

No. 879,954.

PATENTED FEB. 25, 1908.

C. M. FOX.
EXPLOSIVE ENGINE.
APPLICATION FILED FEB. 11, 1907.

Fig. 1.

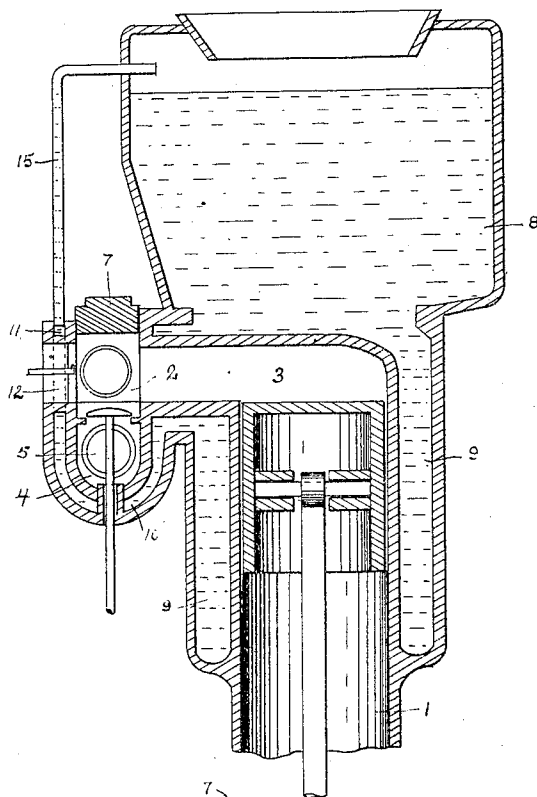
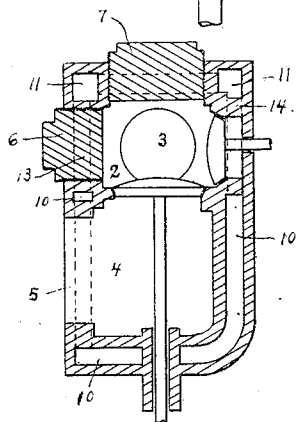


Fig. 2.



Witnesses

Millard Haskell
J. L. Weaver

Inventor

Charles M. Fox,

By Walter N. Haskell,

his Attorney

UNITED STATES PATENT OFFICE.

CHARLES M. FOX, OF DE KALB, ILLINOIS.

EXPLOSIVE-ENGINE.

No. 879,962.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHARLES M. FOX, a citizen of the United States, residing at De Kalb, in the county of DeKalb and State of Illinois, have invented certain new and useful Improvements in Explosive-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, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention has reference to explosive engines, and relates more particularly to means for cooling those parts of the engine which are liable to become super-heated by the operation thereof.

My device comprises a system of water-compartments, embracing the explosion chamber and parts of the engine appurtenant thereto, and communicating with each other; a reservoir for holding a supply of water to be furnished to said system of water-compartments; and means for producing a continuous and automatic circulation of the water through such compartments and reservoir, whereby said explosion chamber, and appurtenant parts of the engine, are constantly provided with a fresh supply of cooler water from the reservoir. I am aware that it is common to provide engines of this class with water-cooling means, but the water soon becomes heated by the combustion of the successive charges of gas, until the over-heating of the operating parts is no longer prevented thereby. By the use of my invention the constant replacing of the water which surrounds the internal mechanism with cooler water prevents such mechanism from becoming over-heated and rendered inoperative.

The mechanical construction and operation of my device will more fully appear in the following specification, reference being had to the drawings accompanying the same, in which:

Figure 1 is a central vertical section of the upper part of an engine embodying my invention. Fig. 2 is a central vertical section of the explosion and exhaust chambers, at right angles to the section thereof in Fig. 1 and looking in the direction of the engine.

1 is the upper part of the cylinder; 2 the

explosion chamber; 3 an expansion chamber, communicating with the chamber 2 at one end, and with the cylinder 1 at the opposite end; and 4 the exhaust chamber, provided with an outlet 5. For the purpose of access to the chamber 2, for installing the necessary valves therein, such chamber is provided with circular openings, which are normally closed by plugs 6 and 7.

Immediately above the cylinder 1 and inner end of the chamber 3 is a water bowl, or reservoir 8, extending downwardly into a water jacket 9, surrounding the upper part of the cylinder. Inclosing the exhaust chamber 4 is a water-compartment 10, communicating with the water jacket 9, and also with the reservoir 8 around the outer end of the chamber 3. Above the explosion chamber 2 is a water chamber 11, communicating with the reservoir 8 above the chamber 3, and also communicating with the compartment 10 by means of passages 13 and 14, (dotted lines). Inserted in the reservoir 8, at or near the upper part thereof, is a pipe 15, the lower end of such pipe being connected with the water-chamber 11.

In the operation of the engine, the water surrounding the cylinder 1 and the chambers 2, 3 and 4 becomes heated to such an extent that steam is formed therein, a portion of such steam and heated water passing upwardly through the pipe 15, the water being returned to the reservoir 1, and remaining on the surface of the water therein. As the water passes upwardly through the chambers 10 and 11 and pipe 15, such chambers are supplied with fresh water from the reservoir and water jacket, and in this way a constant circulation of the water is kept up, and the cooler water in the lower part of the reservoir is at all times moving downwardly around the parts which become heated. It will be seen that if the pipe 15 were not provided the water would be retained within the compartments 10 and 11, and become so heated as to be of no use in preventing excessive heat in the parts surrounded thereby.

By reason of the constant changing of the water about the operating parts, a comparatively small amount thereof becomes converted into steam, and the replenishing of the water in the reservoir 8 is a small matter. In similar devices wherein the evaporation of the water is more rapid, a new supply of water must be provided frequently.

What I claim as my invention, and desire to secure by Letters Patent of the United States, is:

1. In a device of the class named, the combination with the explosion chamber 2 and exhaust chamber 4, of the water compartment 10, inclosing the chamber 4, the water chamber 11, communicating with the compartment 10; the reservoir 8, communicating with the chambers 10 and 11, and the pipe 15, connecting the chamber 11 and upper part of the reservoir 8, substantially as shown and for the purpose set forth.

2. In an explosive engine, the combination with the cylinder 1, explosion chamber 2, expansion chamber 3 and exhaust chamber 4 thereof, of a reservoir 8, located above

said cylinder; a water-jacket 9, surrounding the upper part of said cylinder, and opening upwardly into the reservoir 8; a water compartment 10, inclosing the exhaust chamber 4, and communicating with the water jacket 9; a water-chamber 11, above the chamber 2, and communicating with the water compartment 11 and a pipe 15, connecting the chamber 11 with the upper part of the reservoir 8, substantially as shown and described.

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

CHARLES M. FOX.

Witnesses:

SIMON C. JOHNSON,
GEORGE H. MILLER.