Feb. 1, 1966 L. J. TOLAND 3,232,283

COOLER FOR CRANKCASE OIL PAN OIL

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FIG. 1.

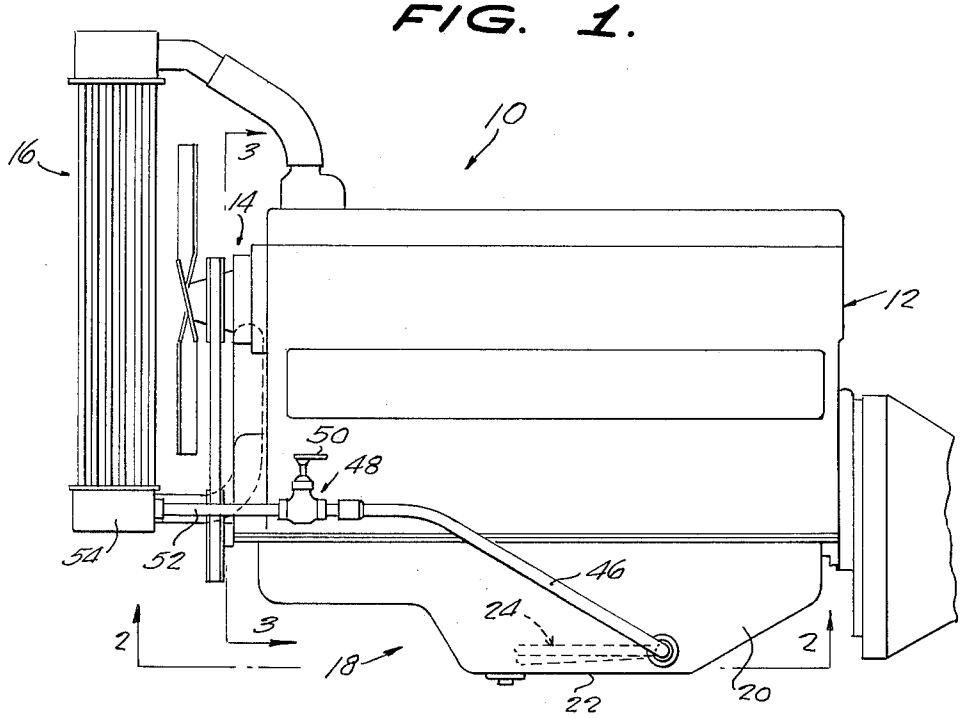
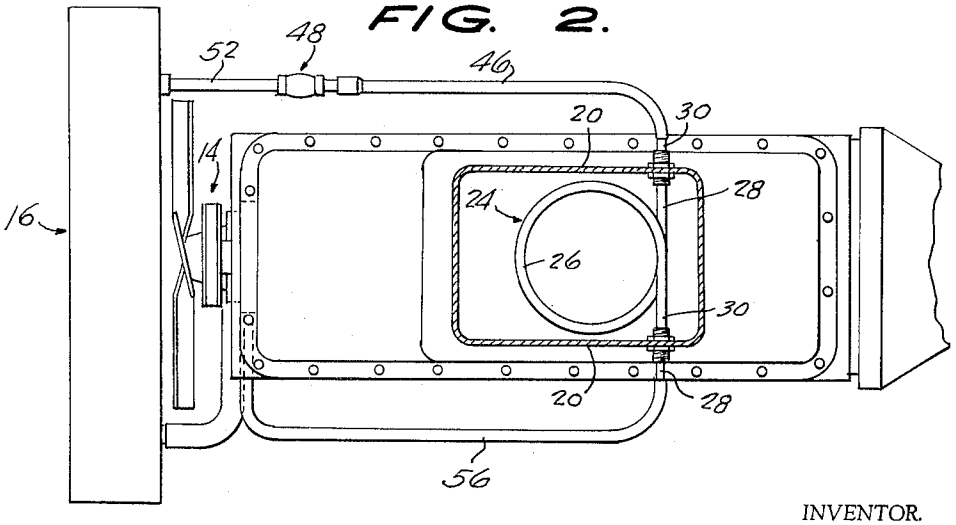


FIG. 2.



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FIG. 3.

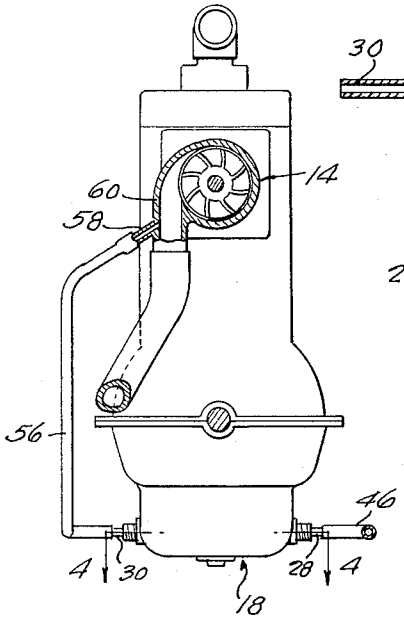


FIG. 4.

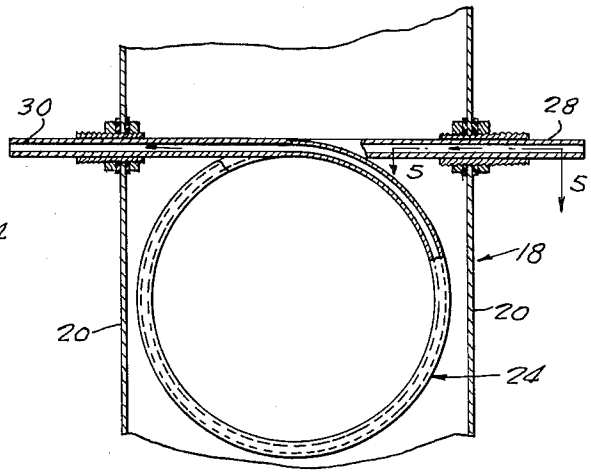
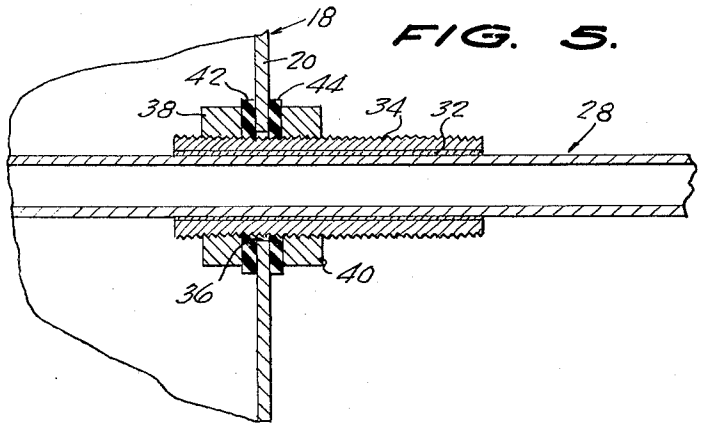


FIG. 5.



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COOLER FOR CRANKCASE OIL PAN OIL

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Filed May 15, 1964, Ser. No. 367,668
3 Claims. (Cl. 123—41.33)

This invention relates to a novel cooler for the oil in the crankcase oil pans of liquid-cooled internal combustion engines, utilizing the coolants of such engines.

The primary object of the invention is the provision of a more effective and efficient, and more adaptable device of the kind indicated, which circulates engine coolant through a cooling coil in an oil pan, from the cooler lower part of the engine cooling radiator, to the existent water pump of the engine.

Another object of the invention is the provision of a simple, relatively inexpensive device of the character indicated above, which is designed to be installed without major or difficult changes in the structure of the oil pan, the radiator, or the water pump.

Other important objects and advantageous features of the invention will be apparent from the following description and the accompanying drawings, wherein, for purposes of illustration only, a specific form of the invention is set forth in detail.

In the drawings:

FIGURE 1 is a left-hand side elevation of an automotive internal combustion engine incorporating a device of the present invention;

FIGURE 2 is a horizontal section taken on the line 2—2 of FIGURE 1;

FIGURE 3 is a vertical transverse section taken on the line 3—3 of FIGURE 1;

FIGURE 4 is an enlarged fragmentary horizontal section taken on the line 4—4 of FIGURE 3; and,

FIGURE 5 is a further enlarged fragmentary section taken on the line 5—5 of FIGURE 4.

Referring in detail to the drawings, the numeral **10** generally designates an internal combustion engine, having a block **12** containing a cooling jacket and having a rotary water pump **14** on its forward end, located behind an upstanding radiator **16**. An oil pan **18** is located beneath the block **12**, and has side walls **20** and intermediate its ends, a bottom wall portion **22**, which is depressed below the remainder of the oil pan **18**.

The illustrated cooling device comprises a circular cooling coil **24** which is disposed horizontally within the oil pan **18**, close to the bottom wall portion **22**. The cooling coil **24** is of a diameter to reach close to the oil pan side walls **20**, and consists of at least one convolution. More than one convolution would be called for by circumstances and by the size of the oil pan and engine.

The cooling coil **24** comprises at least one convolution **26**, which terminates in aligned horizontal first and second or right-hand and left-hand arms **28** and **30**, respectively, which extend through the related side walls **20** of the oil pan, at locations preferably behind the coil. The arms **28** and **30** serve to increase the cooling capacity of the coil.

The arms **28** and **30**, as shown in FIGURES 4 and 5, extend out through tubular gaskets **32**, compressed in externally threaded tubes **34** which extend through holes **36** in the coil pan side walls **20**. Inside and outside packing nuts **38** and **40** are threaded on the tubes **34**, against

inside and outside annular compressible seals **42** and **44**, which are compressed against the inside and outside surfaces, respectively, of the side walls **20**, and seal the holes **36**.

A hose **46** is connected to the left-hand cooling coil arm **28** and leads forwardly and is connected to one side of a regulator valve **48**, having a rotary control handle **50**, for regulating flow of engine coolant to the cooling coil. The other side of the valve **48** is connected by a horizontal pipe **52** to the bottom tank **54** of the engine radiator **16**.

The left-hand cooling coil arm **30** is connected by a hose **56** to a neck **58** formed on the intake pipe **60** of the water pump **14**, as shown in FIGURE 3.

In operation, with the engine **10** running, the water pump **14** draws water or other liquid coolant from the relatively cool bottom tank **54** of the radiator, through the cooling coil **24**, which is immersed in the oil (not shown) in the oil pan **18**, so that the temperature of the oil is reduced, and recirculates this coolant through the cooling system of the engine, in a continuous cycle.

Although there has been shown and described a preferred form of the invention, it is to be understood that the invention is not necessarily confined thereto, and that any change or changes in the structure of and in the relative arrangements of components thereof are contemplated as being within the scope of the invention as defined by the claims appended hereto.

What is claimed is:

1. In an internal combustion engine comprising a cooling jacket, a radiator having a top tank and a bottom tank, the top tank being directly connected to said jacket, a water pump having an intake and an outlet, said outlet being connected to said jacket at a point remote from the connection of the top tank with the jacket, means connecting the intake of the pump to the bottom tank of the radiator, and a crankcase: The improvement of a tubular cooling member supported within the crankcase, said cooling member having a first arm connected to the radiator bottom tank at a point remote from the connection of the pump intake with the bottom tank, said cooling member having a second arm connected to the pump intake.

2. In an internal combustion engine comprising a cooling jacket, a radiator having a top tank and a bottom tank, the top tank being directly connected to said jacket, a water pump having an intake and an outlet, said outlet being connected to said jacket at a point remote from the connection of the top tank with the jacket, means connecting the intake of the pump to the bottom tank of the radiator, and a crankcase: The improvement of a tubular cooling member supported within the crankcase, said cooling member having a first arm connected to the radiator bottom tank at a point remote from the connection of the pump intake with the bottom tank, said cooling member having a second arm connected to the pump intake, said pump intake consisting of an intake pipe directly connected to the bottom tank of the radiator, said intake pump having a sidewall, said second arm of the cooling member being connected to and opening through said sidewall.

3. In an internal combustion engine comprising a cooling jacket, a radiator having a top tank and a bottom tank, the top tank being directly connected to said jacket, a water pump having an intake and an outlet, said outlet

being connected to said jacket at a point remote from the connection of the top tank with the jacket, means connecting the intake of the pump to the bottom tank of the radiator, and a crankcase: The improvement of a tubular cooling member supported with the crankcase, said cooling member having a first arm connected to the radiator bottom tank at a point remote from the connection of the pump intake with the bottom tank, said cooling member having a second arm connected to the pump intake, said pump intake consisting of an intake pipe directly connected to the bottom tank of the radiator, said intake pump having a sidewall, said second arm of the cooling

member being connected to and opening through said sidewall, said second arm being substantially smaller in diameter than the pump intake pipe.

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