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HEAT EXCHANGER

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2 Claims. (Cl. 252—5)

This invention relates to heat exchangers and more particularly heat exchangers of internal combustion engines. These structures are under a serious handicap of having to transfer enormous quantities of heat across relatively limited surfaces, with water which is generally unsuitable. Furthermore, engines which cannot cool properly have an increased tendency to knock. Anything which will increase the transfer rate is accordingly fundamentally important and highly desirable.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described, and particularly pointed out in the claims, the following description setting forth in detail certain illustrative embodiments of the invention, these being indicative however, of but a few of the various ways in which the principle of the invention may be employed.

In accordance with my invention, there is added to the circulating cooling water in the radiator and engine-jacket passages of an internal combustion engine an amount of an ionizable alkali metal meta-phosphate, such as sodium meta-phosphate. The amount may range in general from 10 to 1000 parts per million, depending somewhat upon the water used. The salt is best dissolved in the entire quantity of the cooling-water before it is filled into the radiator, or for convenience in some cases, particularly where smaller amounts are used and the fluid-circulation is very active, it may be added in concentrated solution, or sufficiently slowly in dry form that proper solution in the cooling-water occurs. Such salt solution raises the heat-transfer coefficient so that the heat from the engine-combustion is more efficiently transferred from the cylinder walls to the solution in the cylinder jackets, and at the same time the meta-phosphate acts on lime and magnesia present, preventing and removing surface-coating thereby. The solution may be operated as a continuously-employed radiator-system cooling fluid particularly where in lower concentrations, or where desired, it may be employed intermittently, alternating with runs on water without such addition.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the features stated in any of the following claims, or the equivalent of such, be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. Method of cooling heat exchanger systems in internal combustion engines which comprises circulating cooling fluid therethrough having an addition of sodium meta-phosphate in quantities sufficient to effectively increase the coefficient of heat transference.

2. Method of cooling heat exchanger systems in internal combustion engines which comprises circulating cooling fluid therethrough having an addition of sodium meta-phosphate, said meta-phosphate being present in amounts of 10–1000 parts per million parts of cooling fluid.

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