T. J. LOFTUS.

COOLING MEANS FOR GASOLENE ENGINES.

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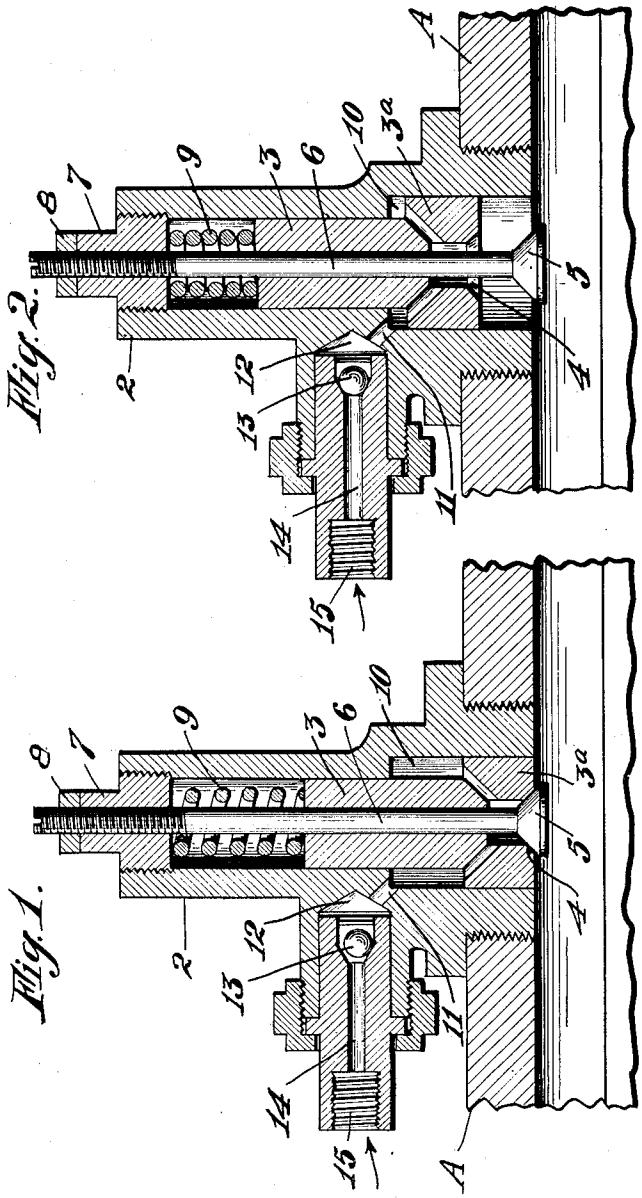
1,040,709. Patented Oct. 8, 1912.



Witnesses:

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UNITED STATES PATENT OFFICE.

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COOLING MEANS FOR GASOLENE-ENGINES.

1,040,709. Specification of Letters Patent. Patented Oct. 8, 1912.

Application filed May 9, 1911. Serial No. 625,984.

To all whom it may concern:

Be it known that I, THOMAS J. LOFTUS, a citizen of the United States, residing at Castella, in the county of Shasta and State of California, have invented new and useful Improvements in Cooling Means for Gasolene-Engines, of which the following is a specification.

My invention relates to means for cooling the cylinders of gasolene engines, and at the same time providing a superheated vapor which will act in unison with the gas and by its expansion increase the effectiveness of the engine.

It consists in the combination of parts and in details of construction, which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a view of a portion of the apparatus, showing the plunger and valve at the normal closed position. Fig. 2 shows the parts at the instant of the explosion within the cylinder.

I have here shown the device as applied to a cylinder, indicated at A, and it consists of a cylinder 2, the inner end of which may be threaded to screw into the wall of the cylinder at the proper point. It may have an annular flange or shoulder which will screw down closely against the exterior, as shown. Within this cylinder is a plunger 3 which is movable in or out of the cylinder 2, and which has a valve seat 4 closable against a valve 5; this valve being fixed in position by means of its stem 6 which is adjustably fixed in the plug 7 in the outer end of the cylinder 2 and being secured by a lock nut 8. The upper end of this stem 6 is threaded as shown, so that by turning this stem the valve 5 may be adjusted at will.

Between the top of the plunger 3 and the plug 7 is located a spring 9, which normally acts against the top of the plunger to force it down and cause its seat to close against the valve 5, which is held stationary by its connection with the plug 7. The lower part of the plunger 3^a is of greater diameter than the upper portion and reciprocates in a correspondingly larger diameter of its cylinder. Between the top of this enlarged diameter 3^a and the top of the plunger is formed an annular chamber 10 which is normally opened by the pressure of the spring which forces the plunger down into contact with the valve 5, as before described.

A passage 11 opens into this chamber 10 and connects with a valve chamber 12, having a seat and a check valve 13, which normally closes upon this seat and controls a passage 14, through which water is admitted by a suitable connection through the inlet at 15. The plunger being closed against the valve by the action of the spring 9, the chamber 10 in the larger part of the cylinder above the plunger will be in a position to receive water through the inlet; and the closure of the plunger seat against the valve 5 makes a tight joint, preventing any leakage of water, compressed air or gases. Water can then flow through the inlet passages 14 and 11 and fill the annular recess 10.

The engine being in operation, the instant the gases are exploded the pressure generated acts upon the exposed end of the plunger, and forces it outward against the water contained in the recess 10. The water contained in this chamber is thus forced through the passages 16, which lead from the chamber into the space around the valve which is now opened, and the water will pass into the explosion chamber and will be instantly converted into superheated steam, adding its force to that of the exploded gases. When the exhaust takes place, the pressure upon the plunger is reduced and the spring 9 then acts to again force the plunger down and close the passages against the seat, allowing a new supply of water to enter the chamber 10.

The amount of water injected is regulated by the screwing of the valve stem 6 in or out through the plug 7, and this increases or decreases the annular recess 10 and regulates the amount of water admitted thereto through the connecting passages. This water serves to cool the interior of the cylinder and is instantaneously flashed into superheated steam by the heat of the gases ignited; the action being, first, the direct cooling, and second, the additional cooling caused by the expansion into steam.

Having thus described my invention, what I claim and desire to secure by Letters Patent is—

1. A device to au omatically inject water into the cylinder of an internal combustion engine, said device including a supplemental cylinder fixed in the engine cylinder and having parts of two diameters, the larger of which is contiguous to the engine cylinder, a

spring pressed plunger with parts of two diameters fitting the supplemental cylinder, passages converging from the junction of the parts of two diameters of the plunger to the bottom of the part of larger diameter, a fixed valve against which the plunger normally closes, and a valve controlled water inlet connecting with the cylinder at the junction of its parts of two diameters.

2. A device to automatically inject water into the cylinder of an internal combustion engine, said device comprising a supplemental cylinder fixed in the main cylinder, having parts of two diameters, and a closure for the outer end, a valve member located contiguous to the main cylinder and having a stem screw-threaded and adjustable in the closure at the outer end, a plunger fitting the parts of two diameters, bored for the passage of the valve stem and having a seat in its lower end, a spring by which the plunger seat is normally closed upon the valve member and raised therefrom by explosions in the main cylinder, ports connecting said seat with the junction of the parts of two diameters of the plunger, and a valve controlled source of water supply thereto.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

THOMAS J. LOFTUS.

Witnesses:

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