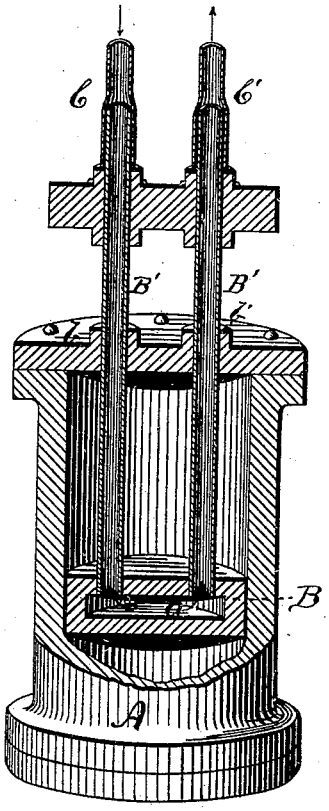
G. B. BRAYTON.

PISTON FOR AIR AND GAS ENGINES.

No. 190,411. Patented May 8, 1877.



WITNESSES:

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IMPROVEMENT IN PISTONS FOR AIR AND GAS ENGINES.

Specification forming part of Letters Patent No. **190,411**, dated May 8, 1877; application filed October 19, 1876.

To all whom it may concern:

Be it known that I, GEORGE B. BRAYTON, of Exeter, in the county of Rockingham, in the State of New Hampshire, have invented certain new and useful Improvements in the Construction of Pistons of Air and Gas Engines; and I do hereby declare that the following specification, taken in connection with the drawings making a part of the same, is a full, clear, and exact description thereof.

My invention consists in constructing the piston with a hollow chamber, which chamber is in combination with two hollow piston-rods, so as to provide a means for the continuous circulation of a stream of cold water through the piston and its rods.

It is not new to provide for a circulation of water within a piston of an air or gas engine; but the means heretofore employed for accomplishing this end were of such a character as to preclude the attainment of practically-valuable results in double-acting engines.

In the drawings, A represents the cylinder, and B the piston, of the engine. The necessary valves and passages for admitting the motive agent, so as to act against one side of the piston, and afterward against the other, for driving the piston to and fro within the cylinder, are omitted, for the reason that such adjuncts of a complete machine constitute no part of the present invention, and are not necessary for an understanding of the same. It is to be understood, however, that the engine has suitable valve mechanism for enabling the motive force to be properly introduced into the cylinder alternately upon opposite sides of the piston; that it has suitable exhaust passages; and that its piston-rod is connected with a crank-shaft or other means for converting a reciprocating into a rotary motion.

The interior of the piston is formed into a chamber, as seen at *a*. The piston-rods are two in number, B′ B′, each of which has its axis hollow, and communicates with the piston-chamber *a*, and each has its appropriate stuffing-box *b b′* in the upper cylinder-head.

Each hollow piston-rod has attached to it a flexible tube, C C′. The tube C, representing the one through which the supply of cold water is introduced, should be connected at its other end with some suitable source of water-supply, so that a constant stream of cold water can flow, under same pressure, through the piston B, into the chamber *a* of the piston, and be discharged by passing upward through the piston-rod B′, and thence be conducted, through the flexible tube C′, to any point where it is to be wasted, or utilized for any purpose.

The source of water-supply may be a tank or cistern elevated above the cylinder, so as to exert a pressure due to its gravity; or water may be injected by a force-pump; or its supply may be obtained from a street-main.

By this construction the pistons of engines of this class can be kept so cool that it is entirely practicable to furnish the cylinder with heads at both ends, and apply the agent of force alternately upon each side of the piston without injury from overheating, either to the piston or to the interior surface of the cylinder; and in case a motive power derived, in part, from the lighter products of petroleum-oils be employed, it will be found that the heat is insufficient to decompose the constituents of the oil and leave a deposit upon the surface of the cylinder, but, on the contrary, the surface of the cylinder and the sides of the piston remain clean and bright.

While it will be found generally very convenient to make use of flexible tubes in combination with the hollow piston-rods and piston, as described, it is quite apparent that metallic pipes may be substituted for such tubes, and the piston-rods be connected therewith by causing the latter to slide within the bore of such pipes, and the joints made tight by suitable packing.

I do not claim, broadly, cooling the piston of an air and gas engine by means of a circulating stream of water; but

What I claim as my invention, and desire to secure by Letters Patent, is—

The combination, with a piston having an interior chamber, of two separate hollow piston-rods, communicating directly with the chamber of the piston, one of which piston-rods is connected with a water-supply, whereby a continuous stream of water can flow through the piston for cooling the same, substantially as described.

GEORGE B. BRAYTON.

Witnesses:

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