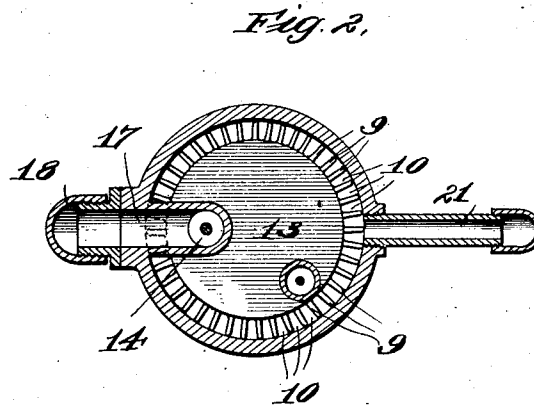
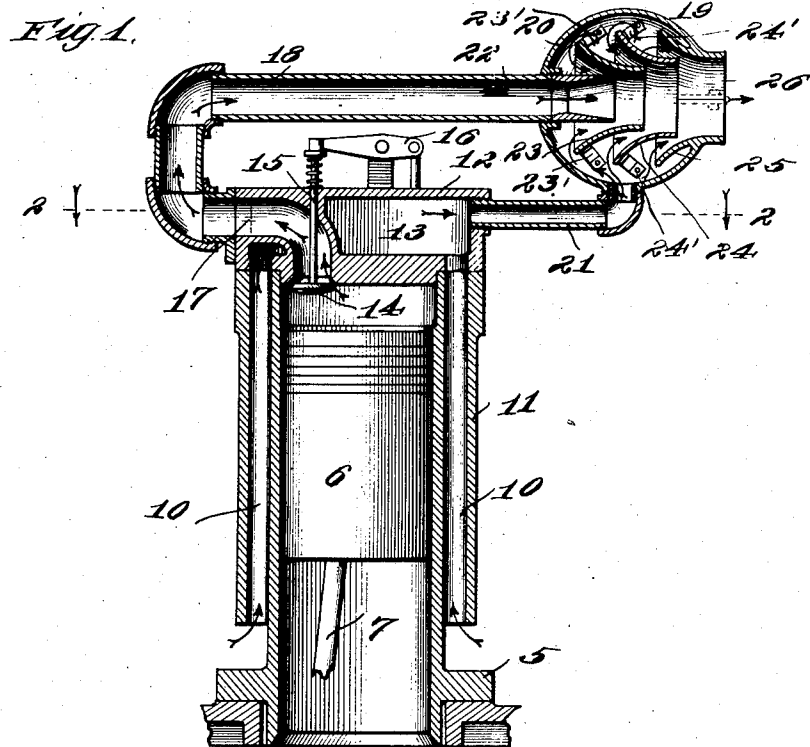


J. DESMOND.
ENGINE COOLING DEVICE.
APPLICATION FILED AUG. 8, 1910.

1,025,251.

Patented May 7, 1912.



Witnesses:

G. A. Paulschmidt
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UNITED STATES PATENT OFFICE.

JOHN DESMOND, OF CHICAGO, ILLINOIS, ASSIGNOR TO WILLIAM S. POTWIN, OF CHICAGO, ILLINOIS.

ENGINE-COOLING DEVICE.

1,025,251.

Specification of Letters Patent.

Patented May 7, 1912.

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To all whom it may concern:

Be it known that I, JOHN DESMOND, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Engine-Cooling Devices, of which the following is a specification.

My invention relates to improvements in engine cooling devices and more particularly to an improved form of cooling structure wherein the energy of the escaping products of combustion is used to induce an air current to pass around the heated engine parts.

The salient object of my invention is to provide a construction of cooling device of the character described involving a minimum number of castings, each cheaply made and durable in use, which may be easily assembled and maintained in association with a suitable ejector, to provide an engine structure in which not only the cylinder walls are kept cool but the pipe leading immediately from the exhaust valve is cooled by being entirely surrounded by air draft which passes through a hollow head casting forming part of the device.

In the drawings, wherein I have shown my improved structure, Figure 1 is a central longitudinal section of an engine cylinder with my cooling device attached thereto; Fig. 2 is a cross sectional view taken on line 2-2 of Fig. 1; and

In both of the views the same reference characters indicate similar parts.

5 is a conventional representation of a cylinder casting of an engine provided with a piston, 6, and a connecting rod, 7. On the outside surface of the cylinder are radially projecting ribs, 9, which are integrally formed with the cylinder wall, and extend vertically and parallel with the axis of the cylinder to provide therebetween channels or air conduits, 10. Around the ribs, 9, I place a cylindrical casing, 11, which may be an integral part of the cylinder or which is preferably separable and made of relatively thin sheet iron and this casing incloses the channels between adjacent ribs and forms independent conduits 10 thereof. I provide a separable cylinder head casting 12, such as shown in the drawing, having a hollow part 13 which communicates through its bottom wall with each and all of the

conduits 10. The conventional exhaust valve 14 with valve stem 15 and beam 16 are shown mounted upon the head casting with the exhaust pipe leading through the hollow head chamber 13 to be surrounded by the air draft in said chamber. To the part 17 of the exhaust valve, I connect a pipe 18 through which to convey the burned products of combustion.

An ejector, 19, comprises, preferably, a spherical shell, 20, to which is connected an air pipe, 21, the latter being also connected to the hollow cylinder head, 12. It will be observed that a nozzle, 22, is connected to the end of the pipe 18. It is slightly contracted near its middle to increase the velocity of the passing gases, and then it is taperingly increased in diameter to its end to give tapering form to the outgoing gases, that they may substantially fill the smaller end of the combining cone-tube, 23. The cone-tube, 23, is spaced apart from the similar tube 24, each being secured to the shell, 20, by fastening devices 23' and 24', respectively. Tube, 24, is spaced apart from tube 25, the latter being shown as an integral part of the casing.

There may be as many of the combining tubes, such as 23, 24, 25, etc., as desired within the casing. I have attained most excellent results from a structure in all essential respects such as illustrated in the drawing, but, of course, any ejector operating like the one above described may be used as a part of my improved structure. The opening 26 of the casing 20, may be connected to a subsidiary muffler by a pipe or the exhaust may escape therefrom directly into the atmosphere.

The ejector device, besides inducing active circulation of air around the heated engine parts also serves as a muffler to some extent and may be extended so as to entirely displace mufflers of the usual type.

The arrows show the direction of the exhaust gases through the ejector. The arrows also show the direction of air currents induced by the exhaust gases passing through the ejector device.

The operation of the device is so apparent as not to require further or extended description.

It will be observed that the structure which I have described is capable of cheap manufacture, easy assemblage and maintenance.

nance, and efficient operation, owing to the correlation of the several castings and appurtenant parts, and I therefore limit myself only to such structure which utilizes the novel correlation of parts, though otherwise changed in unessential details, not specifically recited in the following claim.

What I claim is:

10 In a device of the character described, an engine cylinder casting providing a central piston-receiving chamber open at both ends and providing upon its outer surface a plurality of integral ribs extending from end to end of the cylinder, a cylindrical casing surrounding said cylinder to form
15 independent conduits between said ribs; a separable head casting, of substantially the diameter of said engine cylinder structure, said head casting having a bottom portion
20 for engagement over the upper end of said cylinder casting and surrounding casing to close the open head end of said cylinder casting, and providing above said bottom portion a head chamber having independent
25 apertures through said bottom portion registering with said air conduits, an exhaust

pipe integral with said head casting and leading from the bottom to the side thereof through the head chamber, a suitable valve and valve operating means associated with said exhaust pipe, an air exhaust opening in the opposite side of said head, an ejector providing an inlet and an outlet for the products of combustion from said cylinder and an inlet for air, means whereby current between said inlet and outlet for products of combustion induces flow of air through said air inlet, and suitable piping connections between said air outlets of the head casting and the air inlet of the ejector casing, and between the exhaust outlet of the head casting and the exhaust inlet of said ejector casing, said piping connections supporting the ejector in association with said cylinder and head castings; as shown.

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

JOHN DESMOND.

In the presence of—

W. LINN ALLEN,
MARY F. ALLEN.