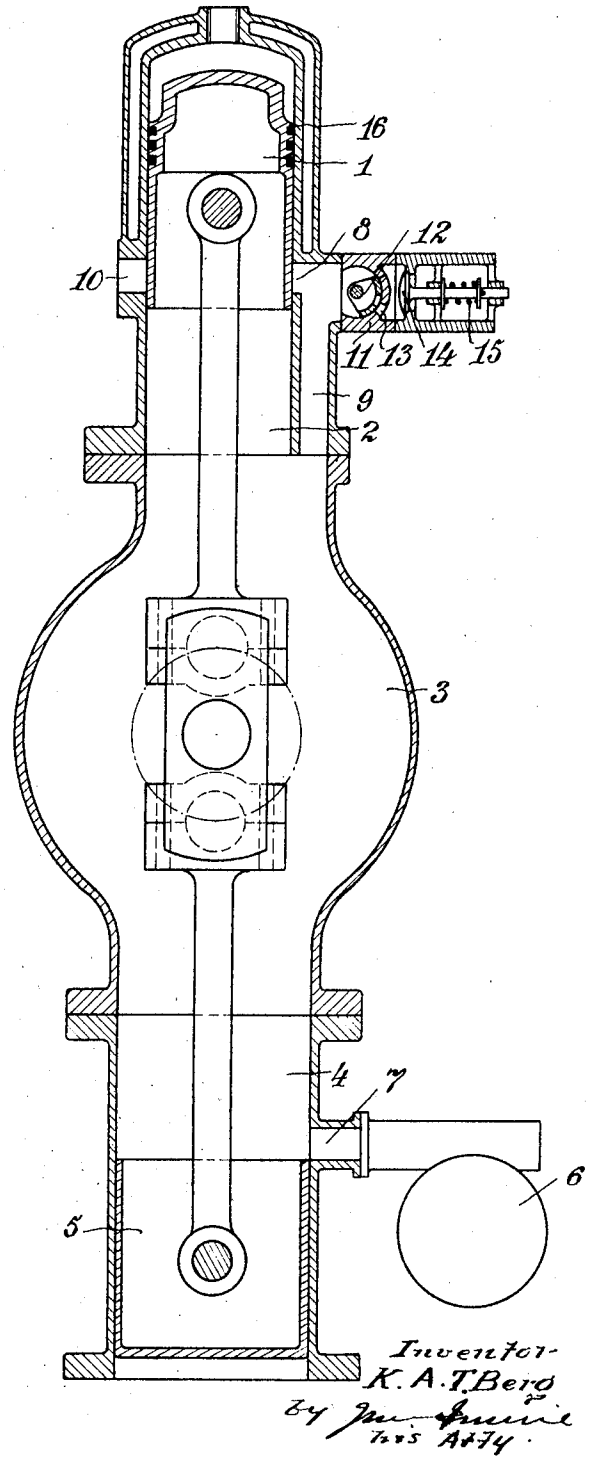
K. A. T. BERG.

TWO-STROKE INTERNAL COMBUSTION ENGINE.

APPLICATION FILED AUG. 28, 1919.

1,350,135. Patented Aug. 17, 1920.



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UNITED STATES PATENT OFFICE.

KARL ASSAR THEODOR BERG, OF HÖGANÄS, SWEDEN.

TWO-STROKE INTERNAL-COMBUSTION ENGINE.

1,350,135. Specification of Letters Patent. Patented Aug. 17, 1920.

Application filed August 28, 1919. Serial No. 320,423.

To all whom it may concern:

Be it known that I, KARL ASSAR THEODOR BERG, a citizen of Sweden, residing at Höganäs, Sweden, have invented certain new and useful Improvements in Two-Stroke Internal-Combustion Engines, of which the following is a specification.

The present invention relates to two stroke internal combustion engines directly connected with air compressors, which engines are driven by fuel that is gasified outside of the motor in carbureters, and consist in arranging a separate air inlet close to the motor cylinder and the carbureter proper close to the air cylinder in such a way that the motor cylinder after the working period being finished firstly is scavenged by pure or almost pure air, whereafter the explosive mixture is pressed into the cylinder for the next working period. Hereby a better utilization of the fuel is obtained and thus the working of the motor becomes cheaper.

The invention is illustrated in the accompanying drawing which shows a combined motor of the kind referred to in a longitudinal section. 3 indicates the crank case with the common crank shaft, 2 is the motor cylinder, 1 the motor piston, 4 the air cylinder, 5 the air cylinder piston, 6 the carbureter, 7 the inlet for the explosive mixture from the carbureter, 8 the inlet to the motor cylinder, 9 the passage leading from the crank case to the inlet 8, 10 the exhaust opening, 11 the controlling chamber for the air inlet, 12 the inlet valve of the latter, 13 the regulating passages in the chamber 11, of which passages two are shown, though one or more than two also may be used. 14 indicates the air valve and 15 the spring acting upon the same.

The mode of operation is as follows:—

In the position shown in the drawing the piston 1 is driven toward its inner dead center and also the piston 5 on account of its connection with the common crank shaft, *i. e.* both pistons move toward each other. The air present in the crank case and the gas mixture are hereby compressed, and when the piston 1 with its edge 16 opens the passages 10 and 8 the gases now consumed will escape through the opening 10, said gases being partially acted upon by the air and the explosive mixture pressed in through the passages 9 and 8. When the pistons move from the inner to the outer dead centers pure air is drawn in through the valve 14, the passages 13 passing the inlet valve 12 and the passage 9 to the crank case 3. When the inner edge of the piston 5 passes the passage 7 the explosive mixture is drawn in from the carbureter 6 on account of the vacuum generated in the crank case and not equalized by the air coming from the passage 9.

By the arrangement of the inlet of the air and of the explosive mixture according to the present invention, the former close to the motor cylinder and the latter as far as possible from the same, it follows that the combustion gases when expelled from the cylinder do not directly come into contact with the fresh explosive mixture as in the usual two stroke combustion engines, but only with practically pure air, so that the combustion of the fresh fuel cannot take place too early, thus avoiding the usual losses caused hereby.

The scavenging becomes particularly effective by this arrangement, as it is performed by a volume corresponding to the total volume of both pistons 1 and 5 in such a way that no combustion gases from the preceding working stroke can remain in the motor cylinder. It is no disadvantage that the scavenging volume is too great, as the surplus accompanying the combustion gases into the open air consists of the practically pure air first pressed in. This surplus of scavenging air is also followed by the advantage that hereby also a portion of the surplus of heat of the motor cylinder is removed, so that the quantity of cooling water is reduced compared with usual motors.

In order to be able to control the quantity of air drawn in in proper relation to the mixture of gas supplied by the carbureter the chamber 11 is provided with a valve 12 of any desired shape and having a suitable number of passages and edges, whereby the vacuum required in the crank case for introducing the explosive mixture from the carbureter may be varied also during the running of the motor.

The air valve 14 is shown cylindrical, but it may have any other suitable form.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A two-stroke internal combustion engine having a cylinder and pump casing and a closed crank case serving as a compression chamber intermediate the cylinder and pump

casing, said engine being formed with a passage leading from the compression chamber and opening into the cylinder, a valve controlled air inlet opening into said compression chamber through said passage, and a gas inlet opening into the pump chamber.

2. A two-stroke internal combustion engine having a cylinder and pump casing and a closed crank case serving as a compression chamber intermediate the cylinder and pump casing, said engine being formed with a passage leading from the compression chamber and opening into the cylinder, a valve controlled air inlet opening into said compression chamber through said passage, and a gas inlet opening into the pump chamber, a piston in said pump casing to cut off the gas inlet in a predetermined position of the parts, and a piston in said cylinder for controlling the admission of air to the cylinder from the compression chamber.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

KARL ASSAR THEODOR BERG.

Witnesses:

GUNHILD PETERSSON,

H. KRAUGEN.