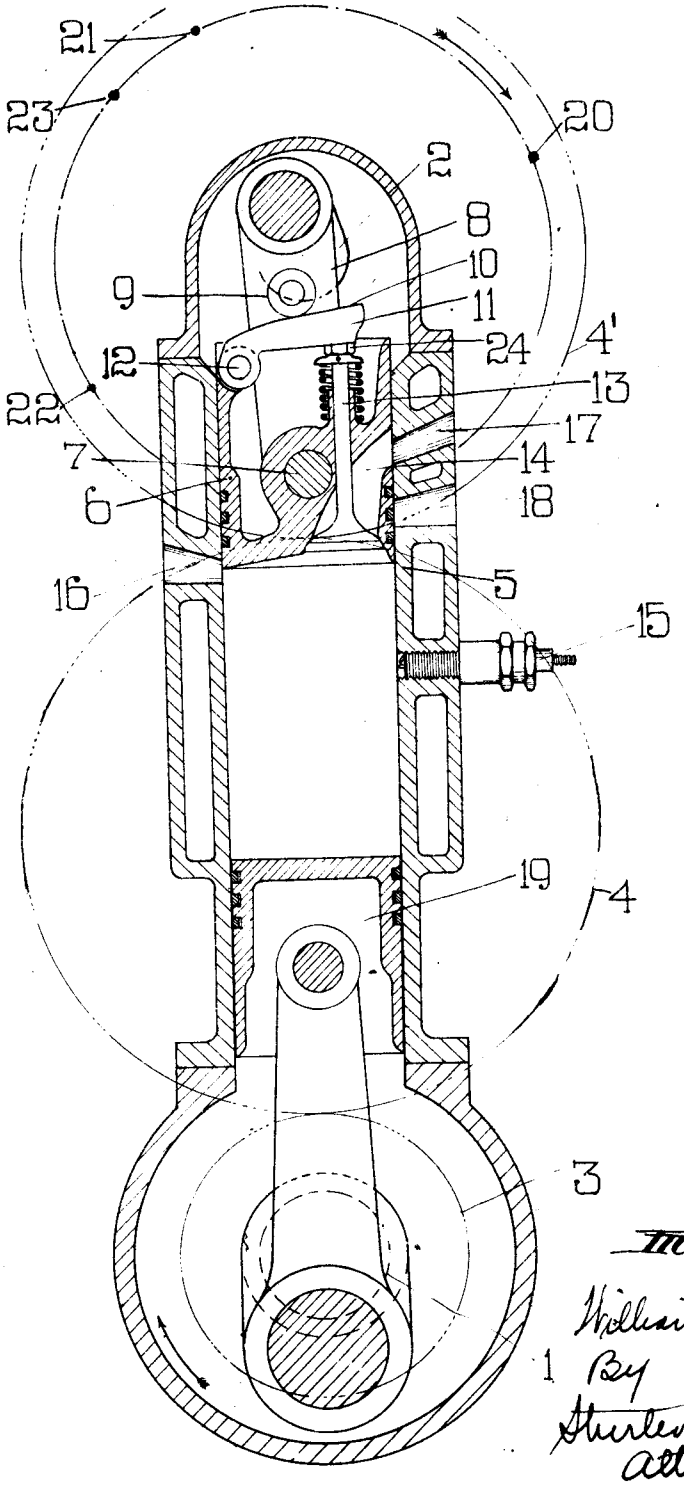
Dec. 30, 1924. 1,521,077

W. H. CLEGG

INTERNAL COMBUSTION ENGINE

Filed June 11, 1923



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UNITED STATES PATENT OFFICE.

WILLIAM HENRY CLEGG, OF WEST KIRBY, ENGLAND.

INTERNAL-COMBUSTION ENGINE.

Application filed June 11, 1923. Serial No. 644,696.

To all whom it may concern:

Be it known that I, WILLIAM HENRY CLEGG, a subject of the King of Great Britain, residing in West Kirby, in the county of Chester and Kingdom of England, have invented certain new and useful Improvements in Internal-Combustion Engines, of which the following is a specification.

The present invention relates to an improved internal combustion engine.

An object of the present invention is to provide an engine which will run silently and give a greater efficiency by utilizing more fully expansion of the gases after explosion.

The invention is more particularly described with reference to the accompanying drawing showing in cross-sectional elevation one form of construction by way of example.

In this engine, the crank shaft 1 drives a counter-crank shaft 2 half its own speed of revolution through gearing 3, 4, and 4^a. The top of the working cylinder 5 is closed by a piston head 6, the gudgeon pin 7 of which is connected by means of a connecting rod 8 to a crank pin on the crank shaft 2. This connecting rod 8 has a roller abutment 9 cooperating with a cam surface 10 on a tappet lever 11 pivoted at 12 at the top end of the piston head 6, and having an adjustable abutment 24 engaging the end of a valve 13 adapted to control a passage-way 14 in the piston head 6.

The working cylinder 5 is provided with the usual sparking plug 15 with an exhaust passage 16 which can be coupled to the usual exhaust pipe and silencer, a passage 17 which can be connected to a pure air supply in a passage 18 which is preferably connected to a carburetter for the supply of carburetted mixture.

The engine can be air or water cooled as desired.

The drawing shows the working piston 19 at the end of the explosion stroke in which the exhaust port 16 is almost fully opened and the air inlet valve 13 is about to be opened by the pressure of the roller abutment 9 and the tappet lever 11. This valve 13 is arranged to open when the exhaust gases passing through the passage 16 have attained substantially their highest velocity, so that air can pass down through the passage 17 and assist in the scavenging of the cylinder, the passage-way 17 being connected to a source of air under pressure, for instance, an air supply obtained by a fan driven from the shafts 1 or 2.

The working piston 19 will then ascend whilst the piston head 6 moves towards it. The combustion chamber will, in the meantime, be fed with air due to the injector action between the exhaust port 16 and air inlet port 17 in spite of the fact that the two pistons are approaching one another. As the piston head 6 moves further inward the passage 14 will register with the passage 18 connected to the carburetter through which an explosive mixture, such as gasolene vapour will enter. As the piston head moves towards its extreme position the port 18 will be covered and then the valve 13 will automatically close.

A suitable timing of the engine is indicated, by way of example, in which the ordinary induction stroke commences at the point 20, the firing stroke at the point diametrically opposite, that is to say 180 degrees away from the point 21. Whilst the firing takes place at about the point 22, an exhaust valve opens at the point 23.

When the ports have reached the angular position indicated at 21, that is to say, when the top crank 2 is substantially at 20 degrees from its top center, then the bottom crank shaft 1 will preferably be at the outer dead centre, this being the relative position at the completion of the power stroke.

I declare that what I claim is:—

1. An internal combustion engine comprising a cylinder having ports at its upper end, a working piston, a movable piston head in said upper end, a valve controlling a passage, in the said piston head, means to reciprocate said piston head to control a port in the cylinder by a peripheral edge on it and means to automatically operate the valve in said piston head to control the passage way leading to a second port on the cylinder wall uncovered by said piston head.

2. An internal combustion engine comprising a cylinder having three ports at its upper end, a working piston therein, a movable piston head at said upper end, a valve controlling a passage in said piston head communicating at certain times with one of said ports, means to reciprocate said piston head to control two upper ports in the cylinder by a peripheral edge on it, and means to automatically operate the valve in said piston head to control a passage way leading

to the first named port on the cylinder wall uncovered by the piston head.

3. An internal combustion engine comprising a cylinder having ports at its upper end, a working piston, a movable piston head in said upper end, a valve controlling a passage, in the said piston head, a crank to reciprocate said piston head to control a port in the cylinder by a peripheral edge on it and a pin on said crank to operate the valve as it swings in an arc of a circle with the crank to control the passage way leading to a second port on the cylinder wall uncovered by said piston head.

In witness whereof, I have hereunto signed my name this 28th day of May 1923, in the presence of two subscribing witnesses.

WILLIAM HENRY CLEGG.

Witnesses:

JOHN MCLACHLAN,

CAROLINE ALICE COEE.