

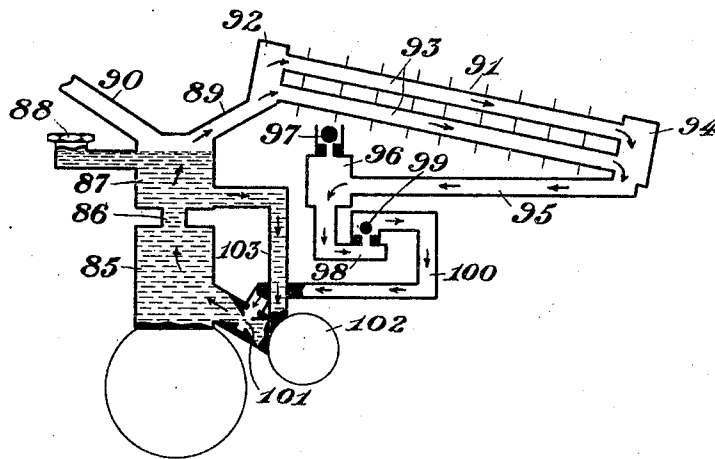
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MEANS FOR OPERATING INTERNAL COMBUSTION ENGINES

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MEANS FOR OPERATING INTERNAL-COMBUSTION ENGINES.

Application filed November 13, 1922. Serial No. 600,637.

This invention relates to cooling systems for internal combustion engines, and has for its object to improve the constructions and procedures heretofore proposed.

With these and other objects in view the invention consists in the novel details of construction and combinations of parts as well as in the novel processes of cooling, all as will be more fully hereinafter disclosed and particularly pointed out in the claims.

Referring to the accompanying drawing forming a part of this specification, 85 represents the jacket of the engine, 87 a tank located above the same, and 86 a connection between said tank and said jacket. 88 represents a filling cap for the tank 87, and 89 and 90 represent passages leading from said tank 87 to the cross-flow radiators 91, only one of which is shown.

The special advantage of a cross flow radiator is disclosed in my copending application Serial No. 582,217, filed August 16, 1922, and entitled Radiators for internal combustion engines. That is, each radiator is provided with a vapor space 92 from which leads a plurality of condensing passages 93 to the tank or receptacle 94 for the condensate and from this receptacle 94 leads the passage 95 to the chamber 96 provided with the valve 97 and from said chamber 96 leads the passage 98 controlled by the valve 99.

The passage 100 joins the passage 98 and leads to the suction side of the Venturi tube 101 to which the pump 102 is connected. From the tank 87 leads the bypass 103 to the suction side of said pump 102. In operation the pump 102 continuously circulates the fluid through the Venturi tube 101, through the jacket 85, through the tank 87, through the passage 103 and back to the suction side of the pump. The Venturi tube in the meantime sucks the condensed fluid from the receptacle 94 through the passage 95 into the receptacle 96, past valve 99 and through the passage 100 back to the jacket 85. This particular cooling system is especially adapted for aeroplanes, for when the demands on the engine are such as to increase the temperature of the water to the point at which vapor is given off in the tank 87, the vapor is drawn through the radiator passages 93

into the circuit just described and past the valve 99 and returned to the jacket. Any air which may be entrapped in the vapor escapes in the tank 96 past the valve 97.

What I claim is:—

1. In a cooling system for internal combustion engines, the combination of a jacket; a tank; a connection between said tank and said jacket; a radiator; a connection between said radiator and said tank; a receptacle into which said radiator empties; a chamber joined to said receptacle; a pump; a restricted connection between said pump and said jacket; and a connection between said last named connection and said chamber.

2. In a cooling system for internal combustion engines, the combination of a jacket; a tank; a connection between said tank and said jacket; a radiator; a connection between said radiator and said tank; a receptacle into which said radiator empties; a chamber joined to said receptacle; a pump; a restricted connection between said pump and said jacket; a connection between said pump and said tank; and a connection between said restricted connection and said chamber.

3. In a cooling system for internal combustion engines, the combination of a jacket; a tank; a connection between said tank and said jacket; means for limiting the level of liquid in said tank; a radiator; a connection between said radiator and said tank; a vapor space associated with said radiator to which said last named connection leads; a receptacle into which said radiator empties; a chamber joined to said receptacle; a pump; a Venturi connection between said pump and said jacket, and a connection between said venturi and said chamber.

4. In a cooling system for internal combustion engines, the combination of a jacket; a tank; a connection between said tank and said jacket; a radiator; a connection between said radiator and said tank; a receptacle into which said radiator empties; a chamber open to the atmosphere joined to said receptacle; a pump; a Venturi connection between said pump and said jacket; and a valved connection between said chamber and said Venturi connection.

5. In a cooling system for internal combustion engines, the combination of a jacket; a tank located above said jacket; a connection between said tank and jacket; a radiator joined to said tank; a pump; a connection provided with a restricted passage between said pump and jacket; a connection between said restricted passage and said radiator; and a connection between said pump and tank.

6. In a cooling system for internal combustion engines, the combination of a jacket; a tank located above said jacket; means to limit the level of liquid in said tank; a connection between said tank and jacket; a radiator joined to said tank above the level of liquid therein; a pump; a connection pro-

vided with a restricted passage between said pump and jacket; a connection between said restricted passage and said radiator; and a connection between said pump and tank.

7. In a cooling system for internal combustion engines, the combination of a jacket; a tank provided with a vapor space located above said jacket; a connection between said tank and jacket; a cross flow radiator joined to said tank; a pump; a connection provided with a restricted passage comprising a Venturi tube between said pump and jacket; a valved connection between said restricted passage and said radiator; and a connection between said pump and tank.

In testimony whereof I affix my signature.
WELLINGTON W. MUIR.