May 10, 1932. F. B. RENTZ 1,857,767

HEATER FOR COOLING LIQUIDS OF INTERNAL COMBUSTION ENGINES

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Fig. 1

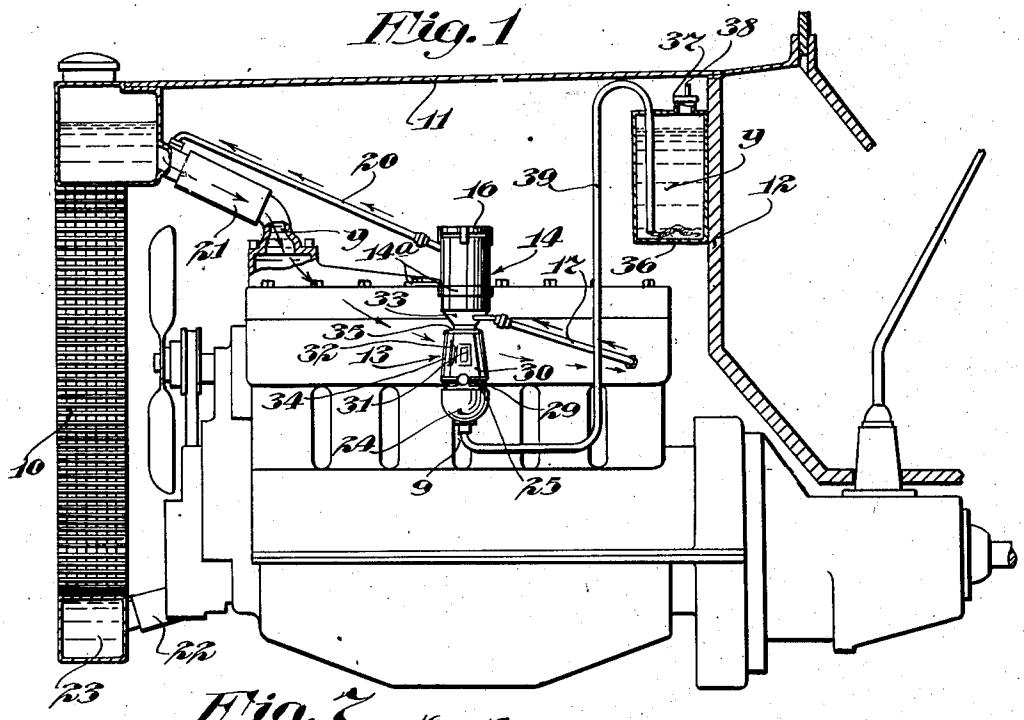

Fig. 2

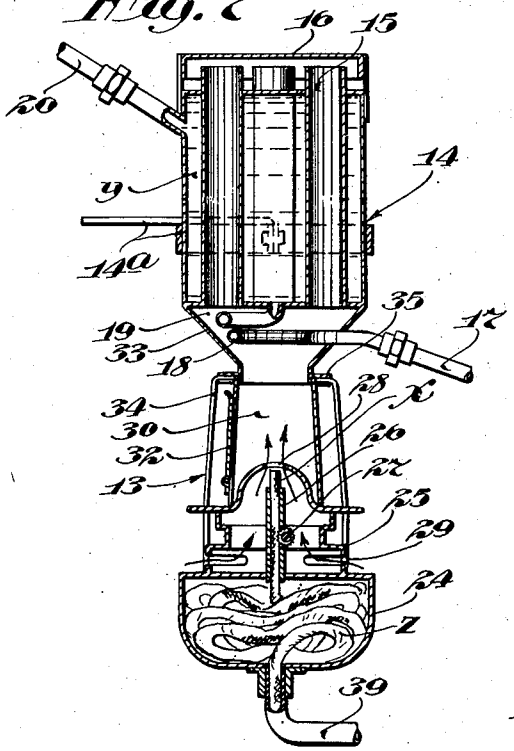

Fig. 8

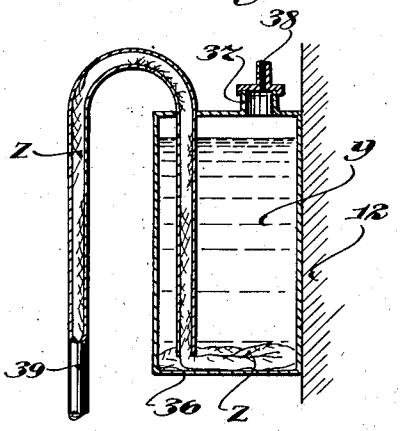

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Fig. 4

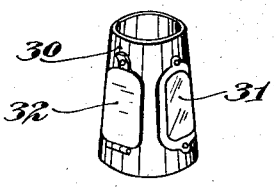


Fig. 3

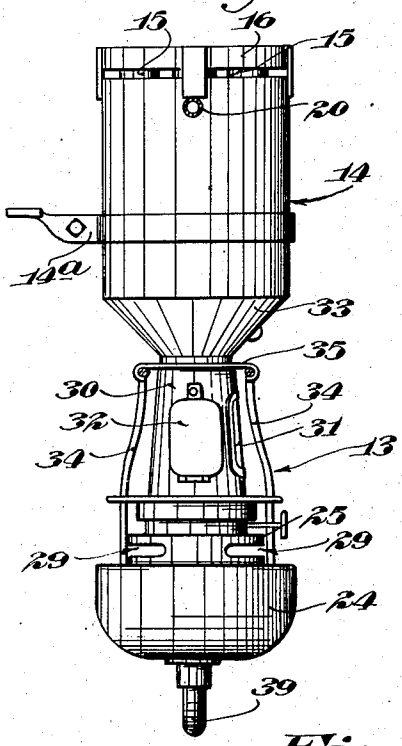


Fig. 2

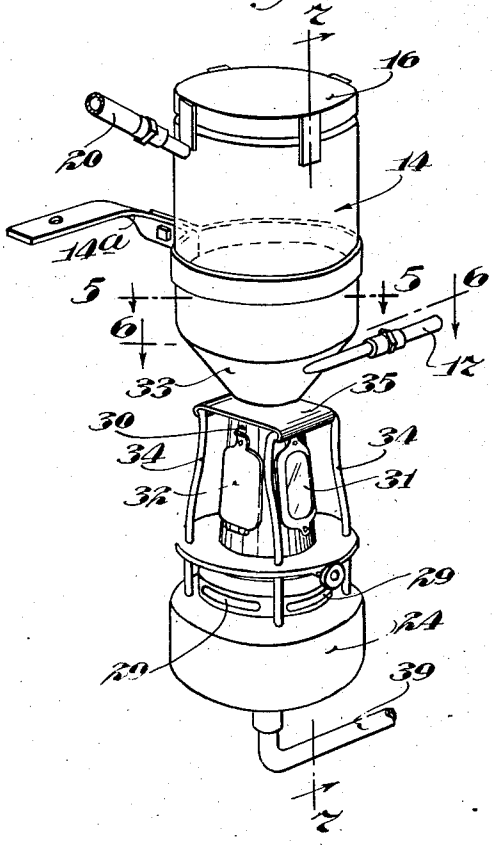


Fig. 5

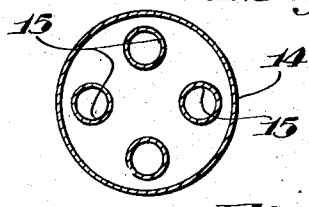
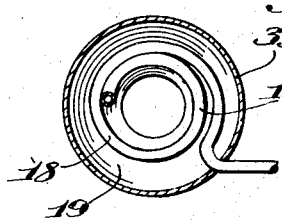


Fig. 6



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Patented May 10, 1932

1,857,767

UNITED STATES PATENT OFFICE

FRANK B. RENTZ, OF YANKTON, SOUTH DAKOTA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO GLEN V. PICKETT, OF YANKTON, SOUTH DAKOTA

HEATER FOR COOLING LIQUIDS OF INTERNAL COMBUSTION ENGINES

Application filed December 16, 1929. Serial No. 414,372.

My present invention has for its object the provision of a simple and highly efficient heater for the cooling system of an internal combustion engine for an automobile or the like to cause a circulation of the liquid in said system when the automobile is parked or standing in a cold garage to keep the engine and its lubricant warm to facilitate the starting and operation of the engine.

To the above end, generally stated, the invention consists of the novel devices and combinations of devices hereinafter described and defined in the claims.

In the accompanying drawings, which illustrate the invention, like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a fragmentary view partly in longitudinal central section and partly in side elevation showing the front end portion of an automobile and its engine;

Fig. 2 is a perspective view of the heater removed from the engine, on an enlarged scale;

Fig. 3 is a front elevation of the parts shown in Fig. 2;

Fig. 4 is a perspective view of the chimney removed from the lamp;

Fig. 5 is a detail view in section taken on the line 5—5 of Fig. 2;

Fig. 6 is a view principally in section taken on the line 6—6 of Fig. 2;

Fig. 7 is a view partly in elevation and partly in section taken on the line 7—7 of Fig. 2; and

Fig. 8 is an enlarged view of the fuel supply tank, as shown in Fig. 1.

Of the parts of the automobile illustrated, it is only necessary to note at this time the engine 9, radiator 10, hood 11, and cowl 12.

The heater illustrated is an oil or kerosene lamp 13 which is held suspended under a vertical boiler 14, rigidly secured to a bracket 14^a in the head of the engine 9 at the left side thereof in any suitable manner. A plurality of circumferentially spaced draft tubes or flues 15, extend completely through the boiler 14 and are covered by a cap 16 that is spaced thereabove and attached to said boiler. The cooling medium or fluid for the engine 9, hereafter referred to as water, is conveyed to the boiler 14 from that portion of the water chamber surrounding the cylinders of the engine 9 through an upwardly inclined intake pipe 17. One end of this pipe 17 is tapped into the water jacket of the block of the engine 9 at the rear end thereof and at an elevation considerably below the boiler 14. The other or upper end of the pipe 17 has communication with the boiler 14 at the bottom thereof, through a coil pipe 18 in an open bottom upwardly flaring compartment 19 below said boiler.

Cold water from the water compartment of the engine 9 is delivered into the boiler 14 at the bottom thereof and the hot water from said boiler is conveyed through a pipe 20 to the connection 21 between that part of the water chamber in the head of the engine 9 and the top tank of the radiator 10. The delivery end of the pipe 20 is considerably above the intake end thereof so that the pipe 20 has substantially the same grade as the pipe 17. The circulation of water, when first heated, is substantially as indicated by arrows in Fig. 1, and as the water is heated in the boiler 14 it will rise in the intake pipe 20, flow into the connection 21, and from thence it is returned to the intake end of the pipe 20 through that portion of the water chamber in the head and block of the engine.

As the water becomes hotter in the circulating course, indicated by arrows, the water in the radiator 10 is heated and thereafter the circulation of water gradually changes from the course indicated and flows from the delivery end of the pipe 20, through the radiator 10, connection 22, between the bottom tank of said radiator and the water chamber in the block of the engine 9.

As previously stated, the heater is in the form of an oil lamp and of the parts thereof, it is important to note the bowl 24, burner 25, wick holder 26, wick raising or lowering wheel 27, wick or flame passage 28, fresh air intake ports 29, wick X, chimney 30 having a sight opening 31 closed by a piece of mica, and a normally closed match opening 32 through which the wick X may be lighted. The passage of air for the proper combustion

of the wick X and oil therein is indicated by arrows in Fig. 2, and the proper draft therefore is produced through the chimney 30, compartment 19 and flues 15.

The heater 13 is detachably held suspended under the upwardly flaring shell 33 forming the compartment 19 by a pair of diametrically opposite bails 34 permanently attached to the burner 25 outward of the chimney 30, and a pair of wide hooks 35 on the shell 33 with which the transverse portion of said bails interlock. This shell 33 caps the chimney 30 so that heat generated by the burner passes through the chimney 30, compartment 19 around the coil pipe 18, through the flues 15 which are surrounded by the water in the boiler 14 and any remaining heat will escape from said flues under the cap 16 and heat the air under the hood 11 which surrounds the engine 9. The water, before entering the boiler 14, is preheated in the coil pipe 18 and the primary object thereof is to prevent condensation on the outside of the boiler 14.

Kerosene or other liquid fuel Y is carried in a supply tank 36 secured to the cowl 12 under the hood 11 and at an elevation considerably above the heater 13. This tank 36 is provided with a normally closed filling opening 37 having a vent pipe 38 which prevents the loss of the fuel Y in case of splashing. A siphon-acting tube 39, the short arm of which leads from the tank 36 near the bottom thereof upward through the top of said tank and the long arm of said tube leads from the tank 36 to the bowl 24. Within the siphon-acting tube 39 is a long wick Z through which the liquid fuel Y is conveyed to the wick X. The receiving end portion of the wick Z rests on the bottom of the tank 36 and the other end thereof is coiled within the bowl 24 and in contact with the lower end portion of the wick Z where the fuel is conveyed by capillary connection to the wick Z.

What I claim is:

1. The combination with an internal combustion engine and a cooling system therefor including a liquid chamber surrounding the cylinders of the engine, a radiator and upper and lower conduits between said chamber and radiator, of means for heating the liquid in said system to cause a circulation thereof including a boiler having a draft flue and a heating compartment below said flue, a coiled pipe in said compartment leading from said chamber to the boiler, a conduit leading from the boiler to said system, and an oil lamp below said compartment and having a chimney leading thereto for heating the coil pipe and boiler, said chimney, compartment, and draft flue forming a continuous closed passageway from the lamp to atmosphere above the boiler.

2. The combination with an internal combustion engine and a cooling system therefor including a liquid chamber surrounding the cylinders of the engine, a radiator and upper and lower conduits between said chamber and radiator, of means for heating the liquid in said system to cause a circulation thereof including a boiler having intake and outlet connectons with said system for the crculation of the liquid therethrough, an oil lamp for heating the boiler, an oil supply tank above the oil lamp, and a siphon-acting conduit leading from the tank to the bowl of the lamp, said lamp having a wick extending through the siphon-acting conduit and into the supply tank.

3. The combination with an internal combustion engine and a cooling system therefor including a liquid chamber surrounding the cylinders of the engine, a radiator and upper and lower conduits between said chamber and radiator, of means for heating the liquid in said system to cause a circulation thereof including a boiler having intake and outlet connections with said system for the circulation of the liquid therethrough, an oil lamp for heating the boiler, an oil supply tank above said lamp, a siphon-acting conduit leading from said tank to the bowl of the lamp, and a wick in the siphon-acting conduit the receiving end of which is on the bottom of the tank and the delivery end of which is on the bottom of the bowl of the lamp and in contact with the wick of said lamp.

4. The combination with an internal combustion engine and a cooling system therefor including a liquid chamber surrounding the cylinders of the engine, a radiator and upper and lower conduits between said chamber and radiator, of means for heating the liquid in said system to cause a circulation thereof including a boiler having intake and outlet connections with said system for the circulation of the liquid therethrough, said boiler having a plurality of spaced upright draft flues, a cap covering the upper ends of the flues and spaced thereabove, a shell forming an extension of the lower end of the boiler and affording a compartment into which the lower ends of the draft tubes open, a coiled pipe in said compartment one end of which leads from said chamber and the other end of which is arranged to deliver into said boiler, a conduit leading from the boiler to said system, and an oil lamp suspended under said compartment and having a chimney opening into the compartment at the bottom thereof.

5. The structure defined in claim 4 in which the lamp is detachably suspended from said shell.

In testimony whereof I affix my signature.

FRANK B. RENTZ.