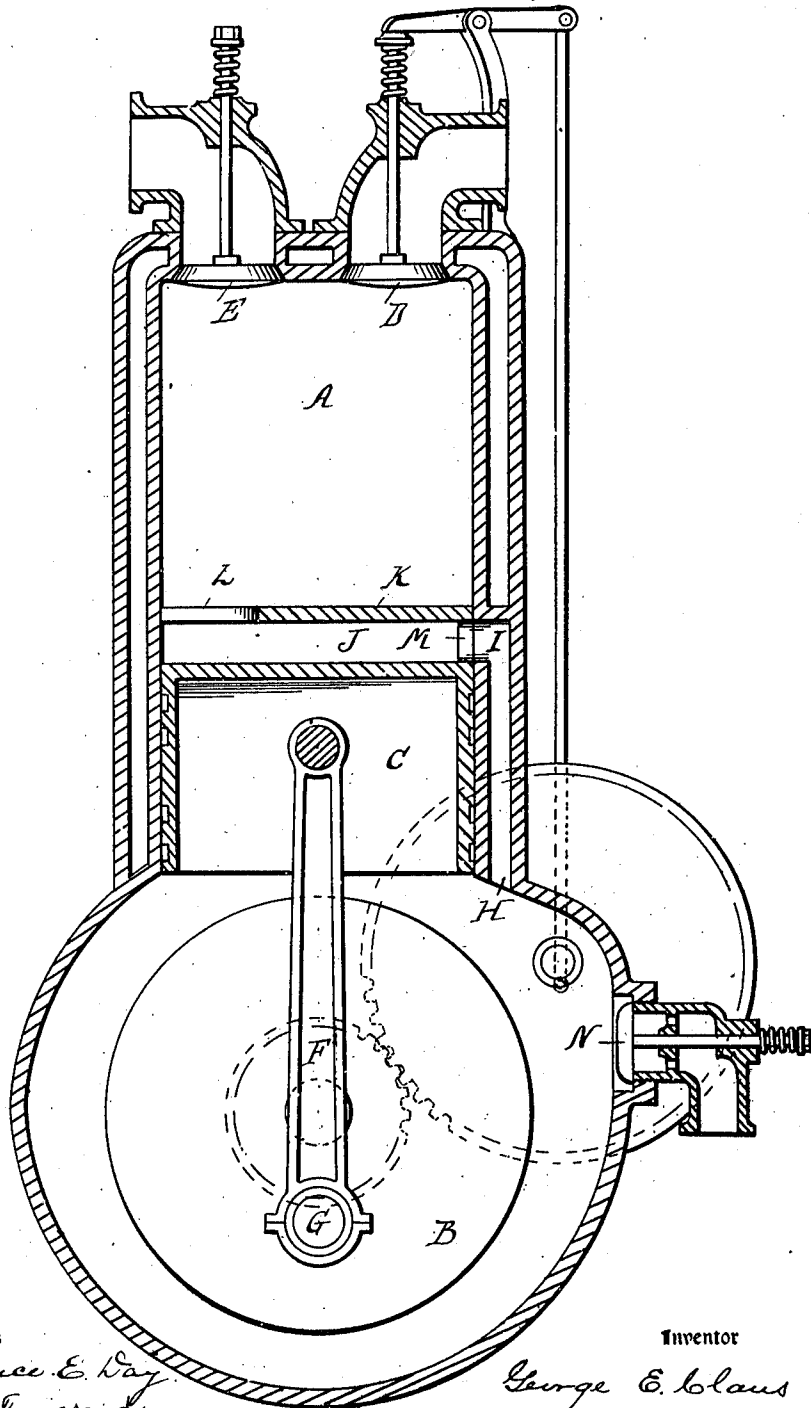


G. E. CLAUS.
GAS ENGINE.
APPLICATION FILED MAY 11, 1908.

1,031,246.

Patented July 2, 1912.



Witnesses
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UNITED STATES PATENT OFFICE.

GEORGE E. CLAUS, OF DETROIT, MICHIGAN.

GAS-ENGINE.

1,031,246.

Specification of Letters Patent.

Patented July 2, 1912.

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To all whom it may concern:

Be it known that I, GEORGE E. CLAUS, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Gas-Engines, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to gas engines.

Two objects of my improvements are to provide an improved gas engine in which the shock generally incident to the explosion is largely obviated, and the heat more effectively converted into available energy. I accomplish these objects in the device illustrated in the accompanying drawings, in which the figure is a sectional elevation of a four cycle engine embodying my invention.

A, is the cylinder, and B the crank case.

C is the piston adapted to reciprocate in the cylinder A.

D is the exhaust, and E the inlet valve.

F, is a connecting rod joining the crank G and piston C.

H is a passage through which air is forced into the cylinder A, above the piston.

I, is the port leading from the passage H to the cylinder A.

J, is a pocket or chamber formed in the piston C.

N is a non-return valve controlling the entrance into the crank case.

A plate K constitutes a deflector located at right angles to the axis of the cylinder partially covers the chamber J in the piston leaving an opening L from said chamber into the cylinder above the piston, and an opening M adapted to register with the port I at the lower end of the stroke of the piston.

The operation of the valves E and D is the same as in the ordinary four cycle engine. When the piston C rises, it sucks in atmospheric air past the valve N, and when the piston descends it compresses such air in the crank case B, and when the opening M registers with the port I, the compressed air in the crank case B is discharged through the passage H, port I, opening M, chamber J, and passage or opening L, into the cylinder A above the piston C; thus the

chamber J is filled with air and the cylinder above the piston with an explosive mixture. When the piston C rises it compresses the explosive mixture above the piston C, and when this is fired the pressure rises suddenly and is cushioned by the resiliency of the air in the chamber J, so that the shock of the explosion is diminished, and a quick expansion of the ignited charge permitted, thus diminishing the dissociating effect, and more effectively storing the energy of the explosion to be given out as the piston is forced downward.

It will be observed that there are two separate sources of supply to the cylinder. Instead of having one supply a combustible mixture and the other an incombustible gas, I may use a readily inflammable mixture supplied through one channel and a less inflammable mixture through the other. For example, air and gasoline vapor may be taken in through E and air and kerosene through N. In such case the more inflammable and quicker acting mixture may be first ignited and the flame may be communicated to the second mixture through the burning of the first.

Referring to the figure, it will be noticed that there is an intake from the crank chamber discharging the products of combustion and filling the cylinder with air, or combustible mixture if a combustible mixture is drawn through the valve N instead of pure air, then there is an intake through the valve E of a combustible mixture, then there is an intake again from the crank case raising the pressure in the combustion chamber, the valve L being closed at the said second uncovering of the port I.

What I claim is:

1. An internal combustion engine of the four-cycle type, having in combination, a cylinder provided with an exhaust port and an inlet port, a closed crank-case connected therewith and provided with a controlled inlet port which is uncovered when the piston travels outward from the crank case into the cylinder, a by-pass leading from the crank case and opening into the cylinder below the lowermost boundary of the combustion chamber, a piston having a chamber in its head provided with two ports, one leading into the cylinder and the other adapted to register with the by-pass opening when the piston is near the limit of its outward stroke, a conduit for furnishing a fuel

charge at the inlet port of the cylinder, means for uncovering said port only during the suction stroke, and means for uncovering the exhaust port only at a period during the scavenging stroke, the said contents of the crank-case being compressed by the outward travel of the piston and entering the piston chamber when the piston port registers with the by-pass at the limit of its outward travel, whereby a second fluid for cushioning and for combustion is introduced into the cylinder substantially as described.

2. An internal combustion engine of the four-cycle type, having in combination, a cylinder provided with an exhaust port and an inlet port, a closed crank-case connected therewith and provided with a controlled inlet port which is uncovered when the piston travels outward from the crank case into the cylinder, a by-pass leading from the crank case and opening into the cylinder below the lowermost boundary of the combustion chamber, a piston having a spacious chamber in its head provided with two ports, one leading into the cylinder and the

other adapted to register with the by-pass opening when the piston is near the limit of its outward stroke, the said ports being spaced at opposite extremes of the piston chamber, the latter thereby being adapted to act as a storage or retarding chamber, a conduit for furnishing a fuel charge at the inlet port of the cylinder, means for uncovering the said inlet port only on the suction stroke, and means for uncovering the exhaust port only at a period during the scavenging stroke, said contents of the crank case being compressed by the outward travel of the piston and entering the piston chamber, when the piston port registers with the by-pass at the limit of its outward stroke, being there slightly retarded by said arrangement of said chamber before entrance into the cylinder, substantially as described.

In testimony whereof, I sign this specification in the presence of two witnesses.

GEORGE E. CLAUS.

Witnesses:

ELLIOTT J. STODDARD,
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