N. E. HILDRETH.

COOLING SYSTEM FOR ENGINES.

APPLICATION FILED SEPT. 2, 1919.

1,357,981.

Patented Nov. 9, 1920.

2 SHEETS—SHEET 1.

Fig. 1.

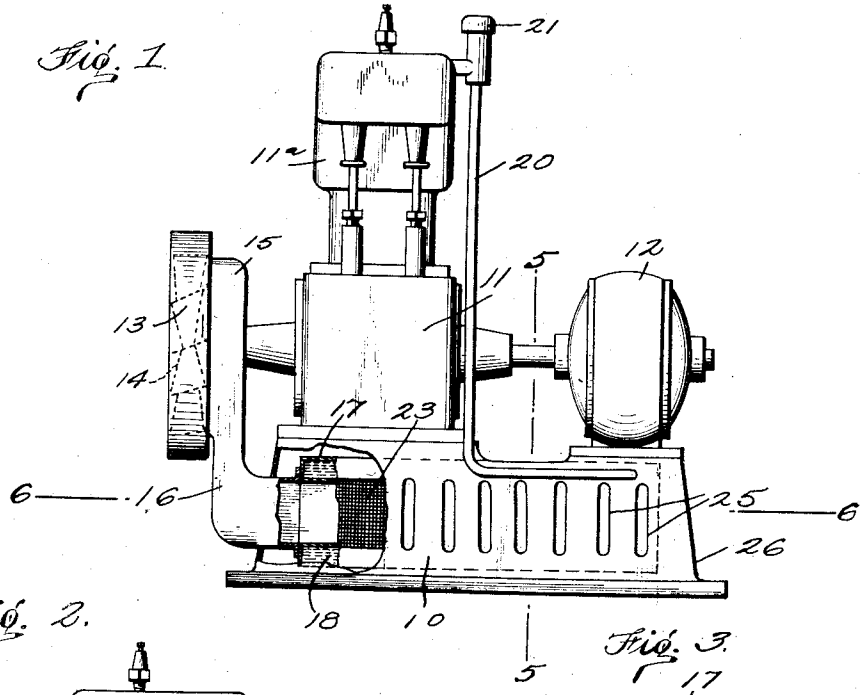


Fig. 2.

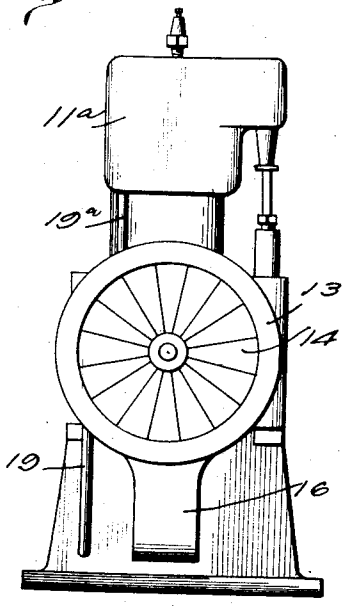


Fig. 3.

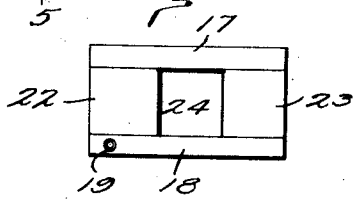
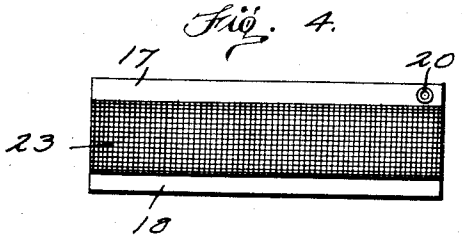


Fig. 4.



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2 SHEETS—SHEET 2.

Fig. 5

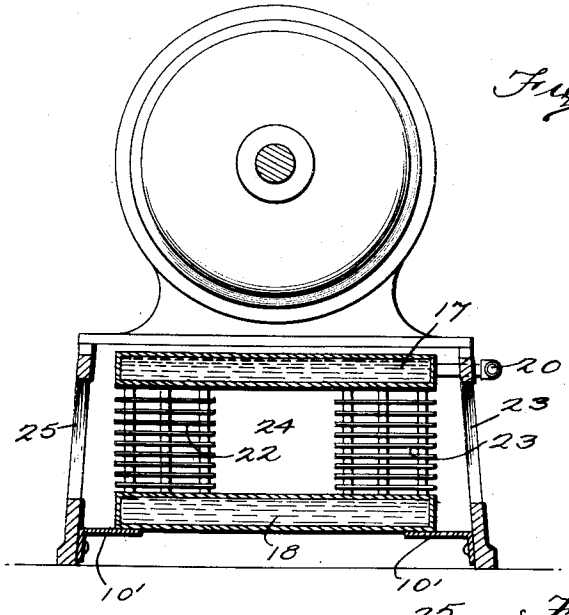


Fig. 7.

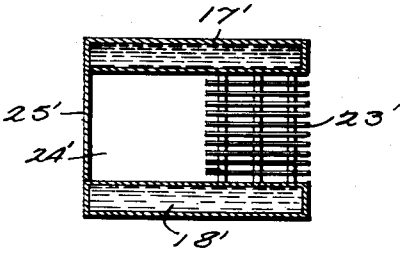
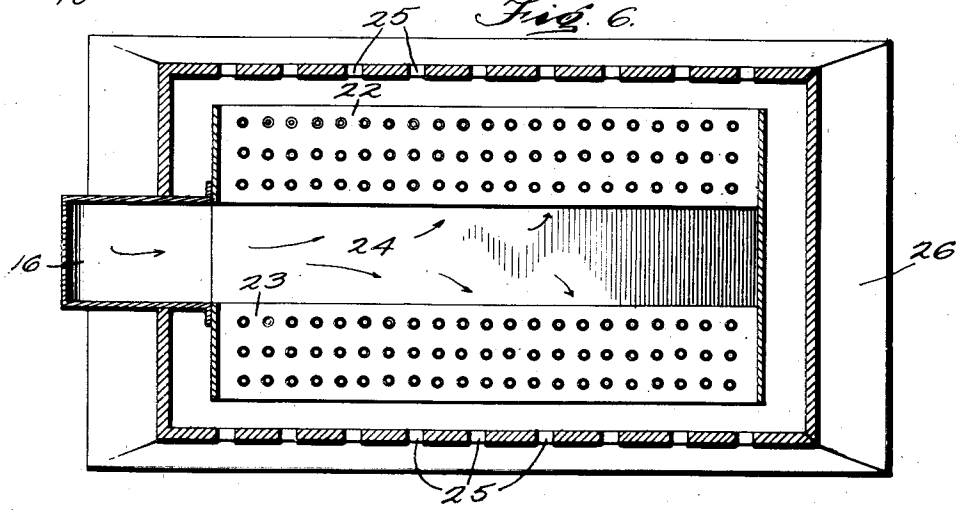


Fig. 6.



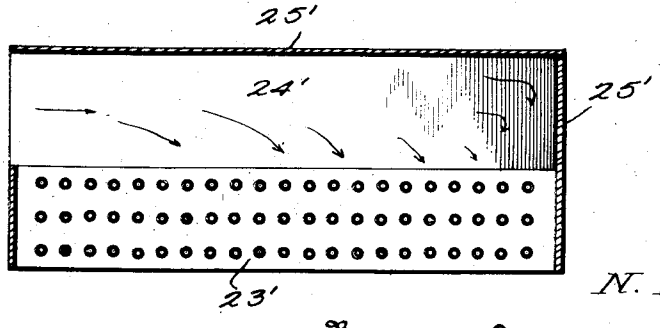


Fig. 8.

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UNITED STATES PATENT OFFICE.

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COOLING SYSTEM FOR ENGINES.

1,357,981. Specification of Letters Patent. Patented Nov. 9, 1920.

Application filed September 2, 1919. Serial No. 321,202.

To all whom it may concern:

Be it known that I, NED E. HILDRETH, a citizen of the United States, residing at Lincoln, in the county of Lancaster and State of Nebraska, have invented certain new and useful Improvements in Cooling Systems for Engines, of which the following is a specification.

This invention relates to new and useful improvements in cooling systems for engines, and more particularly to cooling systems for engines of the stationary type while not necessarily restricted to this use.

An important object of the invention is to provide means for housing the radiator used for cooling the circulation water of the engine.

As ordinarily used in such engines the liquid cooling medium, such as water or oil, is stored in a tank or a radiator located near the engine and circulated around the cylinder in the water jacket by means of a pump or by the action of the heat of combustion, or what is commonly known in the industry as the thermosiphon system. While these methods are effective, inasmuch as the tanks or radiators are located apart from the engines they are inconvenient and cumbersome and being unprotected are liable to damage, and being exposed accumulate dirt in the cooling medium or in the cells of the radiator.

My invention overcomes these objections by utilizing a space hitherto seldom used in this class of motors. I place the cooling radiator within the walls of the base or sub-base of the engine where it is out of the way and protected from injury and dirt, and being thus hidden from view makes a much neater and more compact installation, features which are especially valuable in that class of motors used for domestic purposes, such as light power around the home or farm, or suburban or farm house lighting, although its uses are by no means confined to such purposes.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification, and in which like numerals are employed to designate like parts throughout the same:

Figure 1 is a side elevation of a generating set of the usual construction embodying my invention;

Fig. 2 is an end elevation thereof;

Fig. 3 is an end elevation of the radiator;

Fig. 4 is a side elevation thereof;

Fig. 5 is an enlarged section taken on line 5—5 of Fig. 1;

Fig. 6 is an enlarged section taken on line 6—6 of Fig. 1, and,

Figs. 8 and 7 are sections taken through a slightly modified form of radiator.

Referring now more particularly to the drawings, numeral 10 indicates the base of the engine. Mounted upon this base is an internal combustion engine 11, which drives a generator 12, also mounted upon the base.

The numeral 13 indicates the fly wheel of the engine. In the present instance this fly wheel is illustrated as being provided with radial spokes 14, so shaped as to form the blades of the fan. While I have shown this fan as being formed integrally with the fly wheel, I do not limit myself to this construction, as the fan may be of the usual type and driven by a belt from some moving part.

Arranged directly in the rear of the fan is a hood 15, which communicates with a conduit 16, leading into the forward end of the engine base 10.

The base 10 is of hollow construction and mounted upon suitable supports 10′, within the base, is a radiator. The radiator comprises upper and lower reservoirs 17 and 18, respectively. The lower reservoir 18 communicates by pipes 19 and 19ª with the lower end of the water jacket 11ª of the engine, and the upper reservoir 17 communicates by a pipe 20 with the upper end of the water chamber 11ª. If desired, the pipe 20 may be provided at its upper end with a filling cap 21.

Connecting the upper and lower reservoirs 17 and 18 are banks of cellular or tubular passages 22 and 23, affording between the banks, a passage 24, with which the conduit 16 communicates. The rear end of the passage 24 is closed, as shown in Fig. 6. The sides of the base 10 are provided with openings 25, allowing escape of the air, as shown in Fig. 4.

In Figs. 7 and 8, I have shown a slightly modified form of radiator in which the reservoirs 17′ and 18′ are connected by a single bank of passages 23′. The passage 24′ lies between the two reservoirs and is provided with side and end walls 25′ and 26′ respectively.

If desired, the end 26 of the base may be made removable to allow of inspection or repair of the radiator, or either side of the base may be made removable for this purpose.

The operation of my device is as follows: The engine having been started, in the usual manner, water is drawn from the radiator through the pipe 19 by a circulation pump (not shown) and forced through pipe 19ª into the water jacket, circulating therethrough, and returning by pipe 20 to the reservoir 17 of the radiator. It then passes through the passages of the cellular or tubular construction to the lower reservoir 18, whence it is taken by the pump and again circulated, as is well known. While this action is taking place, the rotation of the fan has set in motion a current of air which is received by the hood, 15, conducted through the conduit 16 to the passage 24 of the radiator, passing out through the cellular passages, and the openings 25, formed in the base, to the open air, cooling the water in so doing.

It is to be understood that the forms of my invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:

1. In a device of the type described, the combination with a water jacketed internal combustion engine mounted upon a hollow base, of a radiator removably mounted within said base and connected with the water jacket of said engine, and means for forcing a current of air through said radiator operated by said engine.

2. In a device of the type described, the combination with a water jacketed internal combustion engine mounted upon a hollow base having one removable side, of supports formed within said base, a radiator removably mounted within said base upon said supports and connected with the water jacket of said engine, and means for forcing a current of air through said radiator operated by said engine.

3. In a device of the type described, the combination with a water jacketed internal combustion engine mounted upon a hollow base, of a radiator connected with the water jacket disposed within said base, said radiator having spaced banks of passages, said spaced banks affording a central passage, and means for forcing a current of air into said central passage and through said passages.

4. In a device of the type described, the combination with a water jacketed internal combustion engine mounted upon a hollow base, of a radiator mounted within said base having upper and lower reservoirs connected with a water jacket of the engine, a central passage formed in said radiator, means for supplying a current of air to said passage, openings formed in said base, and banks of passages connecting said upper and lower reservoirs intermediate said central passage and the openings formed in said base.

5. In a device of the type described, the combination with a water jacketed internal combustion engine mounted upon a hollow base, of a radiator mounted in said base, having upper and lower reservoirs connected with the water jacket of the engine, a central passage formed in said radiator, means for supplying a current of air to said passage, comprising a fan, means for rotating said fan, a hood adapted to receive the current of air from said fan, and a conduit connecting said hood and said passage, openings formed in said base, and banks of passages connecting said upper and lower reservoirs intermediate said central passage and the openings formed in said base.

6. In a device of the type described, the combination with a water jacketed internal combustion engine mounted upon a hollow base, having one removable side, of a radiator having a passage therein mounted within said hollow base, means actuated by the operation of said engine for supplying air to said passage, openings formed in said base and banks of passages forming a portion of said radiator disposed intermediate said central passage and said openings.

In testimony whereof I affix my signature in presence of two witnesses.

NED E. HILDRETH.

Witnesses:
W. D. Gay, Jr.,
V. Samuels.