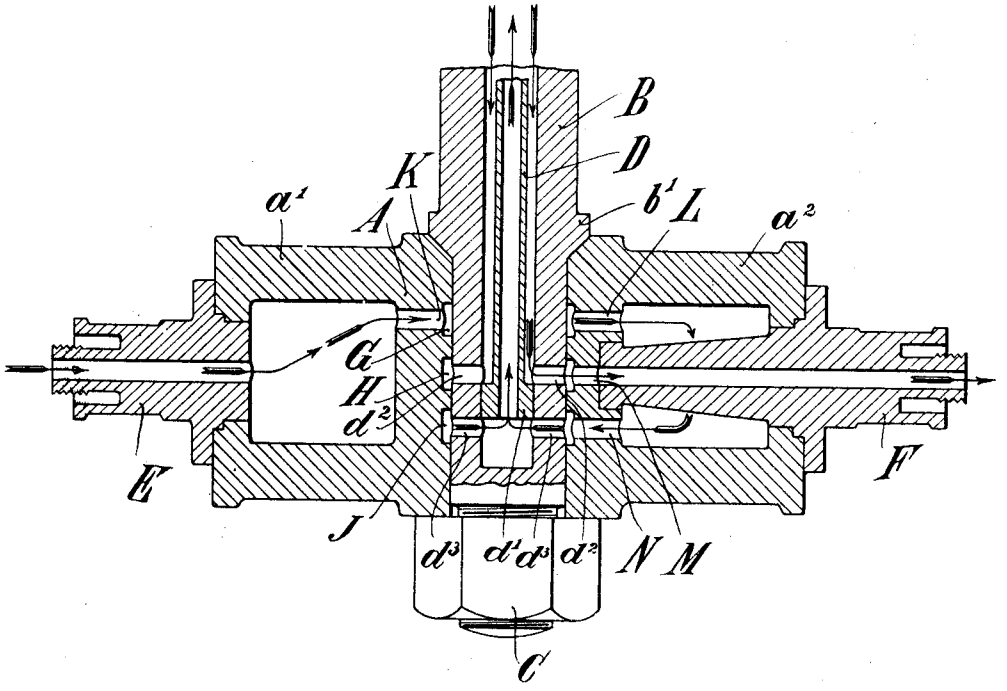
V. REMBOLD.

PISTON COOLING DEVICE FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED MAY 15, 1913.

1,121,202. Patented Dec. 15, 1914.



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PISTON-COOLING DEVICE FOR INTERNAL-COMBUSTION ENGINES.

1,121,202. Specification of Letters Patent. Patented Dec. 15, 1914.

Application filed May 15, 1913. Serial No. 767,829.

To all whom it may concern:

Be it known that I, VIKTOR REMBOLD, a citizen of the German Empire, residing at Kiel, Germany, have invented certain new and useful Improvements in Piston-Cooling Devices for Internal-Combustion Engines, of which the following is a specification.

The water supply to the pistons in internal combustion engines is generally transmitted by the assistance of the cross head; and the water transmission has heretofore been carried out in this manner, that the cooling water has been let into the piston through one of the two cross head trunnions and a channel in the piston rod and then transmitted into the second cross head trunnion through a second channel mostly concentric with the first channel in the piston rod, and from there into the outlet pipe. This kind of piston cooling device possesses the disadvantage that the two trunnions on the cross head inclosed by the bearings of the connecting rod will have quite a different temperature, because the trunnion at one end where the fresh water is admitted and through which the cold water is flowing will experience a considerable cooling; while the second trunnion situated at the place where the cooling water is discharged will be heated by the water passing through the piston and receiving its heat therefrom, which naturally will favor this trunnion to run hot.

The object of the present invention is now to remove this disadvantage and to enable a good cooling of the piston as well as of the two trunnions of the cross head.

One embodiment of the invention is illustrated in the accompanying drawing showing the piston cooling device in cross section.

The cross head A is secured to the hollow piston rod B by means of a shoulder b^1 and a nut C. The trunnions a^1 a^2 of the cross head are hollow and carry studs E and F for the admittance and discharge of the cooling water. A pipe D of smaller diameter is inclosed in the boring of the piston rod B, and by means of a shoulder d^1 fits tightly therein. This pipe effects in the usual manner the admittance of water to the piston, while the annular chamber formed between the pipe and the inner walls of the piston rod serves as return duct for the cooling water. In the boring of the cross head which receives the piston rod are provided three grooves, which form annular channels G, H and J in conjunction with the piston rod. Of these channels the one G is connected with the hollow chambers of the two trunnions a^1 and a^2 on the cross head by means of the borings K and L; the annular channel H on the other hand is connected with a discharge passage in the stud F by means of the boring M, and by means of borings d^2 it is connected with the hollow chamber of the piston rod. Lastly the annular channel J is brought into connection with the right hand trunnion a^2 on the cross head by means of the boring N and by means of the borings d^3 with the inside of the pipe D. Flexible pipes, not shown on drawing, are attached to the studs E and F, which pipes provide the admittance and discharge of the cooling water.

The direction of the cooling water in passing through the cross head is indicated by arrows in the drawing and will be easily understood. The water entering through the stud E into the hollow chamber of the left hand trunnion a^1 of the cross head, flows through the boring K, the annular channel G and the boring L into the hollow chamber of the right hand trunnion a^2 and from there through the boring N, the annular channel J, the borings d^3 and the pipe D to the piston (not represented in the drawing). The heated cooling water flows back from the piston through the annular passage formed between the pipe D and the inner wall of the piston rod B, the borings d^2, the annular channel H, the boring M and the outlet stud F. As the cooling water before its entering the piston, travels, in still cold condition, first through the hollow chambers in the two trunnions of the cross head, the use of the described cooling device for the piston will effect in a very simple manner a good cooling of the two trunnions of the cross head.

I claim:—

1. A piston cooling device for internal combuston engines having a piston, a piston rod and a cross head attached thereto, a pair of trunnions on the cross head provided with hollow chambers and an inlet passage for the cooling water into the chamber of one of said trunnions and a communicating passage between the trunnions; the admittance and discharge of the cooling water taking place through the cross

head and the piston rod, so that the cooling water is conducted into the hollow chambers in both trunnions of the cross head before entering the piston rod.

2. A piston cooling device for internal combustion engines having a piston, a piston rod and a cross head attached thereto, a pair of trunnions on the cross head, having hollow chambers, and an inlet passage for the cooling water into the chamber of one of said trunnions and a communicating passage between the two trunnions; a central pipe in the piston rod opening into the chamber of said second trunnion, a return passage in said piston rod surrounding said pipe and communicating with said pipe in the piston head, a discharge stud in said second trunnion and a channel in said discharge stud communicating with said return passage; whereby the cooling water will enter the chamber of the first trunnion taking its course through the chamber of said second trunnion through said central pipe, piston head and return passage and leaving by the discharge channel in said second trunnion.

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

VIKTOR REMBOLD.

Witnesses:
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