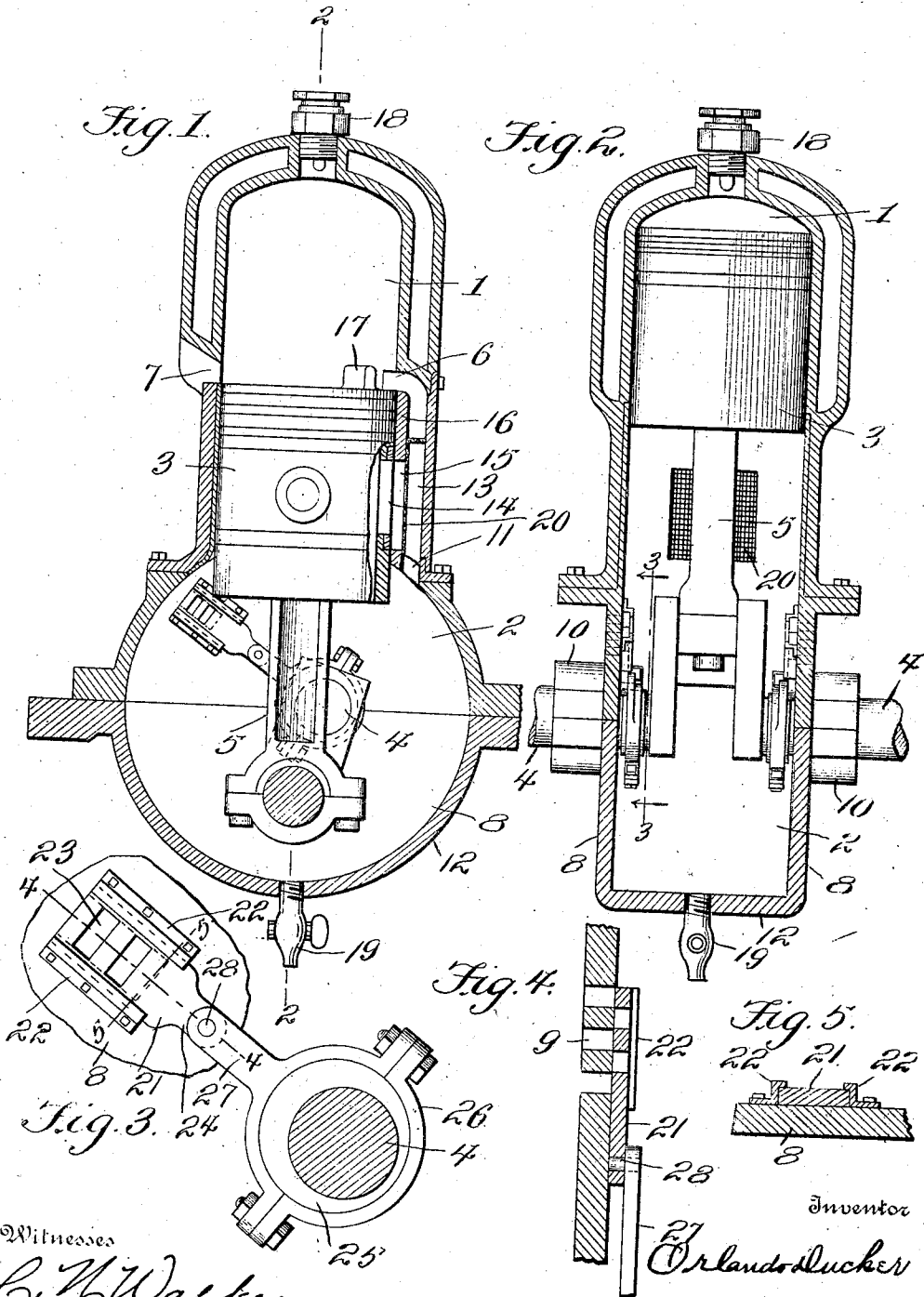


O. DUCKER.
GAS ENGINE VALVE.
APPLICATION FILED JAN. 15, 1910.

1,010,353.

Patented Nov. 28, 1911.



Witnesses
C. H. Walker.
J. A. Eckhoff.

Inventor
Orlando Ducker
By John F. Byrne.
Attorney

UNITED STATES PATENT OFFICE.

ORLANDO DUCKER, OF WASHINGTON, DISTRICT OF COLUMBIA.

GAS-ENGINE VALVE.

1,010,353.

Specification of Letters Patent. Patented Nov. 28, 1911.

Application filed January 15, 1910. Serial No. 538,232.

To all whom it may concern:

Be it known that I, ORLANDO DUCKER, a citizen of the United States, residing at Washington, in the District of Columbia, have invented new and useful Improvements in Gas-Engine Valves, of which the following is a specification.

This invention relates to improvements in gas engines of that type disclosed in my co-pending application, filed October 1, 1909, and serially numbered 520546.

The object of the present invention is the provision of a simple, durable and efficient valve adapted to control the admission of explosive mixture to the compression chamber of the engine.

The invention consists in the construction, combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawing, wherein:—

Figure 1 is a sectional view taken on a plane extending vertically and centrally through an engine equipped with my improved valve. Fig. 2 is a sectional view taken on the vertical plane indicated by the line 2—2 of Fig. 1, parts of the engine being shown in elevation. Fig. 3 is a sectional view taken on the vertical plane indicated by the line 3—3 of Fig. 2, looking in the direction indicated by the arrow. Fig. 4 is a sectional view taken on the plane indicated by the line 4—4 of Fig. 3, and Fig. 5 is a sectional view taken on the plane indicated by the line 5—5 of Fig. 3.

Referring to the drawing by reference numerals, 1 designates the explosive cylinder, 2 the compression chamber, 3 the piston head, 4 the crank shaft, and 5 the piston rod of a gas engine of the two cycle type. The explosive chamber is provided with an inlet port 6 and an exhaust port 7 arranged diametrically opposite each other. In its side walls 8, the compression chamber 2 is provided with inlet ports 9 located in the same horizontal plane above the bearings 10 of the crank shaft 4. An outlet port 11, which is located in the end wall 12 of the compression chamber 2, communicates with the inlet port 6 of the explosive cylinder 1 through a passage 13. The piston head 3 is hollow and has its under side fully open. The side wall of the piston head 3 is provided with elongated openings 14 which when the piston head 3 is at the limit of its down stroke are in full registration with

similar openings 15 formed in the side wall 16 of the passage 13. During its up stroke the piston head 3 draws a charge of explosive mixture into the compression chamber 2 through the intake ports 9, and during its down stroke it compresses the charge of explosive mixture in the chamber. When the piston head 3 reaches the limit of its down stroke, the openings 14 are in full registration with the openings 15 and the inlet port 6 and exhaust port 7 of the explosive cylinder are uncovered, whereupon the explosive mixture rushes into the explosive cylinder 1 through port 11, openings 14 and 15, passage 13, and port 6. The spent gases in the explosive cylinder 2 pass out through the exhaust port 7. To direct the explosive mixture upwardly into the explosive cylinder 1, a baffle plate 17 is mounted upon the upper end of the piston head 3. A spark plug 18 is mounted in the upper end of the explosive cylinder 1. A pet cock 19 permits the removal of any water which may accumulate in the compression chamber 2. A screen 20 which extends across the passage 13 and over the openings 15, prevents "fire backs" from the explosive cylinder 1 to the compression chamber 2.

The intake ports 9 each preferably comprise a plurality of elongated openings. The intake ports 9 are adapted to be simultaneously opened and closed by reciprocating valves 20 which are mounted in guide strips 22. The guide strips 22 are secured to the inner sides of the walls 8 of the compression chamber 2. Preferably each valve 21 consists of a flat rectangular body which is provided with a plurality of elongated openings 23 adapted to be moved into and out of registration with the openings of the intake ports 9, and which is provided at one end with an extension 24. The valves 21 are adapted to be operated by and during the rotation of the crank shaft 4, and they are connected to the crank shaft by eccentrics 25 fixed upon the crank shaft and by straps 26 mounted upon the eccentrics and having their arms 27 pivotally connected to the extensions 24 by pins 28.

The connection between the valves 21 and the crank shaft 4 is such that the intake ports 9 are opened during the up strokes of the piston 3 and closed during the down strokes thereof, whereby to permit the piston to draw a charge of explosive mixture into the compression chamber 2 during each

up stroke and to compress a charge of explosive mixture during each down stroke.

While I have described the method of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof, I desire to have it understood that the apparatus shown is merely illustrative and that such changes may be made when desired as are within the scope of the appended claim.

Having thus described the invention, what I claim as new is:—

In a gas engine, the combination with an explosive cylinder, a compression chamber communicating with said cylinder and having a plurality of intake ports in one wall thereof, a piston head, a crank shaft, and a piston rod connected to said head and

shaft, of guide strips secured to the inner side of said wall, one of said strips being located on each side of said ports, a valve plate mounted in said guides and bearing against the inner side of said wall, said valve plate being provided with a plurality of openings, an extension on one end of said plate, an eccentric secured to said shaft, an eccentric strap mounted upon the eccentric, and an extension on said strap pivotally connected to the valve plate extension.

In testimony whereof I have hereunto set my hand in presence of two subscribing witnesses.

ORLANDO DUCKER.

Witnesses:

PERCY H. RUSSELL,
FRED LAKE.