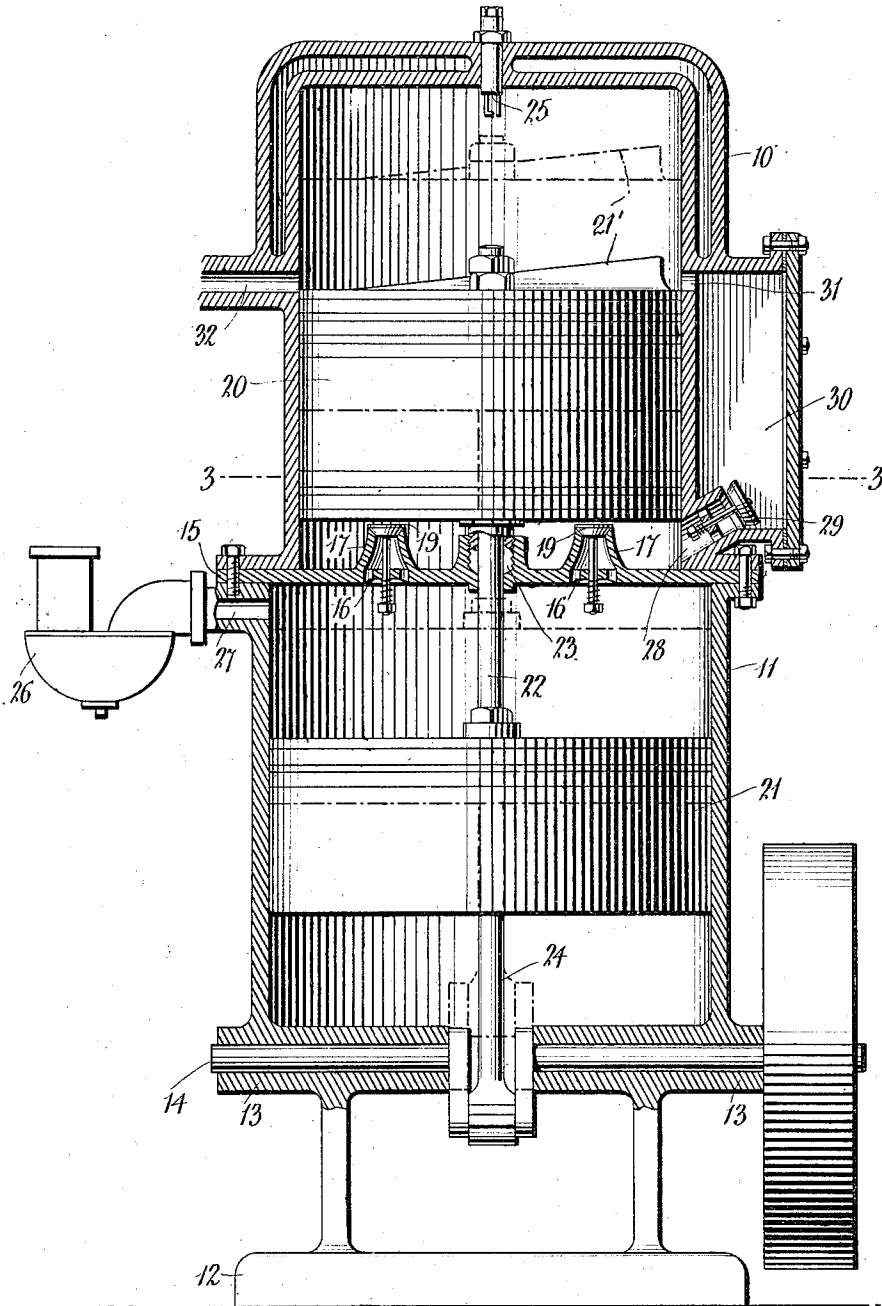


O. C. STEGLAT.
INTERNAL COMBUSTION ENGINE.
APPLICATION FILED SEPT. 17, 1910.

1,001,782.

Patented Aug. 29, 1911.



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INTERNAL-COMBUSTION ENGINE.

1,001,782.

Specification of Letters Patent. Patented Aug. 29, 1911.

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To all whom it may concern:

Be it known that I, OTTO C. STEGLAT, a citizen of the United States, residing at Detroit, in the county of Wayne, State of Michigan, have invented certain new and useful Improvements in Internal-Combustion Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to internal combustion engines and has special reference to an engine of the two cycle type.

The principal object of the invention is to provide an improved and simplified general construction for an engine of this class.

A second object of the invention is to provide an engine of this class having an improved construction of compression and explosion cylinders; the engine being so constructed that the compression of the explosive mixture takes place in two stages.

A third object of my invention is to provide a construction of two cycle engine wherein "back firing" will be eliminated.

A fourth object of my invention is to provide an engine of this description which will give an increased power over other engines of the same cylinder dimensions.

With the above and other objects in view the invention consists in general of a pair of alined cylinders combined with certain novel valve and piston arrangements.

The invention further consists in general of certain novel details of construction and combinations of parts hereinafter fully described, illustrated in the accompanying drawings, and specifically set forth in the claims.

In the drawing the figure represents a vertical section through an engine constructed in accordance with this invention.

In the present embodiment of the invention there is employed an explosion cylinder 10, which is shown as vertically arranged and beneath which is a compression cylinder 11. These cylinders are supported on a suitable base 12 carried on which are bearings 13 for a crank shaft 14.

Between the cylinders 10 and 11 is a diaphragm 15 which is so arranged as to constitute a head common to both cylinders, the diaphragm being the bottom head of the explosion cylinder and top head of the compression cylinder.

The two cylinders are secured to the diaphragm by means of suitable bolts in the ordinary manner and the cylinder 11 is of greater diameter than the cylinder 10. The diaphragm 15 is provided with a plurality of openings 16 above which are valve casings 17 provided with suitable seats and these openings are controlled by valves 19 which are so arranged as to open upwardly in the direction of the explosion cylinder.

In the cylinder 10 is a piston 20 and in the cylinder 11 is a similar piston 21. The piston 20 is provided with the usual baffle plate 21' as is common in two cycle gas engines. A piston rod 22 passes through a stuffing box 23 in the diaphragm 15 and serves to connect the two pistons so that they are held to move in unison. A connecting rod 24 is used to connect the lower piston 21 with the crank shaft 14. Explosion takes place in the upper end of the cylinder 10 and for the purpose of igniting the mixture the usual spark plug 25 is provided the connections of which are not shown as forming no specific part of this invention.

At 26 is a carbureter which communicates by the inlet pipe 27 with the cylinder 11 immediately beneath the diaphragm 15. This carbureter is provided with the usual check valve arrangement common to such devices and which is arranged to prevent movement of air through the carbureter in one direction while permitting its free movement in the opposite direction. Immediately above the diaphragm 15 the cylinder 10 is provided with a port 28 which is controlled by a check valve 29 which opens away from the cylinder. This check valve and port afford communication with a by-pass the other end of which communicates with the cylinder 10 intermediate its ends, the communicating port being shown at 31. Directly opposite the port 31 there is provided an exhaust pipe 32 also communicating with the cylinder 10. The openings from the exhaust pipe and the by-pass are so arranged that they are only uncovered when the piston 20 reaches the lowermost point of its stroke.

In the operation of this device the downward movement of the piston 21 draws air through the carbureter thus carburizing the same. This action continues until the piston 21 has reached the lowermost point of its stroke. As the piston 21 moves upward the carburized air in the cylinder 11 is

forced out of said cylinder through the openings 16 in the diaphragm, the valves 19 rising to permit the passage of the carburized air into the cylinder 10 below the piston 20. Since the cylinder 11 is of greater diameter than the cylinder 10 the air which is forced through the openings 16 will be compressed to a certain degree during the upward movement of the pistons. When the pistons again begin to move downward the valves 19 will close and the carburized air beneath the piston 20 will be forced into the by-pass 30 through the lower opening 28, the valve 29 opening to permit such action when the piston 20 has reached the lowermost point of its stroke the compressed mixture will be forced through the by-pass into the cylinder 10 above the piston 20 and will force out before it the spent gases remaining in the cylinder 10 from the last explosion. Meanwhile a fresh charge of carburized air has been drawn into the cylinder 11. As the pistons again rise the lower piston acts as previously described and the piston 20 completes the compression of the carburized air in the upper end of the cylinder 10 until the spark passes through the igniter 25. The explosion then takes place and forces the pistons downward, the entire operation being repeated with each complete revolution of the crank shaft and consequent complete reciprocation of the piston.

There has thus been provided a simple and efficient device of the kind described and for the purpose specified.

Having thus described the invention what is claimed as new is:—

1. In an internal combustion engine, an explosion cylinder, a compression cylinder in axial alinement with said explosion cylinder, a diaphragm between said cylinders and forming a head common to both cylinders, said diaphragm being provided with an

opening therein, a check valve controlling said opening and arranged to open toward the explosion cylinder, pistons reciprocable in unison in said cylinders, an inlet pipe communicating with the compression cylinder adjacent said diaphragm, a by-pass leading from the end of the explosion cylinder adjacent said diaphragm to a point between the ends of the explosion cylinder, and a check valve in said by-pass opening away from the end adjacent the diaphragm.

2. In an internal combustion engine, an explosion cylinder, a compression cylinder in axial alinement with said explosion cylinder and of greater diameter than said explosion cylinder, a diaphragm between said cylinders and forming a head common to both cylinders, said diaphragm being provided with an opening therein, a check valve controlling said opening and arranged to open toward the explosion cylinder, a piston in said explosion cylinder, a second piston in the compression cylinder, a piston rod connecting said pistons, an inlet pipe communicating with the compression cylinder adjacent said diaphragm, a by-pass leading from the end of the explosion cylinder adjacent said diaphragm to a point intermediate the ends of the explosion cylinder, a check valve in said by-pass opening away from the end adjacent the diaphragm, and an exhaust pipe communicating with said explosion cylinder at a point opposite the end of the by-pass remote from said diaphragm, the piston in the explosion cylinder controlling the oppositely disposed by-pass and exhaust pipe openings.

In testimony whereof, I affix my signature, in presence of two witnesses.

OTTO C. STEGLITZ.

Witnesses:

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ALEX. HAYES.