

P. B. O'CONNELL.
GAS ENGINE.
APPLICATION FILED FEB. 2, 1911.

1,008,191.

Patented Nov. 7, 1911.

FIG. 1.

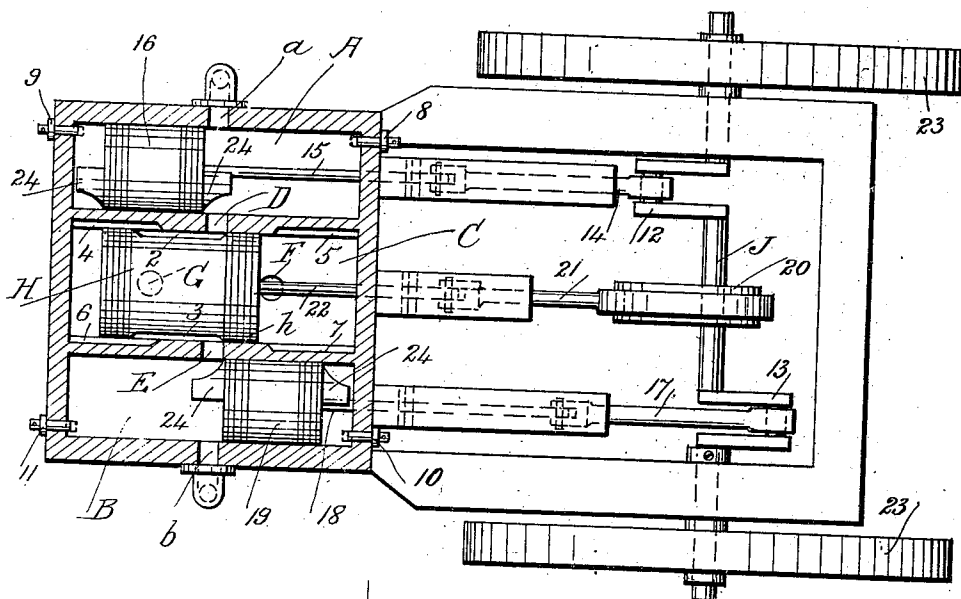


FIG. 2.

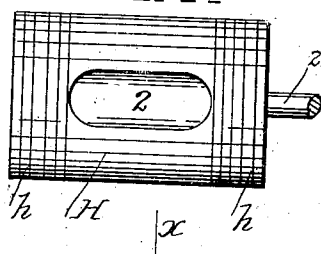
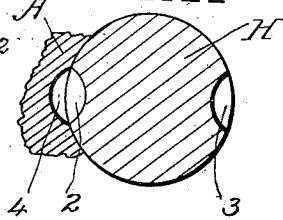


FIG. 3.



Witnesses

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GAS-ENGINE.

1,008,191.

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To all whom it may concern:

Be it known that I, PATRICK B. O'CONNELL, a citizen of the United States, residing at Magarth, in the Province of Alberta, Canada, have invented certain new and useful Improvements in Gas-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 gas engines provided with two power cylinders arranged for ignition at each end; and it consists in the novel construction and combination of the parts hereinafter fully described and claimed.

In the drawings, Figure 1 is a plan view of a gas engine constructed according to this invention and showing the cylinders in section. Fig. 2 is a detail side view of the charging piston. Fig. 3 is a cross-section through the charging piston, taken on the line $x-x$ in Fig. 2, and showing also one of the cylinder channels.

A and B are two power cylinders, and C is a charging cylinder arranged between the two power cylinders. The cylinder A has an exhaust port a on one side at about the middle of its length, and the cylinder B has a similar exhaust port b on the other side of it.

D is an inlet port connecting the cylinder A with the charging cylinder C, and E is an inlet port connecting the cylinder B with the charging cylinder C. Both ports D and E are arranged at the middle parts of the cylinders.

F and G are two supply ports for gas or other fuel and air which open into the charging cylinder C and which are arranged at its end portions at certain distances on each side of its middle part so that they may be uncovered alternately by the charging piston H. This charging piston slides back and forth in the cylinder C and is provided with packing-rings h of approved make at its end portions.

2 and 3 are longitudinal channels in the sides of the piston H between its packing-rings.

4, 5, 6, and 7, are longitudinal channels in the sides of the cylinder C. The channels 4 and 5 work in connection with the channel 2 and port D, and are arranged one on each side of the port D and at a little distance

from it. The channels 6 and 7 are arranged in a similar manner on the other side of the cylinder C from the channels 4 and 5, and work in connection with the channel 3 and port E.

8 and 9 are the igniters at the ends of the cylinder A, and 10 and 11 are the igniters at the ends of the cylinder B. Any approved form of igniter may be used in carrying out this invention.

J is the engine crankshaft provided with cranks 12 and 13 on opposite sides of its center.

14 is a connecting-rod, and 15 is a piston-rod which connect the piston 16 of cylinder A with the crank 12.

17 is a connecting-rod, and 18 is a piston-rod which connect the piston 19 of cylinder B with the crank 13.

20 is an eccentric at the middle part of the crankshaft. This eccentric is of less throw than the cranks, and a small crank might be used as its equivalent. The center of this eccentric is arranged in line with one of the said cranks.

21 is an eccentric-rod, and 22 is a piston-rod which connect the charging piston H with the eccentric 20. All the piston-rods have stuffing-boxes, and cross-heads and guides, of approved construction, and 23 are the fly-wheels secured on the crankshaft.

24 are baffle-plates on the ends of the power pistons to prevent the charges from passing from the inlet ports to the exhaust ports in direct lines.

When the parts are in the positions shown in Fig. 1, a charge of inflammable fluid has been drawn into or forced into the front end of the charging cylinder through its supply port F. The supply port G has been closed by the charging piston, and the charge previously drawn into or forced into the rear end of the charging cylinder has been forced through the channels 4 and 2 and port D into the front end of the cylinder A, and also through channels 6 and 3 and port E into the rear end of the cylinder B. The exhaust port a is open to the front end of cylinder A by its piston, and the exhaust port b is open to the rear end of cylinder B by its piston. The charges previously compressed in the rear end of cylinder A and in the front end of cylinder B are now ignited simultaneously. When the crankshaft has been revolved half a revolution from the position shown, the charges in the front

end of cylinder A and in the rear end of cylinder B are compressed, and the products of combustion are exhausted from the rear end of cylinder A and from the front end of cylinder B, new charges being supplied to take the place of the exhaust by the charging piston from the front end of the charging cylinder.

The piston of each power cylinder forms a valve for controlling the inlet and exhaust ports of its own cylinder; and the piston of the charging cylinder forms a valve for connecting the ends of the charging cylinder alternately with the front end of one power cylinder and the rear end of the other power cylinder.

What I claim is:

1. In a gas engine, the combination, with a charging cylinder provided with supply ports for air and fuel, of two power cylinders arranged one on each side of the charging cylinder and provided with exhaust ports at their middle parts, said cylinders having also inlet ports at their middle parts between the charging cylinder and the respective power cylinders, pistons sliding in all the said cylinders, the charging cylinder and its piston being provided with channels which place the ends of the charging cylinder in communication alternately with the front end of one power cylinder and the rear end of the other power cylinder, a crankshaft, and driving connections

between all the said pistons and the crankshaft.

2. In a gas engine, the combination, with a charging cylinder provided with supply ports for air and fuel, of two power cylinders arranged one on each side of the charging cylinder and provided with exhaust ports at their middle parts, said cylinders having also inlet ports at their middle parts between the charging cylinder and the respective power cylinders, pistons sliding in all the said cylinders, the charging cylinder and its piston being provided with channels which place the ends of the charging cylinder in communication alternately with the front end of one power cylinder and the rear end of the other power cylinder, a crankshaft provided with cranks on opposite sides of its center, driving connections between the said cranks and the respective pistons of the power cylinders, an eccentric on the said crankshaft of less throw than the said cranks, and driving connections between the said eccentric and the piston of the charging cylinder, said eccentric being set in line with one of the said cranks.

In testimony whereof I have affixed my signature in the presence of two witnesses.

PATRICK B. O'CONNELL.

Witnesses:

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