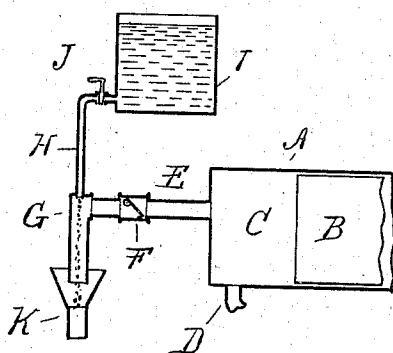


(No Model.)

R. E. OLDS.
COMBINED GAS AND STEAM ENGINE.

No. 570,263.

Patented Oct. 27, 1896.



Witnesses:
P. M. Halbert
W. H. Jones

Inventor:
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By *W. L. Sprague*
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UNITED STATES PATENT OFFICE.

RANSOM E. OLDS, OF LANSING, MICHIGAN.

COMBINED GAS AND STEAM ENGINE.

SPECIFICATION forming part of Letters Patent No. 570,263, dated October 27, 1896.

Application filed August 13, 1895. Serial No. 559,160. (No model.)

To all whom it may concern:

Be it known that I, RANSOM E. OLDS, a citizen of the United States, residing at Lansing, in the county of Ingham and State of Michigan, have invented certain new and useful Improvements in a Combined Gas and Steam Engine, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates more specifically to an attachment for gas or vapor engines whereby the motive power is derived from the combustion of gas or vapor, supplemented in a measure by the power of steam obtained and generated directly in the combustion-chamber of the engine by the introduction of small quantities of water simultaneously with the gas, and whereby the heat generated by the explosion converts the same into steam and contributes to the motive power of the engine, all as more fully hereinafter described, and shown in the drawing, which represents my invention in diagram.

A represents the cylinder, B the piston, C the explosive-chamber, and D the gas-inlet, all arranged in the usual manner and forming the ordinary parts of a gas-engine in which the explosion of the gas or vapor in the chamber C creates the motive power.

My attachment consists in providing the explosive-chamber with an induction-pipe E, which is provided with an inwardly-opening check-valve F and opens directly into the offset-pipe or elbow G. Into this elbow or offset leads a vertical pipe H, leading from a suitable supply-tank I, which is governed by a suitable valve J, all in such manner that a small stream of water may be allowed to escape through the pipe H and, flowing through the offset or elbow, may be received and carried off by an overflow K.

In practice my device is designed to operate as follows: Whenever the movement of the piston creates a vacuum in the explosive-chamber C and the gas or vapor is introduced into the chamber, the same suction will create

a draft or air-current to pass in through the offset-pipe and induction-pipe E and act as a carrier for a small quantity of water up from the stream of water escaping. This quantity of water I regulate so that it will be thoroughly absorbed and converted into steam with each explosion of the gas in the cylinder and thereby create a supplemental motive power.

My device economizes in the use of gas or vapor and by absorbing some of the heat prevents overheating and at the same time forms an excellent lubricating device for the piston.

I do not intend to confine myself to any special construction of introducing the water at each aspiration of the gas, but the construction I have shown I consider to be simple and well adapted for the purpose.

What I claim as my invention is—

1. In combination with a cylinder of a gas-engine, an attachment comprising an induction-pipe provided with a check-valve and leading into the cylinder, a vertically-disposed offset-pipe out of which the induction-pipe leads and having an air-opening therein, means for discharging a liquid into the vertical pipe from a point above the plane of the induction-pipe, and an overflow-pipe below the offset-pipe, substantially as described.

2. In a gas-engine, the combination with a cylinder, its piston, and a gas-supply leading to the cylinder, of an induction-pipe leading into the cylinder, a valve therein, a vertical pipe with which the induction-pipe communicates, having an opening for the admission of air, and means for introducing a liquid into the vertical pipe comprising a pipe of a diameter at its discharge less than that of the vertical pipe.

In testimony whereof I affix my signature in presence of two witnesses.

RANSOM E. OLDS.

Witnesses:

M. B. O'DOHERTY,
S. M. HULBERT.