T. W. SAPPER.

COOLING SYSTEM FOR GAS ENGINES.

APPLICATION FILED OCT. 22, 1918.

1,315,423.

Patented Sept. 9, 1919.

2 SHEETS—SHEET 1.

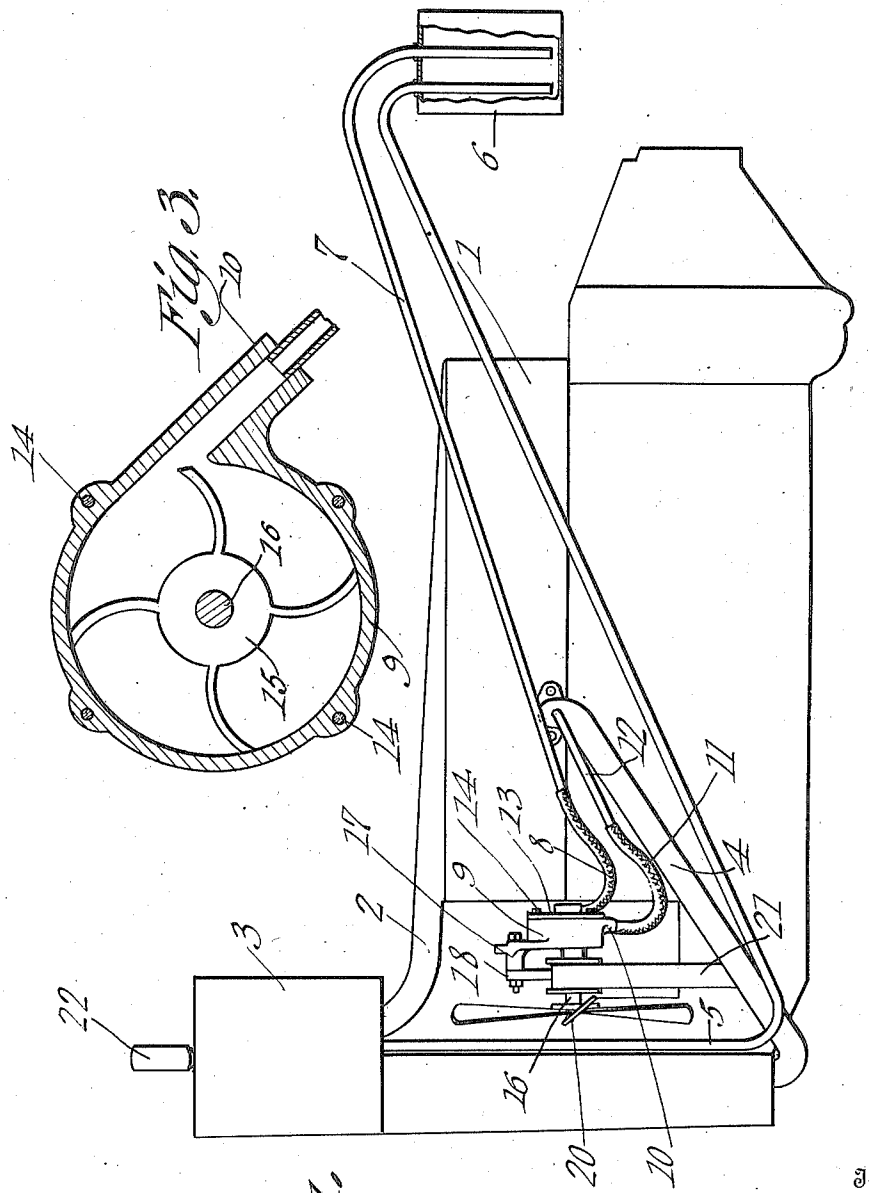


Fig. 3.

Fig. 1.

Witness

Inventor

T. W. Sapper

By Cabrow & Co.

Attorneys

T. W. SAPPER.

COOLING SYSTEM FOR GAS ENGINES.

APPLICATION FILED OCT. 22, 1918.

1,315,423.

Patented Sept. 9, 1919.

2 SHEETS—SHEET 2.

Fig. 4.

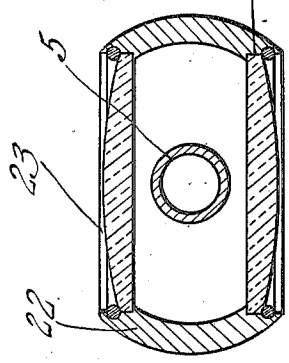
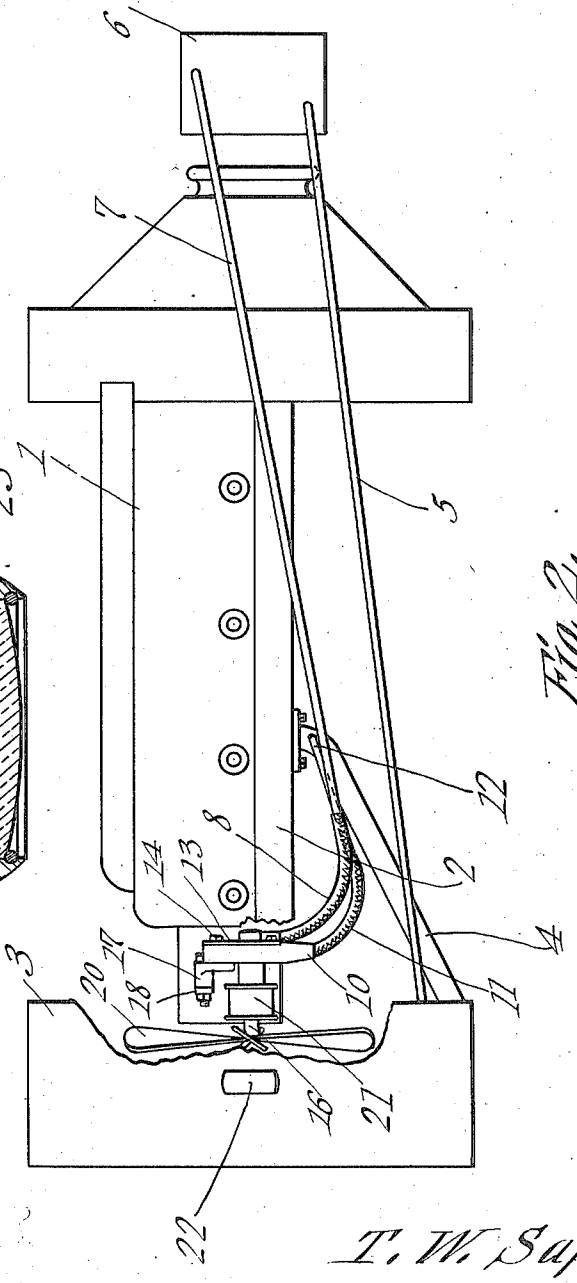


Fig. 2.



Witness

J. R. Toulin

Inventor

T. W. Sapper

By C. A. Snow & Co.

Attorneys

UNITED STATES PATENT OFFICE.

THEODORE W. SAPPER, OF HERMISTON, OREGON.

COOLING SYSTEM FOR GAS-ENGINES.

1,315,423. Specification of Letters Patent. Patented Sept. 9, 1919.

Application filed October 22, 1918. Serial No. 259,211.

To all whom it may concern:

Be it known that I, THEODORE W. SAPPER, a citizen of the United States, residing at Hermiston, in the county of Umatilla and State of Oregon, have invented a new and useful Cooling System for Gas-Engines, of which the following is a specification.

The subject of this invention is a cooling system for gas engines and relates to water cooling systems.

The main object of the invention is the provision of a cooling system which will properly circulate the water to prevent overheating of the engine.

Another object of the invention is the provision of a pump for circulating the water.

Another object of the invention is the provision of means for supporting the pump.

The invention also contemplates generally improving the construction and enhancing the utility of engine cooling systems.

With the foregoing and other objects in view, which will appear as the description proceeds, the invention resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes in the precise embodiment of the invention herein disclosed can be made within the scope of what is claimed without departing from the spirit of the invention.

A practical structure for carrying out the invention is illustrated in the accompanying drawings, wherein:—

Figure 1 is a view in side elevation of an engine equipped with a cooling system constructed in accordance with the invention;

Fig. 2 is a plan view of the same, parts broken away;

Fig. 3 is an enlarged detail sectional view of the pump;

Fig. 4 is an enlarged detail of the radiator cap, showing the same in horizontal section.

Referring to the drawings by numerals of reference:—

An ordinary form of gas engine is indicated by the numeral 1, and the upper portion of the water jacket thereof is in communication, through the pipe 2, with the radiator 3, while the lower portion of the water jacket communicates, through the pipe 4, with the lower portion of the radiator 3.

An overflow pipe 5 is provided in the radiator 3, the upper opened end of which is positioned in the radiator cap so that, when the water rises in the radiator, through expansion of the water under heating, it will flow into the open mouth of this pipe. The overflow pipe 5 leads from the radiator 3 to a water tank 6, which may be situated under the rear seat of the motor vehicle, or in other suitable location, and any sudden rise of the water in the radiator will set up a siphoning action in the pipe 5 to quickly carry the water to the tank 6.

An outlet pipe 7 leads from the tank 6, and in this pipe may be inserted a section 8 of flexible piping, so as to give sufficient flexibility to the pipe. The flexible pipe 8 is connected to the intake of a pump 9, preferably of the rotary form, and this pump is formed with an outlet nipple 10, which is connected by a section of flexible piping 11 to a pipe 12, the end of which is tapped into the pipe 4, so that water may be delivered from the pump to the water jacket of the engine.

The casing of the pump 9 is closed by a cap 13, which is detachably secured to one face thereof and secured in place thereon by bolts 14 or otherwise. Within the casing is a rotor 15, rigid on a shaft 16 which is journaled in the casing and one end of which extends forwardly of the casing.

A hanger bracket 17 is formed integral with the pump casing, or may be otherwise attached thereto, and this bracket is apertured to receive a bolt or the like by which it is secured to the usual fan bracket 18.

A pulley 19 is rigid on the forwardly extending portion of the shaft 16, and a fan 20 is keyed or otherwise securely fastened on the forward end of the shaft. The usual fan belt 21 passes over the pulley 19 and serves to drive the pump and fan.

The radiator 3 is preferably supplied with a cap 22 which is formed with diametrically opposed apertures 23, which apertures are closed by glass lenses or windows so that the operator of the vehicle may see the circulation of the water into the open mouth of the pipe 5, and so judge of the proper working of the system.

The operation is as follows:—The radiator and water jacket are filled with water in the usual way, and water may be also supplied in the tank 6. When the engine is running, the heat developed by the engine is radiated to the water, causing a rise in the temperature of the water. This will cause the hot water to rise through the pipe 2 to

the upper portion of the radiator 3, where, on becoming cooler, it will gravitate to the lower portion of the radiator and back through the pipe 4 to the water jacket of the engine, thus setting up a circulation of the water.

While the circulation just described is taking place, the pump 9 will be drawing cold water from the tank 6 and delivering it, through the pipe 12 to the water jacket of the engine, thus further lowering the temperature of the water supplied to the water jacket. The hottest water, which will rise into the radiator cap 22, will flow through the pipe 5 to the tank 6. As these parts are exposed to the air and far removed from the engine heat, the water will be reduced to normal atmospheric temperature before being again delivered to the water jacket of the engine.

From the foregoing it will be seen that all danger of the water boiling and the engine becoming overheated is greatly lessened, if not entirely overcome.

What I claim as my invention is:—

In a cooling system for automobiles, the combination with the water jacket of an engine and a radiator communicating therewith, of a pump operated by the engine, a discharge pipe leading from the pump and into the water jacket supply pipe of the engine, a water supply tank disposed above and adjacent the engine and arranged at a greater height than the pump, a pipe leading from the tank disposed at an angle and leading to the pump to supply cool water to the pump to be forced to the water jacket of the engine, and a pipe having one end extended vertically and disposed rearwardly of the radiator and communicating with the upper end of the same, the major portion of the pipe being extended in a plane parallel to the second mentioned pipe and extended into the tank to supply the water to be cooled to the tank.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

THEODORE W. SAPPER.

Witnesses:

J. T. HINKLE,

H. M. ADAMS.