form, a casing arranged between said cylinders and supported independently thereof, horizontally arranged valves in the cylinders, and valve operating mechanism in said casing.

2. In a hydrocarbon motor, in combination, cylinders arranged in V-form, a casing arranged between said cylinders and supported independently thereof, horizontally

arranged valves in the cylinders having their stems extending in proximity to said casing, and valve operating mechanism in said casing and having parts extending therethrough to operate said valves.

3. In a hydrocarbon motor, in combination, cylinders arranged in V-form, a casing arranged between said cylinders, a cam shaft in said casing, parallel shafts arranged side by side in said casing, rocker arms on one of said parallel shafts adapted to operate valves in the cylinders farthest therefrom, and rocker arms on the other parallel shafts adapted to operate valves in the other cylinders.

4. In a hydrocarbon motor, in combination, cylinders arranged in V-form, horizontally arranged valves in said cylinders, horizontally arranged push-rods for said valves, rocker arms for said push rods arranged in staggered relation, and a single cam shaft to operate said rocker arms.

5. In a hydrocarbon motor, in combination, cylinders arranged in V-form, horizontally arranged valves in said cylinders, horizontally arranged push-rods for said valves, rocker arms for said push-rods arranged in staggered relation, parallel supports for said arms, and a single cam shaft arranged beneath said supports and adapted to operate all of said arms.

6. In a hydrocarbon motor, in combination, motor cylinders, valves therein, a cam shaft, a pair of shafts mounted above and parallel to said cam shaft, rocker arms on said parallel shafts in operative relation with the cam shaft, and push-rods extending from said arms to the valves.

7. In a hydrocarbon motor, in combination, cylinders arranged in V-form, a casing formed separately from the cylinders and arranged between the cylinders, said casing being supported independently of the cylinders, horizontally arranged valves in the cylinders, and valve operating mechanism in the casing.

8. In a hydrocarbon motor, in combination, a crank case, cylinders arranged in V-form and mounted on the crank case, a casing formed independently of the crank case and cylinders, and arranged between the cylinders, said casing being supported on the crank case independently of the cylinders, valves in the cylinders, and valve operating mechanism in said casing.

In testimony whereof I affix my signature.

JESSE G. VINCENT.