W. BOYD.

INTERNAL COMBUSTION ENGINE.

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1,229,216. Patented June 12, 1917.

Fig. 1.

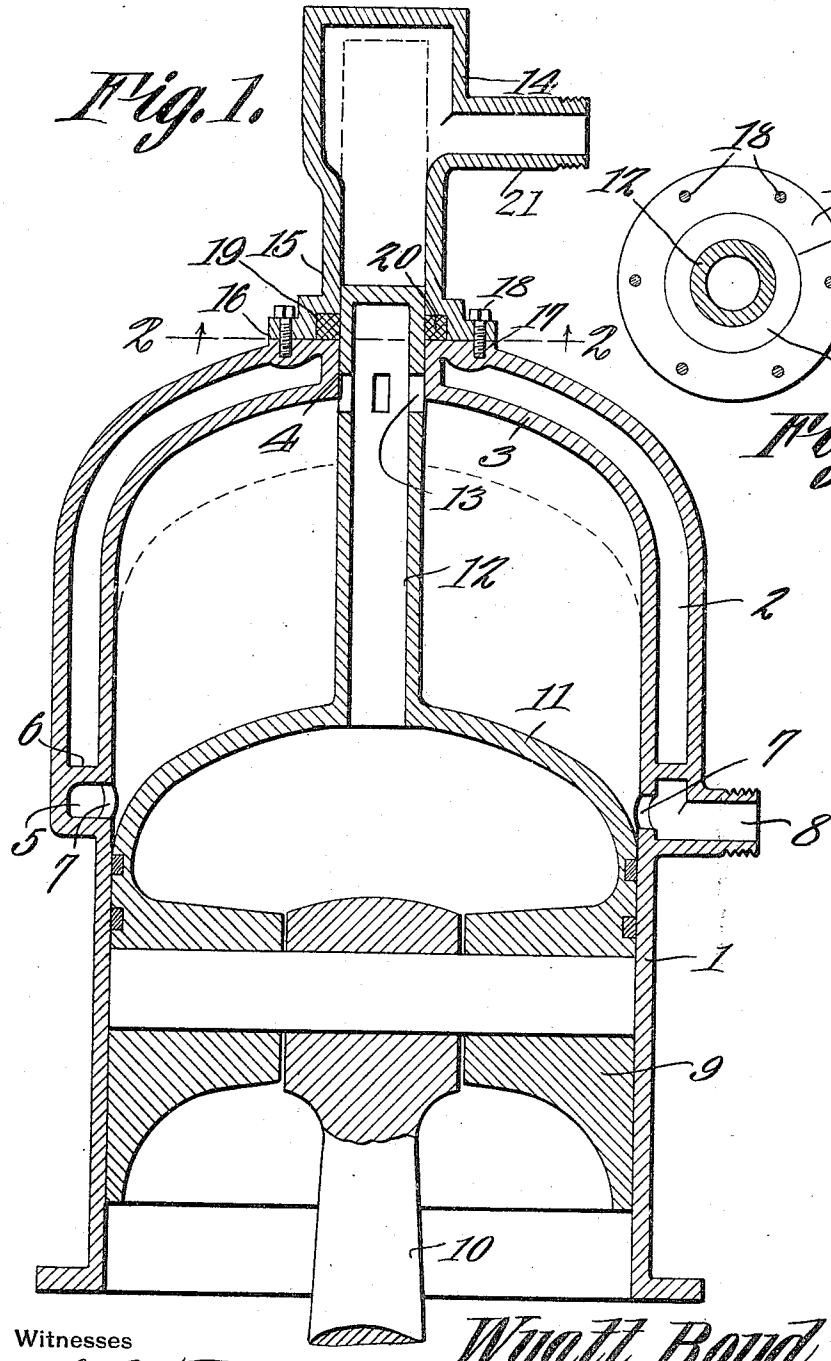


Fig. 2.

Witnesses

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WYATT BOYD, OF CANTON, OHIO.

INTERNAL-COMBUSTION ENGINE.

1,229,216. Specification of Letters Patent. Patented June 12, 1917.

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To all whom it may concern:

Be it known that I, WYATT BOYD, a citizen of the United States, residing at Canton, in the county of Stark and State of Ohio, have invented a new and useful Internal-Combustion Engine, of which the following is a specification.

The present invention appertains to internal combustion engines, and aims to provide a two-cycle engine of novel and improved construction, and one which is devoid of valves and valve gears.

It is also within the scope of the invention to provide a two-cycle engine embodying a unique assemblage of the component parts and which is comparatively simple in construction, as well as being practical and efficient in operation.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

The invention is illustrated in the accompanying drawing, wherein—

Figure 1 is a longitudinal section of the improved structure.

Fig. 2 is a cross section thereof taken on the line 2—2 of Fig. 1.

In the drawings, the numeral 1 designates the engine cylinder, which is bolted or otherwise secured to a closed crank case in the manner of an ordinary two-cycle engine. The cylinder 1 is provided at its head end with a water jacket 2, and the said head end of the cylinder is dome-shaped, as at 3, and is provided with a central opening 4.

The cylinder 1 is also provided between its ends with an annular exhaust chamber 5 at the lower end of the water jacket 2, there being an annular partition 6 between the water jacket and exhaust chamber, and the walls of the cylinder 1 having openings or apertures 7 for establishing communication between the interior of the cylinder and the exhaust chamber 5. The exhaust chamber 5 is provided with a nipple 8 for the attachment of the exhaust pipe if one is employed, the nipple 8 providing an outlet for the exhaust chamber.

The piston 9 which reciprocates within the cylinder 1 is provided with a dome-shaped head or end 11 which is adapted to move relatively close to the dome-shaped end 3 of the cylinder, the connecting rod 10 being connected to the piston 9 in the ordinary manner. The dome-shaped end 11 of the piston is provided with an integral upwardly or outwardly projecting tubular extension 12 sliding through the opening 5 of the cylinder. The tubular extension 12 is disposed axially within the cylinder and projects out through the opening 4, the outer end of the extension 12 being closed, and the extension being provided at one side and adjacent its outer end, with longitudinal slots 13 providing inlets for the extension.

An upstanding inlet chamber 14 having its upper end closed and its lower end open, is carried by the upper or outer end of the cylinder, the chamber 14 having its lower end contracted to form a neck 15 through which the extension 12 is slidable snugly, and the neck 15 is provided with an outturned flange 16 resting upon an abutment 17 formed upon the outer end of the cylinder around the opening 4. The flange 16 is secured to the abutment 17 by means of bolts or other securing means 18 engaged through the flange and taking into the abutment, and the lower end of the chamber 14 is provided with an annular rabbet 19 surrounding the opening 4 and in which a packing ring 20 is disposed, so that the packing ring 20 will be clamped tightly between the rabbet 19 and the abutment 17 so as to embrace the extension 12 and prevent leakage. The chamber 14 is provided with a lateral inlet nipple 21 for the attachment of an intake manifold or conduit leading from the carbureter. The chamber 14 is of a greater diameter than the extension 12, whereby when the extension is raised or moved outwardly within the chamber 14, an annular space will be provided between the walls of the chamber and extension.

The parts are so arranged, that when the piston 11 is at the end of its inward or downward stroke, as illustrated in Fig. 1, the exhaust openings or ports 7 are uncovered, and the inner end of the slots 13 are just moved within the upper end of the cylinder, as illustrated in the said figure.

In operation, assuming the parts to be arranged as illustrated in Fig. 1, the piston 9 in moving outward or upward will immediately close the ports 7, and the extension

12 being moved outward will move the slots 13 out of the cylinder, for enabling the charge within the cylinder to be compressed during the completion of the upward stroke of the piston. At the same time, the extension 12 being outward into the chamber 14, will bring the slots 13 within the said chamber 14, and as a result the gaseous fuel may flow from within the chamber 14 through the slots 13 and into the extension 12, and thence through the piston 11 into the crank case (not shown). After the compression stroke is completed, the charge is ignited by means of a spark plug (not shown), or other suitable igniter, which will force the piston 11 inward through the power stroke. During the inward or power stroke of the piston, the gaseous fuel within the crank case will be compressed by the inward movement of the piston, and when the piston 11 reaches the end of its inward or power stroke, the exhaust ports 7 will be uncovered by the piston, to allow the exhaust to escape, and at the same time the extension 12 being held inwardly with the piston, will bring the inner end of the slots 13 within the cylinder. This enables the compressed fuel below the piston to pass upwardly through the extension 12 and out through the slots 13 into the cylinder, to assist in ejecting the burnt gases, and to introduce the new charge into the cylinder. Then when the piston is moved outward, it will compress the new charge and the operation will be repeated.

The present engine is therefore of the two-cycle type, and is devoid of valves and valve gears, to render the structure as simple and inexpensive as possible, and without jeopardizing the utility or efficiency of the engine. The other advantages and attributes of the invention are thought to be obvious, without further comment being necessary.

What is claimed is:

In a device of the character described, the combination of a cylinder having an opening at one end and a flat annular abutment surrounding said opening, a tubular member slidable snugly through said opening, an outstanding chamber having a reduced open end snugly receiving said tubular member and provided with an outturned flange resting upon said abutment, said reduced end having an annular rabbet surrounding said opening, securing elements engaged through said flange and taking into the abutment, and a packing ring disposed tightly between said abutment and rabbet and embracing said tubular member, the end of said tubular member being closed, said tubular member having an opening near its end movable past said packing ring into the cylinder and into said chamber beyond the reduced open end thereof.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

WYATT BOYD.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."