

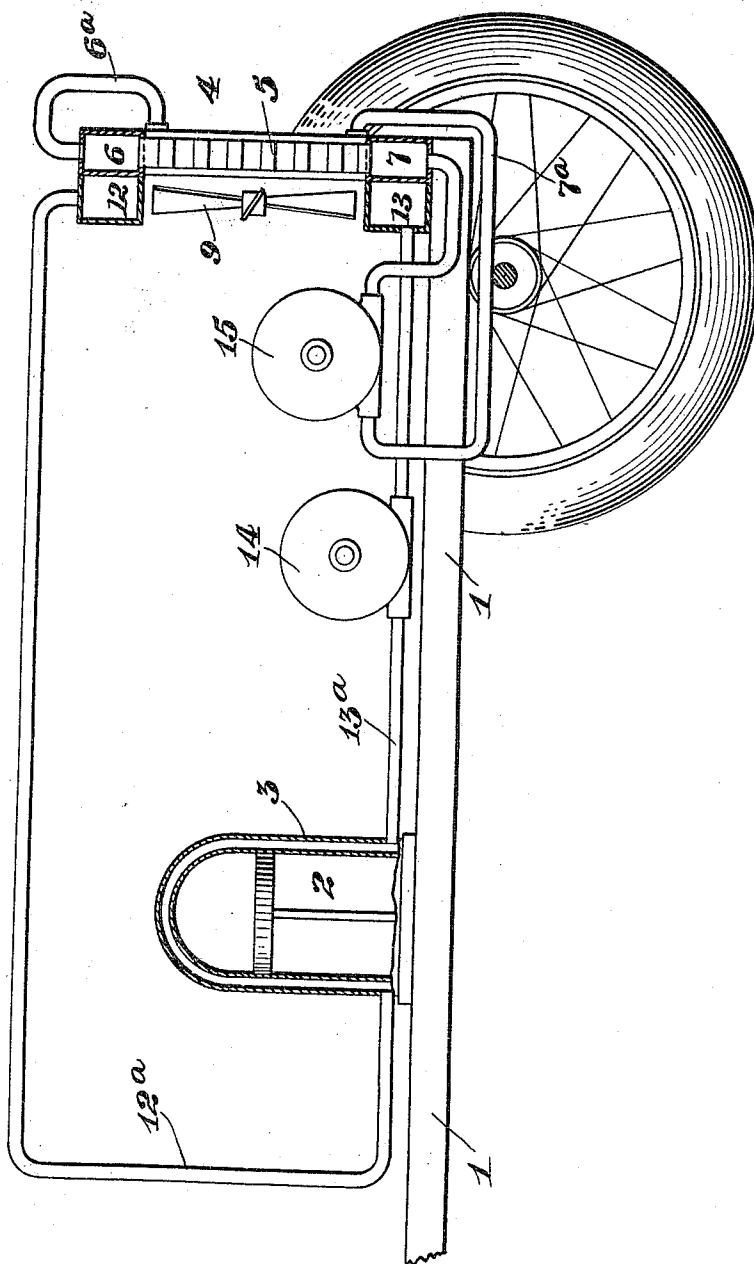
L. CAMMEN.
TEMPERATURE CONTROL APPARATUS.
APPLICATION FILED JULY 27, 1918.

1,296,761.

Patented Mar. 11, 1919.

2 SHEETS—SHEET 1.

Fig. 1.



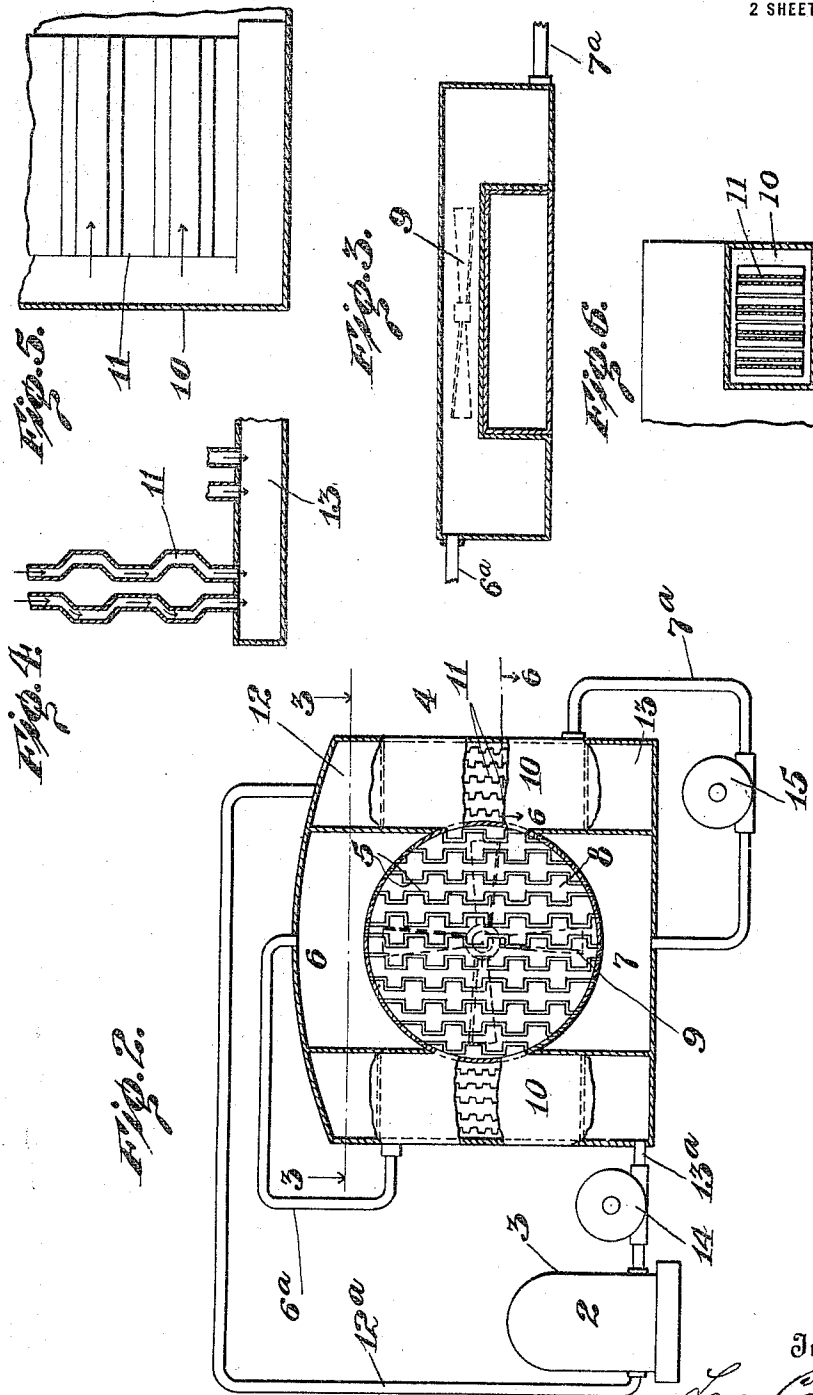
Inventor
Leon Cammen
By *his* Attorney *J. W. Barker*

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UNITED STATES PATENT OFFICE.

LEON CAMMEN, OF NEW YORK, N. Y.

TEMPERATURE-CONTROL APPARATUS.

1,296,761.

Specification of Letters Patent. Patented Mar. 11, 1919.

Application filed July 27, 1918. Serial No. 247,008.

To all whom it may concern:

Be it known that I, LEON CAMMEN, a citizen of the United States, and resident of borough of Manhattan, in the city, county, and State of New York, have invented certain new and useful Improvements in Temperature-Control Apparatus, of which the following is a specification.

This invention relates to temperature control means for internal combustion motors, in those uses thereof where an air cooled radiator is employed, and my present improvements are especially devised to serve in connection with the temperature control system patented by me Feb. 12, 1917, under Patent No. 1,256,109.

In said patent I have established a control system wherein the cooling liquid which circulates about the engine, passes thence to a heat exchanger, where it gives up excess heat to a separate liquid, that itself passes through an air cooled radiator. The same system of cooling is followed in the present application, which however embodies the principle of operation in a specially devised structure, adapted to the particular requirements of the dual system. In this structure the object sought has been that of creating a single apparatus which is substantially in the external form of the usual air cooled radiator, occupying the same position with relation to the internal combustion engine it serves, and so arranged that it comprises within itself the separate, interacting elements of my dual temperature control system.

With this object in view my improved apparatus consists of a combined radiator and heat exchanger, these terms being arbitrarily employed to designate, respectively, the air cooled radiator, which lowers the temperature of a liquid flowing therethrough, and a series of passages which are in closed circuit with the engine jacket, and which subject another liquid passing therethrough, laden with heat from the engine jacket, to the influence of the liquid from the air cooled radiator, to thus dissipate some of the heat from the engine.

In the conventional types of air cooled radiators, having a fan to draw air through their interspaces, the fan is effective over a circular area of the radiator little in excess of the fan radius, so that the air channels in the radiator outside such circular area receive comparatively little cooling.

Therefore in my improved apparatus I utilize only the central portion of the structure for the radiator cooling effect, and the side portions of the structure, which may be extended rearwardly to form a guide for the fan-induced drafts of air, I employ as passageways for the engine circulating liquid, and also as cross-passageways for a flow of the liquid from the air cooled radiator, to thus permit temperature exchange between the engine liquid and radiator liquid.

Other features and advantages of my said invention will hereinafter appear.

In the drawings:—

Figure 1 is a side elevation of a portion of a motor car showing my improved temperature control apparatus.

Fig. 2 is a front sectional view of said apparatus.

Fig. 3 is a section on the line 3—3 of Fig. 2.

Fig. 4 is an enlarged front sectional detail view, showing a portion of the heat exchanger.

Fig. 5 is a side elevation of Fig. 4, and

Fig. 6 is a section on the line 6—6 of Fig. 2.

The illustrations of my invention are somewhat diagrammatic in character, particularly with reference to the pipe connections, but also as to the apparatus, whose structure is generally indicated without regard to any special design, which may be such as is best suited to particular requirements.

In the example given let 1 indicate a motor car, 2 an internal combustion engine having jacket 3, and 4 my improved temperature control apparatus, which is arranged to provide a dual circulatory system, with air cooling means, for one flow of liquid, and means for cooling the other flow of liquid by the air cooled flow. Thus, the radiator portion of the apparatus consists of the centrally disposed channels 5, in communication with the upper and lower headers 6, 7, to permit the gravity flow of liquid therethrough, said channels being separated by air passages 8, according to usual radiator practice, with a fan 9, to induce rapid draft of air.

The channels 5 and passages 8 are caused to occupy an area which is vertically circular, and which only slightly exceeds the circumference of the fan 9, mounted rearwardly thereof.

The radiator portion aforesaid is flanked at each side thereof with a casing 10, that contains series of channels 11, communicating with upper and lower headers 12, 13; said channels 11 being spaced apart from each other and from the walls of casing 10; so that while one passage for liquid is provided through said channels, another passage for liquid is provided through the casing 10 and about said channels.

The engine jacket connects by pipe 12^a with header 12, and by pipe 13^a and pump 14, with header 13.

The header 6 of the radiator connects by pipe 6^a with top of casing 10, and the header 7 connects by pipe 7^a and pump 15 with the bottom of casing 10.

Assuming the pumps 14 and 15 to be in operation, the dual system will function as follows:—

Liquid from lower header 13 will be pumped to the engine jacket and thence to the upper header 12, whence it will flow by gravity, through the channels 11, back to lower header 13. This flowing liquid loses heat in passing through channels 11 for the following reason: The casing 10 is a heat exchanger, because liquid, which flows by gravity from header 6, through passages 5 of the radiator, is, thus cooled, forced by pump 15, from header 7 and pipe 7^a, up through casing 10, in which it immerses the channels 11, and returning, from the upper portion of casing 10, through pipe 6^a, back to radiator head 6. There are thus established, in the unified structure, two separate flows of liquid, one to be cooled by air, with fan action, and that flow to cool the other flow, which comes laden with heat from the engine.

While the depth of the air cells of the radiator is limited to avoid excessive friction of the passing air, the casing 10, and headers 12, 13, are extended rearwardly, and may form a confining channel or guide for the circular column of air induced by the fan to flow through the radiator, thereby

to a certain degree increasing the efficiency of the induced draft, because the fan is thus enabled to function substantially as in the volute passage of a blower.

The temperature control means employed with this apparatus may correspond with that described in my Patent No. 1,256,109.

Variations may be resorted to within the spirit and scope of my said invention, and parts thereof used without others.

I claim:—

1. A temperature control apparatus comprising in a single structure, an air cooled radiator and a heat exchanger, in which latter one liquid flow is adapted to be in communication with the engine jacket, and the other, contiguous, liquid flow is adapted to be in communication with the air cooled radiator.

2. A temperature control apparatus for internal combustion engines comprising a radiator portion having liquid passages and air cooling spaces, an adjacent casing with passages for two separate flows of liquid, means for enabling one of said flows to be circulatory through the engine jacket, and means for enabling the other flow to be circulatory through the passages of the radiator portion, whereby heat exchange is effected between said liquid flows.

3. In a two flow circulatory system for internal combustion engines, a temperature control apparatus comprising an air cooled radiator, a fan therefor, a casing extending rearwardly from said radiator as a guide passage for said fan, an engine jacket, a liquid passage in said casing in communication with said jacket, and another, contiguous, liquid passage in said casing, in communication with said radiator.

Signed at borough of Manhattan in the city, county and State of New York, this 25th day of July, A. D. 1918.

LEON CAMMEN.

Witnesses:

F. W. BARKER,
EDYTHE C. BARKER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."