

C. H. SERGEANT.
INTERNAL COMBUSTION ENGINE.
APPLICATION FILED OCT. 13, 1908.

932,184.

Patented Aug. 24, 1909.

Fig. 1.

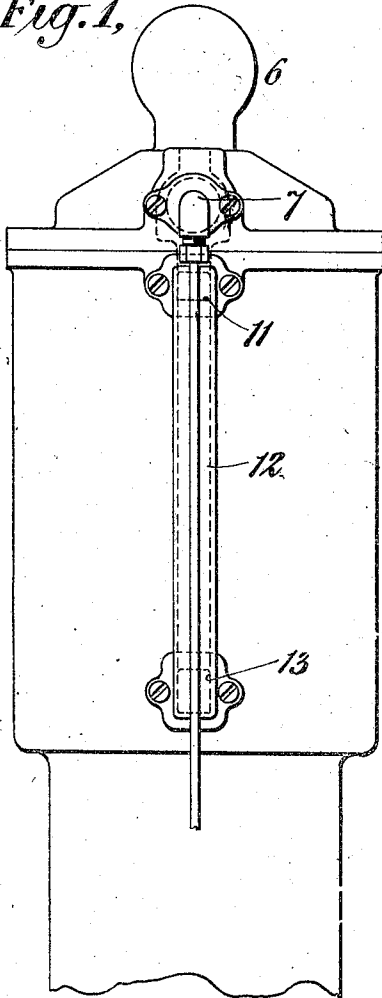
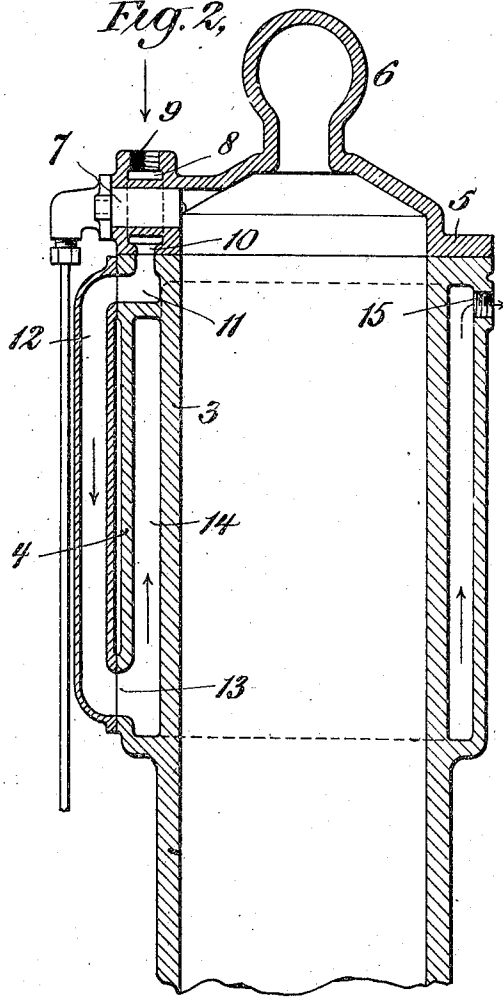


Fig. 2.



WITNESSES:

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UNITED STATES PATENT OFFICE.

CHARLES H. SERGEANT, OF NEW YORK, N. Y.

INTERNAL-COMBUSTION ENGINE.

932,184.

Specification of Letters Patent.

Patented Aug. 24, 1909.

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To all whom it may concern:

Be it known that I, CHARLES H. SERGEANT, a citizen of the United States of America, and a resident of New York, county of New

York, State of New York, have invented certain new and useful Improvements in Internal-Combustion Engines, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

My invention relates to improvements in internal combustion engines, and particularly to means for cooling certain parts thereof including the cylinder and the fuel injecting nozzle. It is common in this type of engine, to jacket the cylinder and to maintain a circulation of water through the jacket by admitting such water to the jacket at the lower end thereof and permitting it to escape at the upper end. This permits natural circulation because the upper end is very much hotter than the lower, and hence the water, in heating, is given a tendency to rise and thus to circulate in the manner desired.

In the type of engine in which a nozzle is employed for injecting fuel oil, it is highly desirable that such nozzle be kept reasonably cool, but this nozzle is necessarily located at or near the upper end of the cylinder, and hence at the hottest part thereof. Furthermore, in the circulation of cooling medium as just described, such cooling medium has itself become considerably heated before it reaches the portion surrounding the nozzle and hence it has less capacity to take up heat at this point.

In my present invention, I admit the cooling medium first around the nozzle so as to obtain the greatest cooling effect possible at this point. Thereafter I conduct the cooling medium directly to the lower end of the cylinder, and thus permit the same natural circulation as has been common heretofore by permitting the cooling medium to flow up and around the cylinder until it is finally discharged at the upper end thereof. The result of this is that the nozzle is kept cool, yet there is not sufficient heat imparted to the cooling means to prevent or impede the natural circulation caused by permitting the cooling medium to flow thereafter upward around the cylinder from the lower cooler portion to the upper hotter part.

In order that my invention may be fully understood, I will now proceed to describe

an embodiment thereof, having reference to the accompanying drawings illustrating same, and will then point out the novel features in claims.

In the drawings: Figure 1 is a view in exterior elevation of certain parts of an internal combustion engine including the cylinder and nozzle thereof, the same being constructed in accordance with my invention. Fig. 2 is a view in central vertical section therethrough, the point of view of Fig. 2 being taken at right angles to the point of view of Fig. 1.

Reference character 3 designates the cylinder of an internal combustion engine, the upper or working portion of which is surrounded by a jacket 4. 5 is the upper head, the central portion of which is formed into a dome 6. A fuel injecting nozzle 7 is located at the upper end of the cylinder, being, in the present instance, introduced through an opening in the upper head 5. The head 5 is provided with a jacketed portion, said portion inclosing a chamber 8 which surrounds the said nozzle 7. A pipe connection 9 is provided at the upper end of said jacketed portion, said pipe connection opening into the chamber 8, and at its lower end the chamber 8 communicates through a passage 10 with a passage 11 in the upper end of the chamber 3. This passage 11 is connected by means of a pipe connection 12 with the inlet port 13 of the chamber 14 which is inclosed by the jacket 4, and the said jacket 4 is provided with a pipe connection 15 at its upper end through which water which has been employed as a cooling medium may be discharged.

In operation, water is admitted through the pipe connection 9 in the direction of the arrow shown, such cooling medium passing immediately into the chamber 8 around the nozzle 7 whereby to thoroughly cool the said nozzle 7 and to keep the same in a cool condition. This cooling medium then passes through the passages 10 and 11 and along the pipe connection 12 into the cylinder cooling chamber 14, being admitted thereto through the admission port 13 at the lower end thereof. The cooling medium passes thence upward through the chamber 14 around the cylinder 3, and is finally discharged through the pipe connection 15 at the upper end of the said chamber.

What I claim is:

1. In an internal combustion engine, the

combination with a cylinder and a water jacket therefor, of a fuel nozzle arranged at the upper end of the cylinder, a water jacket for the said nozzle, means for admitting cooling medium to the said nozzle water jacket, and means for conveying it thence to the opposite end of the cylinder jacket whereby it may return through the cylinder jacket in a direction toward the end of the cylinder at which said nozzle is located.

2. In an internal combustion engine, the combination with a cylinder and a water jacket therefor which incloses a chamber around the cylinder, of a fuel nozzle arranged at the upper portion of the cylinder,

a water jacket for the said nozzle, means for admitting water first to the said nozzle jacket, and a passage independent of the said water jacket chamber of the cylinder for conveying the said water thence to substantially the lowermost portion of the said cylinder jacket chamber, whereby the water will thereafter circulate in the said chamber around the cylinder in a direction toward the upper end thereof.

CHARLES H. SERGEANT.

Witnesses:

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