

R. HUFF.
 WATER COOLING SYSTEM FOR HYDROCARBON ENGINES.
 APPLICATION FILED MAY 20, 1907.

1,028,115.

Patented June 4, 1912.

2 SHEETS—SHEET 1.

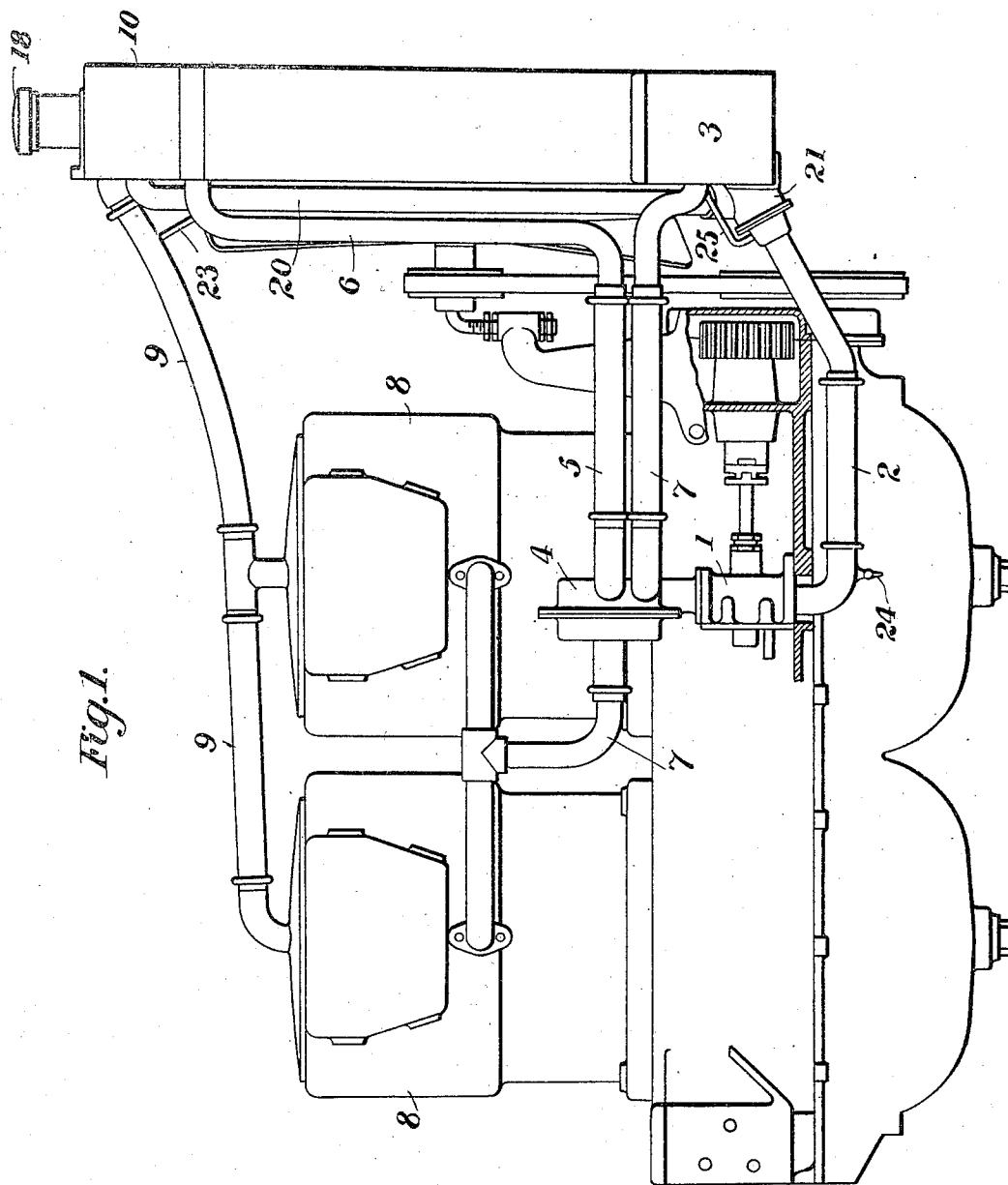


Fig. 1.

Witnesses

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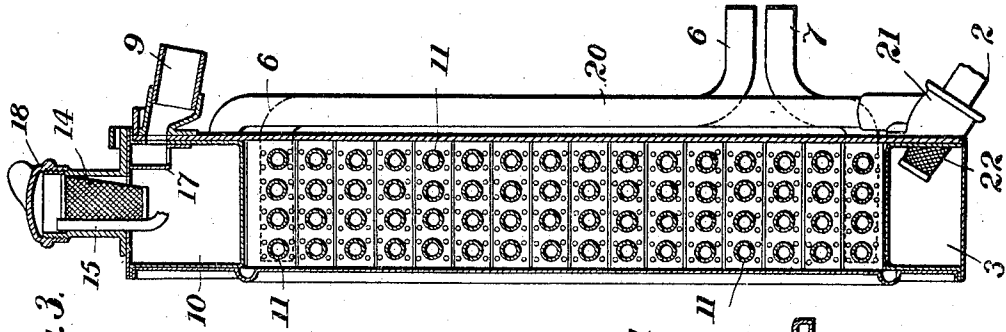


Fig. 3.

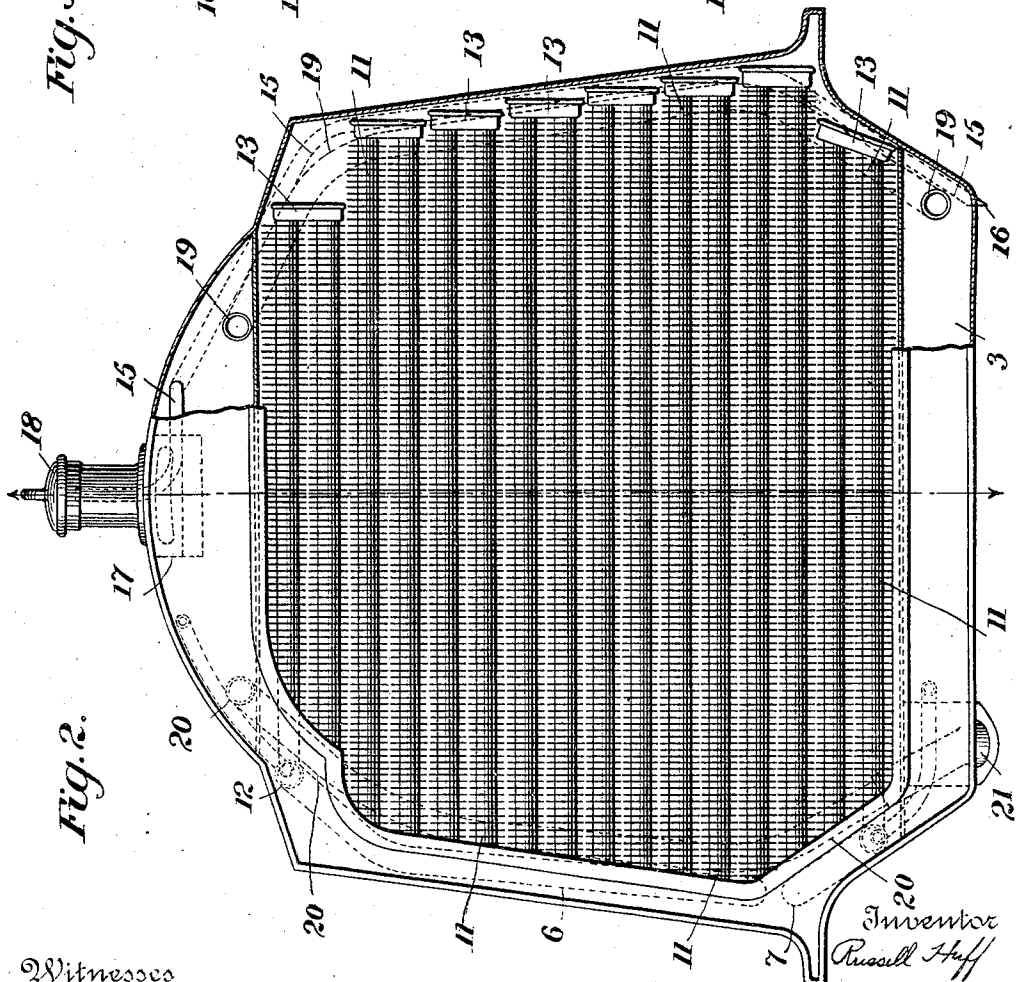


Fig. 2.

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UNITED STATES PATENT OFFICE.

RUSSELL HUFF, OF DETROIT, MICHIGAN, ASSIGNOR, BY MESNE ASSIGNMENTS, TO
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WATER-COOLING SYSTEM FOR HYDROCARBON-ENGINES.

1,028,115.

Specification of Letters Patent.

Patented June 4, 1912.

Application filed May 20, 1907. Serial No. 374,664.

To all whom it may concern:

Be it known that I, RUSSELL HUFF, a citizen of the United States, and resident of Detroit, Wayne county, State of Michigan, have invented certain new and useful Improvements in Water-Cooling Systems for Hydrocarbon-Engines, of which the following is a specification.

The present invention relates to improvements in the cooling systems for the explosive engines of motor vehicles and has for its object to provide a system, the parts of which shall be compactly arranged and so related as to secure a more effective cooling action than has been possible with the systems heretofore proposed.

A further object of the invention is to provide a radiator for such a cooling system which shall be very durable and which will provide a maximum amount of radiating surface without undesirably increasing the size or weight of the device.

In the accompanying drawings, Figure 1 is a diagrammatic view of a cooling system constructed in accordance with the present invention and applied to an engine having two explosive chambers; Fig. 2 is a front elevation and partial section of the radiator; Fig. 3 is a vertical sectional view through the radiator.

Referring to the drawings, 1 designates a pump of any suitable construction by which, when the engine is in operation, water is circulated through the cooling system, said pump being connected by a pipe 2 with a supply tank 3. From the pump 1 the water is forced through a governor 4 into a pipe 5 which is connected with the inlet pipe 6 of the radiator which will be more particularly described hereinafter. The outlet from the radiator is connected through a pipe 7 with the water jackets of the engine cylinders 8 and the latter are connected through a pipe 9 with a supplemental tank 10 which is in turn connected with the tank 3, as will be hereinafter more particularly described.

It will be noticed that according to the present invention the radiator is arranged between the pump and the water jacket of the engine cylinders and thereby the pump is caused to positively force the water through the radiator and also to provide a maximum pressure within the governor 4.

This governor is preferably of the character shown in my prior application Serial No. 282,844.

The radiator comprises a plurality of series of horizontally arranged tubes 11 each having a relatively large number of radially projecting fins; and said tubes are so arranged and connected that a maximum amount of radiating surface is provided. As shown there are four tubes 11 in each series and the inlet pipe 6 is connected directly with the upper series of said tubes through a manifold 12. At their opposite ends said upper series of tubes 11 are connected by a junction box 13 with the tubes of the next lower series and the latter in turn are connected at their other ends, by a similar connection, with the tubes of the third series. This connection of the series of tubes alternately at opposite sides of the radiator causes the water to circulate back and forth through all of the series of tubes before reaching the radiator discharge outlet or pipe 7.

The heated water passing through the pipe 9 from the jackets of the engine cylinders enters the supplemental tank 10 at a point above the water line therein. Within said supplemental tank is arranged a strainer 14 and said tank is also provided with an overflow pipe 15 which extends therefrom along the outside of the radiator to the lower end thereof, this discharge opening being indicated at 16. The water entering the tank at 10 sometimes contains considerable steam and the latter separates in said chamber from the water and escapes through the pipe 15 to the atmosphere. To prevent splashing or the passage of water into the pipe 15, and to assist in the separation of the steam and water, a baffle 17 is arranged within the tank 10 in line with the pipe 9. The upper end of the tank 10 is closed by a suitable removable cap 18. The water in the tank 10, from which the steam has been separated as above described, passes to the lower tank 3 through two pipes 19, 20, extending along opposite sides of the radiator. The pipe 19 empties directly into the tank 3, while the pipe 20 is connected with the outlet casting 21 to which the pump supply pipe 2 is connected. A suitable strainer 22 is arranged within the tank 3 at the entrance to the pipe 2.

The radiator is also provided with a vent 23 which connects pipes 6 and 9, the latter being as before described, in communication with the atmosphere through the supplemental tank 10 and overflow pipe 15.

In order that the entire system may be drained when desired, a drain cock 24 is provided in the pipe 2 and the latter is connected through a branch 25 with the lowest point in the pipe 7. The pipes 23 and 25 are of such small diameter that they do not materially impair the circulation of water through the system.

It will be noticed that by this invention all of the parts of the system are compactly arranged, the radiator being mounted on the main supply tank 3 and the steam separator or supplemental tank 10 being supported by and forming part of the radiator. By this arrangement it is possible to effect a material saving both as regards the weight of the parts and the cost of manufacturing the same. It will be noticed that when in use there is a circulation of water through every part of the system, that is, the water circulates through both the main and supplemental tanks as well as the radiator and several pipes and the use of stand pipes or storage reservoirs, such as have heretofore been commonly employed is avoided.

Having thus described my invention what I claim is,

1. The combination with the water jacket of an engine of the class described, of two tanks arranged one above the other, a radiator between said tanks, a pump, a conduit leading from the lower tank to the pump, a conduit leading from the pump to the radiator, a conduit leading from the radiator to the water jacket, a conduit leading from the water jacket to the upper reservoir, and a conduit leading from the upper reservoir to the lower reservoir, for the purpose set forth.

2. The combination of a water jacket surrounding the cylinder of a motor vehicle engine, a tank, a conduit connecting the cylinder jacket and tank, an overflow pipe communicating with the upper portion of the tank, and a baffle arranged in the tank opposite the discharge opening of said conduit, for assisting in condensing the steam contained in the water entering the tank from the cylinder jacket.

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

RUSSELL HUFF.

Witnesses:

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EDWIN F. RAUSS.