No. 656,020. Patented Aug. 14, 1900.

C. HAUTIER.

GAS ENGINE.

(Application filed Nov. 9, 1899.)

(No Model.)

FIG. 1

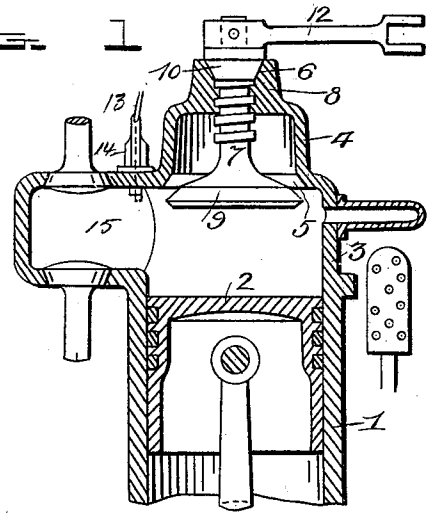
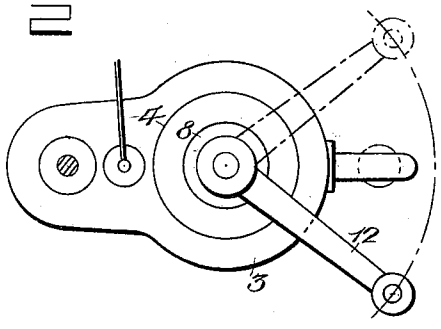


FIG. 2



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UNITED STATES PATENT OFFICE.

CAMILLE HAUTIER, OF PARIS, FRANCE.

GAS-ENGINE.

SPECIFICATION forming part of Letters Patent No. 656,020, dated August 14, 1900.

Application filed November 9, 1899. Serial No. 736,307. (No model.)

To all whom it may concern:

Be it known that I, CAMILLE HAUTIER, a citizen of the United States, residing at Paris, France, have invented certain new and useful Improvements in Gas-Engines; and I do 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.

My invention relates to improvements in explosive-gas engines, and more particularly to the construction of the explosion-chamber; and the object is to provide a means for increasing or diminishing the area of the explosion-chamber and providing a relief-outlet therefor whereby the starting of the motor will be facilitated by increasing the capacity of the explosion-chamber, thus reducing the force of the explosion and at the same time permitting a certain portion of pressure due to the exploding gases to escape into the atmosphere and after the motor is in motion to reduce the capacity of the explosion-chamber and at the same time confine the entire force of the pressure due to the explosion to the piston, it of course being understood that the charge of explosive mixture which is admitted to the explosion-chamber is constant at all times.

The invention consists in the construction and novel combination of the parts of the gas-engine, as will be hereinafter more fully described, and particularly pointed out in the claim.

In the accompanying drawings the same reference characters indicate the same parts of the invention.

Figure 1 is a longitudinal section of one end of a gas-engine, showing my improved explosion-chamber. Fig. 2 is a top plan view of the same.

1 denotes the upper end of the cylinder; 2, the piston; 3, the main explosion-chamber, and 4 the auxiliary chamber, which is formed with a valve-seat 5, opening into the explosion-chamber, and with a smaller valve-seat 6, opening into the atmosphere.

7 denotes a valve-stem which has a threaded engagement with the neck 8 of the auxiliary explosion-chamber, and its lower end terminates in a conical-faced valve 9, which is adapted to close against the seat 5 and cut off communication between the main and the auxiliary explosion-chambers. This threaded valve-stem also carries an outwardly-opening valve 10, which is adapted to close against the seat 6, and on the projecting end of said stem is mounted a crank-arm 12, by means of which the stem and valves are simultaneously operated. It may be here stated that the threaded valve-stem fits loosely in the neck 8, so that when the valve 9 is unseated there is an escape of gas between the stem and the neck into the atmosphere.

An ordinary force-pump or similar appliance may be employed to force a mixture of air and gaseous or vaporized fuel through a tube 13 and an inlet 14 into the auxiliary chamber 15, communicating with the main explosion-chamber 3.

In starting the engine it is desirable that the piston 2 be set at or near the beginning of its working stroke prior to the introduction into the cylinder of the explosive mixture in order to produce considerable driving power when pressure is produced in the cylinder by the introduction of the explosive mixture.

When the engine is being started, the fly-wheel is turned by hand, as is customary in this class of engines, which causes the charge to be drawn into the main explosion-chamber 3, wherein the charge is compressed by the back stroke of the piston. Before turning the fly-wheel, as above stated, the lever 12 is turned in the direction that will cause it to turn the threaded valve-stem 7 to raise both the valve 9 and the valve 10, positions that will leave spaces between said valves and their respective valve-seats whereby to reduce the force of the explosion in the chamber by permitting a certain portion of the pressure due to the exploding gases to escape or pass the said valves 9 and 10 into the atmosphere, the valve 10 being entirely closed when it is desired to confine the entire charge of gas after the engine is in full operation.

Having thus fully described my invention, what I claim as new and useful, and desire to secure by Letters Patent of the United States, is—

In an explosive-gas engine, the combination with the main explosion-chamber; and the auxiliary explosion-chamber formed with the valve-seats 5 and 6; of the valve-stem having

a threaded engagement with the neck of said auxiliary explosion-chamber; the valves 9 and 10, the former at the inner, and the latter at the outer, end of said threaded valve-stem; and the crank-arm 12 for operating said valve-stem from the outside of said auxiliary explosive-chamber, substantially as described.

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

CAMILLE HAUTIER.

Witnesses:
I. ALLISON BOWEN,
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