

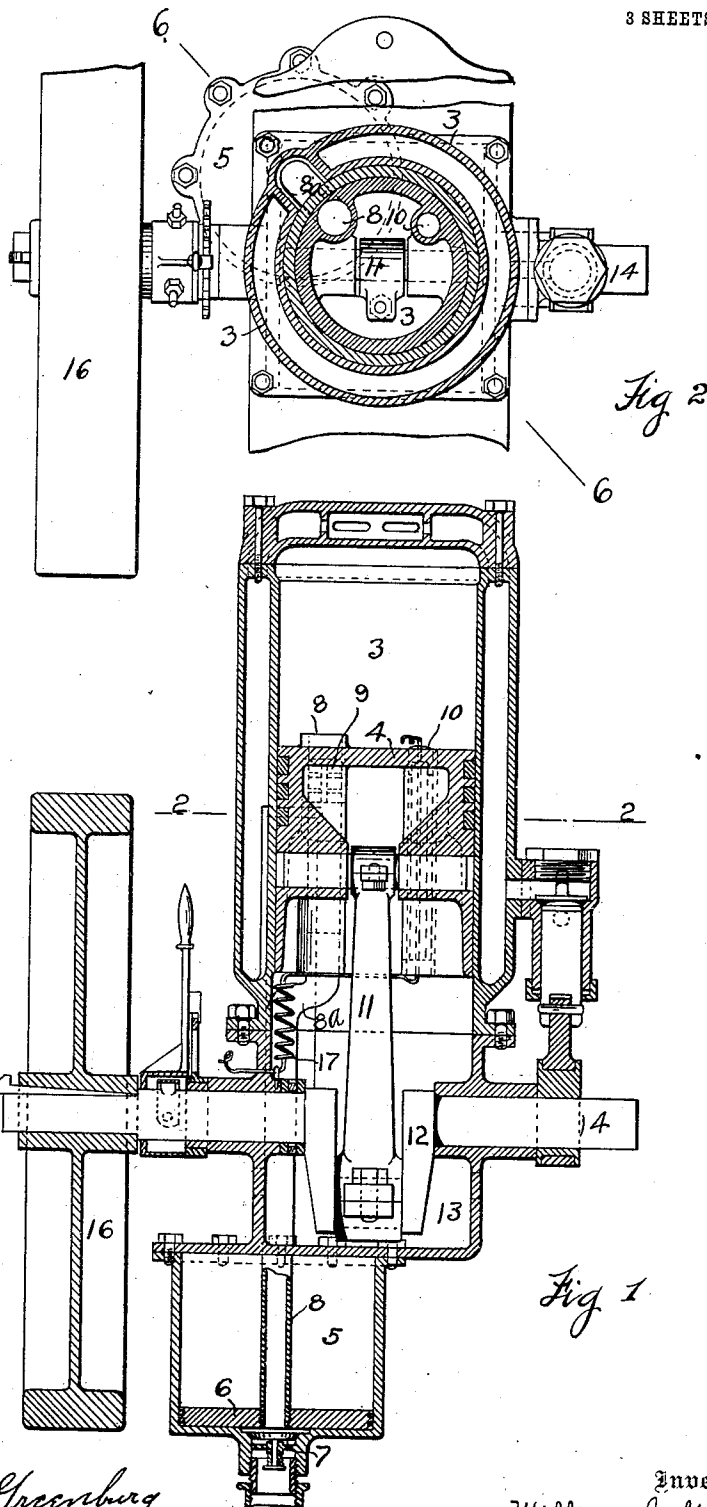
No. 890,272.

PATENTED JUNE 9, 1908.

W. J. GRIFFITH.
GAS ENGINE.

APPLICATION FILED JUNE 3, 1907.

3 SHEETS—SHEET 1.



Witnesses:
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Clarence E. Ray

By

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Parker & Burton.

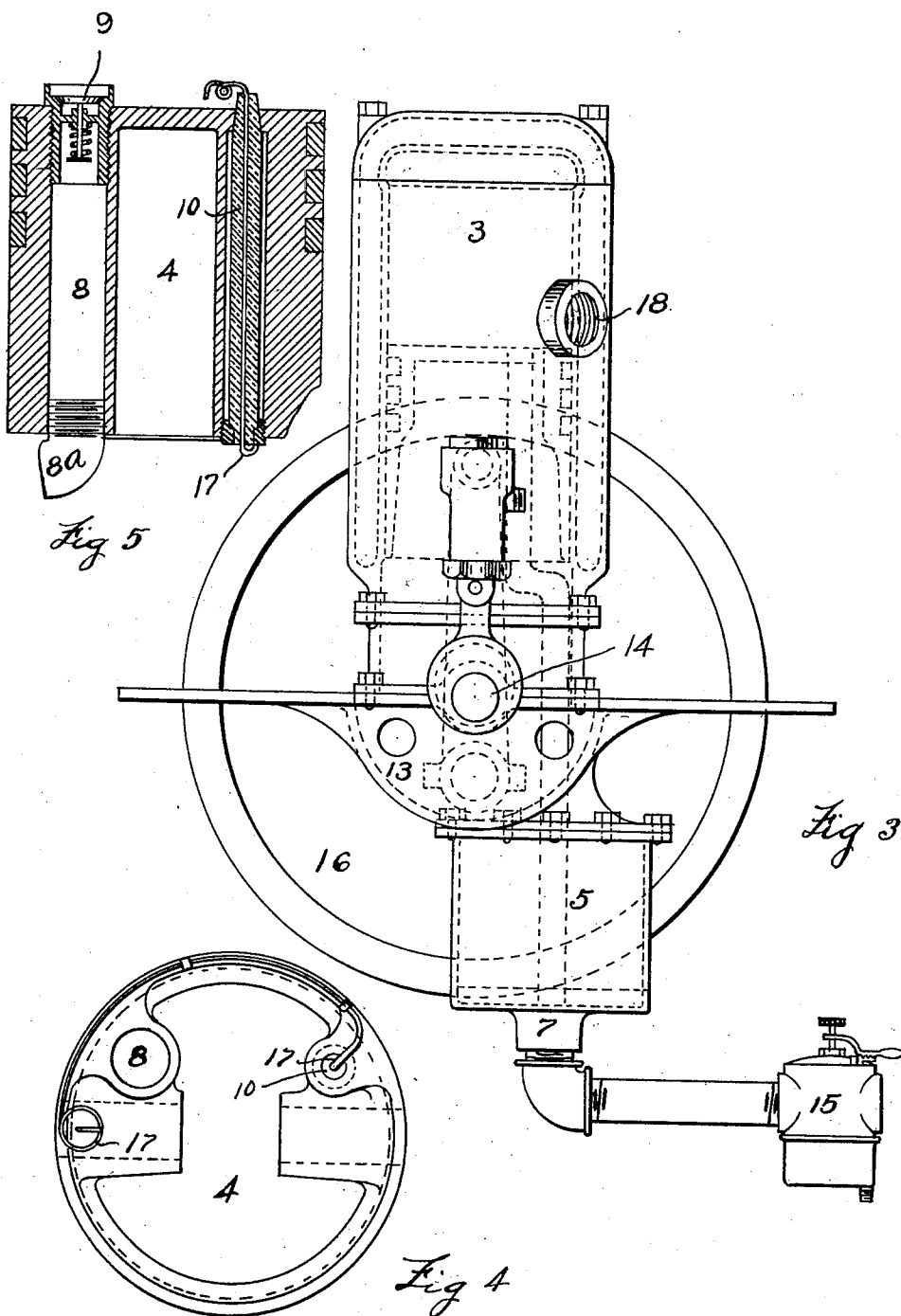
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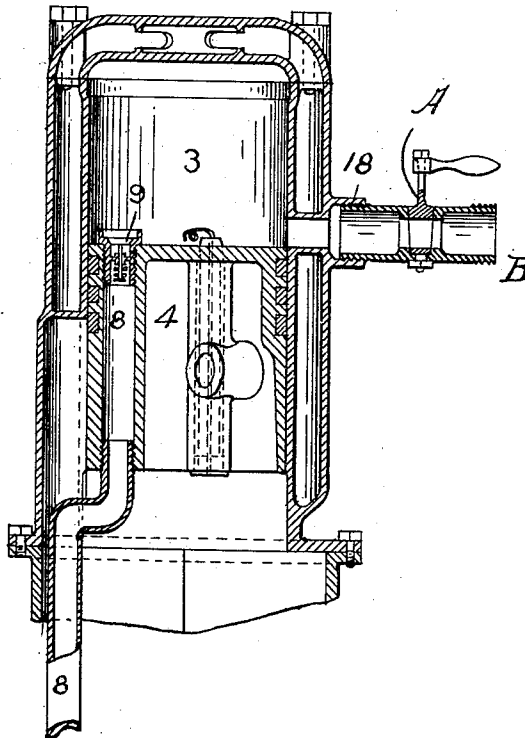


Fig. 6

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UNITED STATES PATENT OFFICE.

WILLIAM J. GRIFFITH, OF FLINT, MICHIGAN.

GAS-ENGINE.

No. 890,272.

Specification of Letters Patent.

Patented June 9, 1908.

Application filed June 3, 1907. Serial No. 376,936.

To all whom it may concern:

Be it known that I, WILLIAM J. GRIFFITH, a citizen of the United States, residing at Flint, county of Genesee, State of Michigan, have invented a certain new and useful Improvement in Gas-Engines, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to gas engines, and the object of my improvements is to provide an improved gas engine employing the two cycle mode of operation.

In the accompanying drawings:—Figure 1, is a sectional elevation of an engine embodying my invention. Fig. 2, is a plan view in section, the section being taken on the line 2—2 Fig. 1. Fig. 3, is an elevation of the entire engine with carbureter attached. The exhaust pipe is omitted. Fig. 4, is a plan view of the piston. Fig. 5, is a vertical diametral section of the piston. Fig. 6, is a section on the line 6—6 Fig. 2, showing the exhaust pipe and a cock therein.

3 is the cylinder, and 4 is the piston reciprocating therein.

14 is the crank shaft, 12 the crank, 11 the connecting rod, 13 the crank case, and 16 the fly wheel upon the shaft 14.

5 is a cylinder located below the crank case 13, and 6 is a piston reciprocating therein.

8, 8, is a hollow piston rod secured to the piston 6 extending upward adjacent to the wall of the crank case, then bending inward as indicated at 8^a, and then extending upward and communicating with a passage through the piston 4, to which piston it, said connecting rod, is also rigidly secured.

7 is an intake valve to the cylinder 5.

9 is a puppet valve controlling the opening from the bore of the piston rod 8 to the cylinder 3 above the piston 4.

10 is a sparking plug secured in the piston 4, the point being located at the top of, and near the surface of, said piston. The wire from the sparking plug 10 passes partly around the lower face of the piston 4, to which it is secured; it is then wound into a helix 17, and then passes out through the wall of the crank case.

15, Fig. 3, is the carbureter connected by a pipe to the intake 7 to the cylinder 5.

18 is the exhaust passage.

B is the exhaust pipe, and A a cock in said pipe by which the exhaust passage may be opened and closed.

The operation of the above described engine is as follows:—When the piston 4 rises, it carries with it the piston 6, drawing an explosive mixture into the cylinder 5. When the piston 4 returns downward, the mixture is compressed in the cylinder 5 below the piston 6, and is forced through the hollow rod 8 into the space above the piston 4. Upon the up-stroke of the piston 4, the mixture above it is compressed, and the mixture is lighted at the upper end of the stroke by a spark from the wire of the plug 10. The piston then descends under the impulse of the explosion and exhausts in the usual way through the passage 18. The mixture which has now been compressed below the piston 6; lifts the valve 9 and flows into the space in the cylinder 3 above the piston 4, displacing the rest of the products of combustion. The just described operation is then again repeated. The coil or helix 17 allows the piston 4 to reciprocate without disconnecting the wire to the plug 10. I believe that I secure advantages and more power by igniting the mixture adjacent to the piston as shown.

It will be observed that by this arrangement the necessity of compression in the crank case is avoided, and as much or as little mixture may be compressed as is desired.

To reverse the engine, I manipulate the cock A so as to close the exhaust passage. The engine is now checked by the work of accumulating compressed air in the cylinder 3 above the piston 4, and by shifting the lighting mechanism so that the spark shall take place on the up-stroke the engine may be reversed.

There is always an explosive mixture in the cylinder 3, so that the engine may be started by a spark.

What I claim is:—

1. The combination of a power cylinder, a power piston therein, a pump cylinder and pump piston therein, a hollow piston rod common to said pistons and communicating with the interior of both the said cylinders, and means for controlling the passage through said piston rod, for the purpose described.

2. In a two-cycle gas engine, the combination of a power cylinder, a power piston therein, a pump cylinder, a pump piston therein, a hollow piston rod common to both

of said pistons and opening through said pistons, a puppet valve located on the power piston to control the opening from said piston rod, an exhaust apparatus adapted to relieve
5 the pressure of explosion at the end of the power stroke, substantially as and for the purpose described.

3. In a two cycle gas engine having a piston therein, a pump cylinder located below
10 said engine, a piston in said cylinder having a hollow piston rod extending therefrom and adjacent to a wall of said gas engine, said piston having the off-set 8° therein and extending through and secured to the piston of
15 the gas engine, for the purpose described.

4. In a two cycle gas engine having a cylinder and a piston therein, a pump cylinder having a piston therein, means for connecting said pistons together, a passage extending between said cylinders through the means 20 for connecting said pistons together, and means for controlling said passage, for the purpose described.

In testimony whereof, I sign this specification in the presence of two witnesses.

WILLIAM J. GRIFFITH.

Witnesses:

ALICE TOWNSEND,
ELLIOTT J. STODDARD.