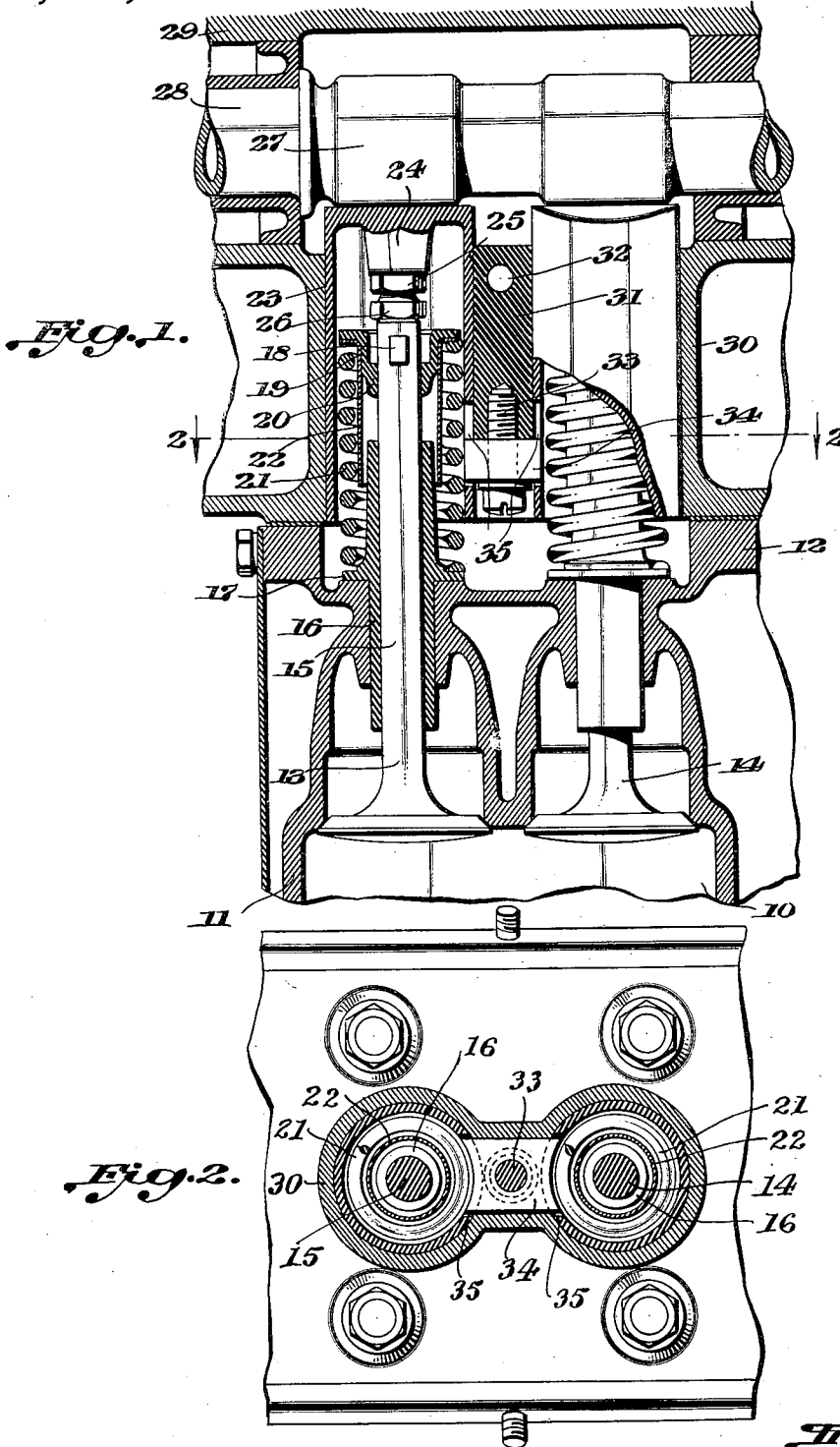


H. D. CHURCH.
HYDROCARBON MOTOR.
APPLICATION FILED JUNE 6, 1919.

1,374,059.

Patented Apr. 5, 1921.



Inventor,
Harold D. Church,
By *Willon Tibbels*, Atty.

UNITED STATES PATENT OFFICE.

HAROLD D. CHURCH, OF DETROIT, MICHIGAN, ASSIGNOR TO PACKARD MOTOR CAR COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF MICHIGAN.

HYDROCARBON-MOTOR.

1,374,059.

Specification of Letters Patent.

Patented Apr. 5, 1921.

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To all whom it may concern:

Be it known that I, HAROLD D. CHURCH, 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 valve mechanisms therefor.

One object of the invention is to provide a construction permitting in overhead valves of the use of a heavy key for retaining the valve operating sleeve which is actuated by the cam.

Another object of the invention is to provide a construction permitting of the use of a single key for a pair of valve operating sleeves.

Another object of the invention is to provide a construction in which the key shall be rigidly secured within the casing.

With these objects and others in view, the invention is embodied in preferable form in the construction and arrangement hereinafter described and illustrated in the accompanying drawings, in which—

Figure 1 is a vertical section of part of the casing of an overhead valve mechanism, and

Fig. 2, a horizontal section on the line 2—2 of Fig. 1.

Referring to the drawings, 10 indicates a cylinder of a hydrocarbon motor having a body portion 11 and a head 12 within which the valves are mounted. The valves are indicated at 13 and 14 and one of said valves may control the inlet and the other the exhaust. Each valve is provided with a stem 15 mounted to slide in a guide 16 having a flange 17 resting upon a ledge of the head 12. Near its upper end the valve stem is provided with a key 18 projecting into a cap 19, a ledge 20 of which is adapted to bear against the key to lift the valve stem and hold the valve to its seat. Pressure is imparted to the cap to effect this seating movement of the valve by means of a spring 21, which surrounds the valve stem. A thimble 22 is interposed between the springs and valve stem to guide the former and prevent contact thereof with the valve stem.

Surrounding the spring is a sleeve 23, which constitutes a push rod or valve open-

ing member and which is open at its lower end and is adapted to reciprocate into and from the chamber in the upper part of the cylinder head 12. The upper end of the sleeve is closed and is provided on its under surface with a contact head or stem 24, having a threaded lower end adapted to receive a lock nut 25 and an abutment nut 26, which is spaced from but adapted to contact with the upper end of the valve stem in order to open the valve. The sleeve is adapted to be actuated by a cam 27, carried by the cam shaft 28 which is mounted within a removable cam shaft casing 29. The valve operating sleeves are mounted to slide in a casing 30. Mounted in this casing between the adjoining push rod sleeves of a pair of valves is a solid partition wall 31, which may be removably held to the casing by a pin, bolt or other suitable means passing through a hole 32 therein. Secured to the lower end of the partition wall 31 by means of a bolt 33 is a key 34, which is adapted to project into elongated vertical slots 35 formed in the walls of adjacent push rod sleeves 23 of the respective valves 13 and 14. This construction permits a very strong and heavy key to be employed for the two sleeves and one which has sufficient body to enable it to be rigidly secured by a bolt at the base of the relatively thick partition wall 31, thereby obtaining a secure mounting for the key. The large key thus enabled to be employed also offers substantial resistance to the wear due to the reciprocating movement of the sleeves against the same. The key and other parts of the valve mechanism are inserted by forming the casing or head with a cut-away part, inserting the cam shaft, the valves and stem, and then inserting the key through the cut-away side wall of the casing, and securing the same by a screw bolt.

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

1. In a hydrocarbon motor, in combination with a valve, a cam and its shaft, a push rod member between the cam and valve, a removable partition wall adjacent said member and a key secured to the bottom of said wall and engaging said member.

2. In a hydrocarbon motor, in combination with a pair of adjacent valves, push

rod sleeves for operating said valves, and a key located between and engaging both of said sleeves.

5 3. In a hydrocarbon motor, in combination with a pair of adjacent valves, cams and cam shaft, valve operating sleeves for said valves, a partition wall between said sleeves and a key secured to said wall and engaging both sleeves.

4. In a hydrocarbon motor, in combination with a pair of adjacent valves, cams and a cam shaft, hollow sleeves actuated by said cams for operating said valves, a removable partition wall between said sleeves and a key secured to said wall and engaging 15 said sleeves.

In testimony whereof I affix my signature.
HAROLD D. CHURCH.