

983,505

B. C. LORING.  
VEHICLE MOTOR COOLING DEVICE.  
APPLICATION FILED APR. 8, 1907.

Patented Feb. 7, 1911.

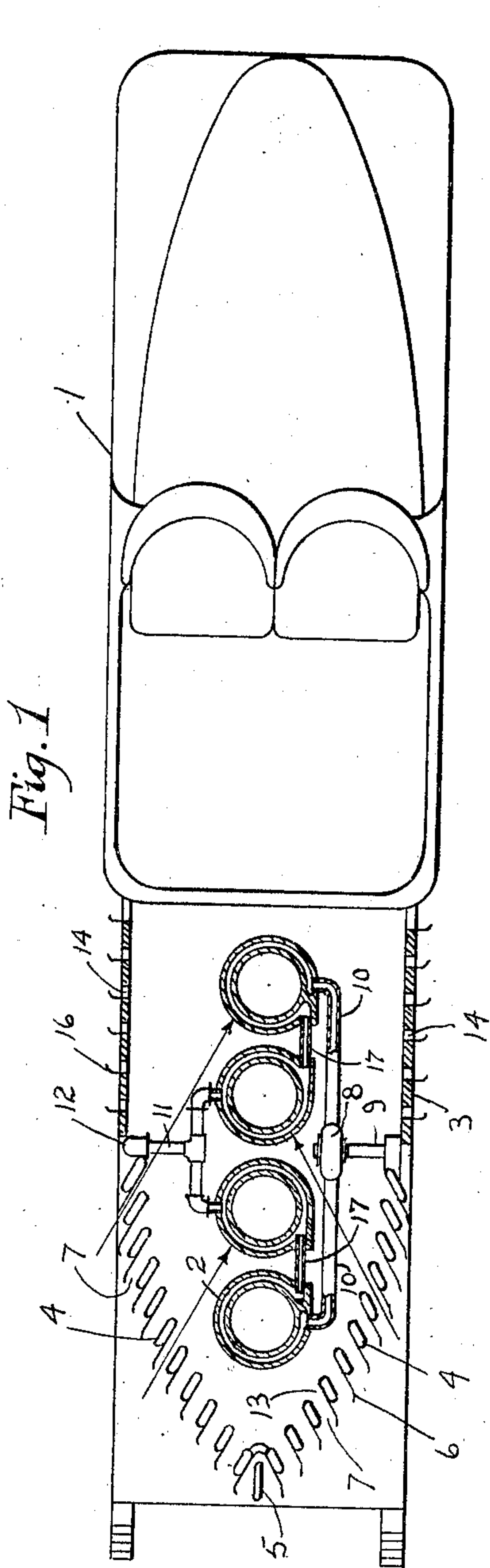


Fig. 1

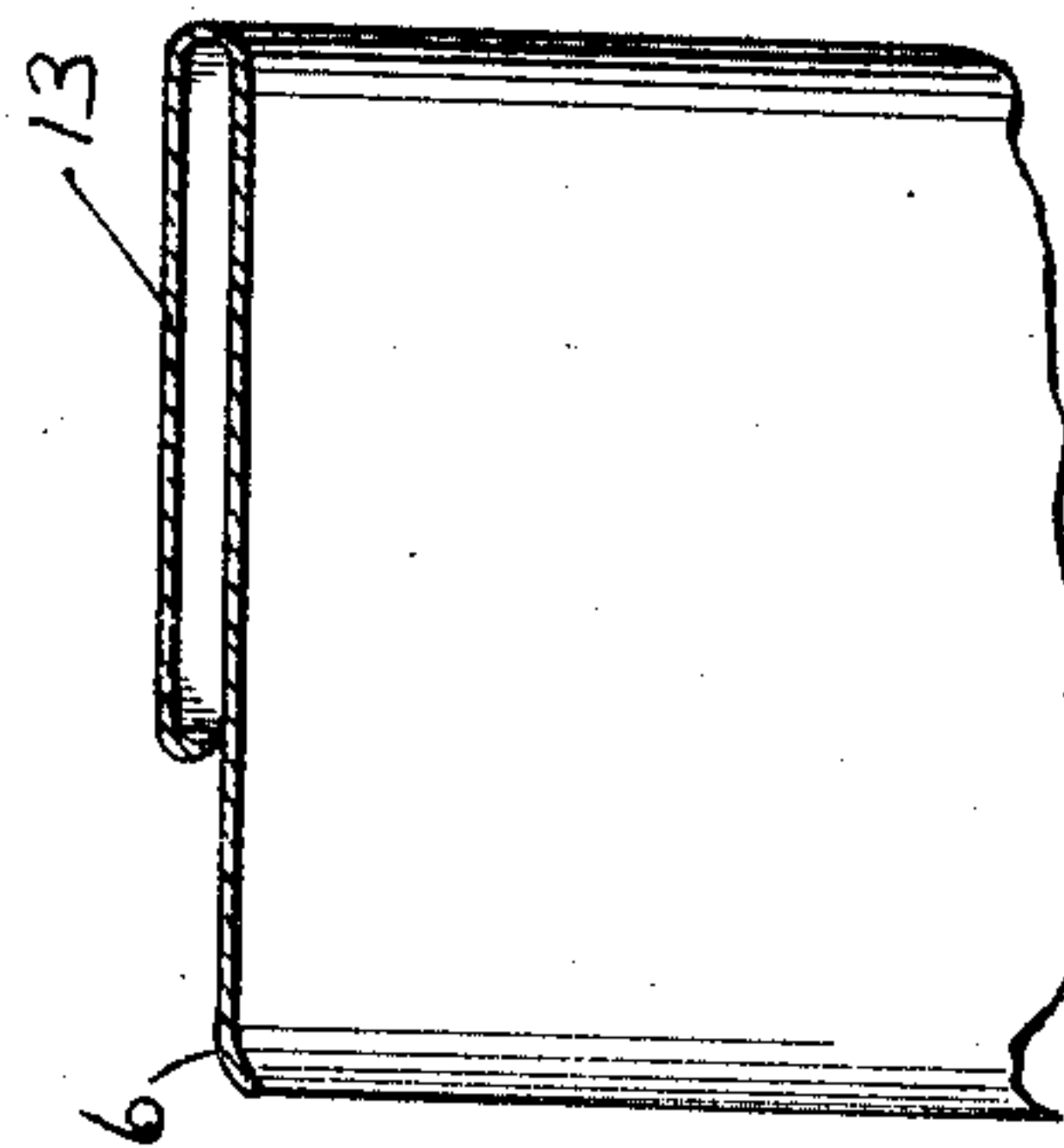


Fig. 3

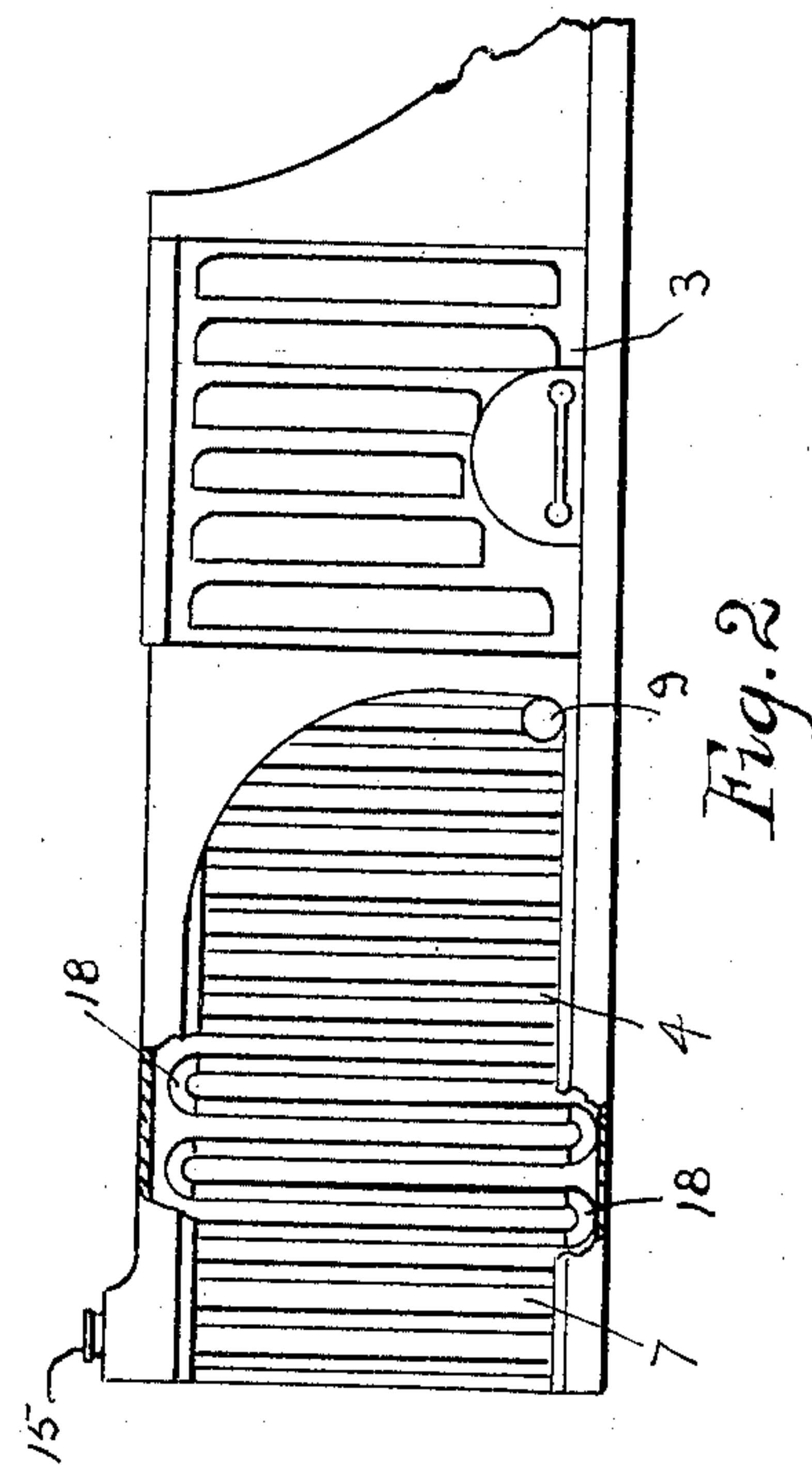


Fig. 2

Witnesses

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# UNITED STATES PATENT OFFICE.

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## VEHICLE-MOTOR-COOLING DEVICE.

983,505.

Specification of Letters Patent.

Patented Feb. 7, 1911.

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*To all whom it may concern:*

Be it known that I, BENJAMIN C. LORING, a citizen of the United States, residing at the town of Cranston, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Vehicle-Motor-Cooling Devices, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to an improved cooling device for automobile engines and has for its object to provide simple and effective means whereby the air may be caused to circulate rapidly around all of the engine cylinders and so prevent the same from overheating.

In carrying out my invention I provide a cooling device comprising a housing or casing about the engine whose sides taper toward the front, which form materially reduces the windage or frictional resistance in forcing a vehicle rapidly through the air. In using a tapering casing on an air cooled engine the air is readily forced in around all of the cylinders to carry off the generated heat.

Another feature of my invention is that in the use of water cooled engines this tapering portion of the casing may be used as a radiator through which the water is forced from one end to the other forming an extensive radiating surface wherein the water may be effectually cooled before it is carried again around the cylinders.

A radiator of my improved form serves to conduct the air through the radiator and direct the same around all of the engine cylinders thereby forming another means in addition to the water for cooling the engine cylinders.

In vehicles such as automobiles of the most recent construction wherein a plurality of cylinders are used the same are preferably set at the forward end of the car one after the other lengthwise of the same. The casing which covers or surrounds the engine usually has a square front portion provided with a grating through which the air enters to cool the cylinders. With this arrangement it is obvious that the first cylinder receives the greatest benefit from the cool air entering through the grating, the second cylinder receiving the heated air which passes the first cylinder, and so on until the last

cylinder receives but little benefit from such an arrangement. By the use of my improved form of casing this difficulty is entirely obviated, the air is caught by the projecting wings or vanes on the sides of the tapering casing and is conveyed to all of the cylinders equally, thereby making the last cylinder as cool as the first.

With these and other objects in view, the invention consists of certain novel features of construction, as will be more fully described and particularly pointed out in the appended claims.

In the accompanying drawings: Figure 1—is a top view of the body portion of a racing automobile with the upper portion or top of the casing removed exposing the ends of the radiator tubes, also showing the straight sides of the hood portion in section and illustrating the action of the air on the cylinders as it passes through the vanes in said casing. Fig. 2—is a side elevation of the casing showing the tapering radiating surface of the same. Fig. 3—is an enlarged detail of a thin flattened radiator water pipe which is located in the tapering casing, and also showing an outwardly projecting plate which catches the air and directs the same through the radiator onto the engine.

Referring to the drawings at 1 is the body portion of an automobile, which may be made in any desired form. At 2—2 are the engine cylinders located in the forward end of the car, the same being inclosed by the casing or housing 3. By casing I mean all of that covering which incloses the motor, including the forward or tapering part in which is set the hollow vanes for the water to circulate through, which part is ordinarily known as the radiator, and also the removable portion back of that which is commonly called the hood. At 4—4 are the tapering sides of the hood which are shown as being brought together substantially to an edge 5 in the front, but I do not confine myself to this construction as these tapering sides may terminate in a flattened portion at the front or round nicely about the forward cylinder if desired. It will be seen that the tapered portion of these sides reach well back around a portion of the engine, and the same are provided with apertures 7—7 set on an angle so as to direct the air which passes through them onto all of the engine cylinders contained within the casing,



the rear or last cylinder receiving substantially as much as the first. It is found advantageous to extend small plates, fins or vanes 6 out from these inclined sides at close intervals to catch the air as the vehicle is running rapidly and assist in drawing the same in and causing it to circulate around the engine. When water cooled engines are used the tapered portion of the casing is formed into a radiator having water pipes or hollow members or vanes 13 through which the heated water from the cylinders is caused to circulate to be cooled, thin flat pipes are preferably employed, but pipes or vanes of any style may be used.

In the ordinary radiator, which is set square across the front, it is difficult to obtain sufficient surface to cool the water of an ordinary engine on a hot day, or to keep the water of a racing machine below the boiling point in weather of any ordinary temperature, but by my improved construction the radiating surface is increased to more than double its ordinary capacity whereby the temperature of the water may be nicely controlled. This increase beyond the ordinary capacity for cooling is due to the fact that I have provided combined water conduits and air converging vanes so that the one mechanism serves the double function of facilitating both air and water cooling, since the interior of the vanes 13 provides for the circulation of the engine cooling water, while the sides of said vanes are not only presented to insure the most rapid cooling action of air upon the sides of said vanes or conduits so as to cool the water therein, but also concentrate or converge the air upon the sides of the series of engine cylinders.

Another feature of my invention is that the pump 8 is connected at 9 to the lower edge of the radiator on one side of the same and water is forced through the pipes 10 around the cylinder jackets shown in section in Fig. 1, thence through pipes 17 into the adjacent cylinders and out through the pipe 11 into the upper edge of the radiator at the point 12 on the opposite side from where it is withdrawn by the pump, thereby causing the water to flow through the hollow vanes 13, the adjacent ends of which are connected as at 18, and through the whole radiating surface before it is allowed to pass back around the cylinders. It will also be observed that even in a water cooled engine the fin 6 will catch the air and carry the same through the radiating pipe and around the cylinders causing a circulation of air around all of said cylinders to greatly assist in cooling the same. On the sides of this casing in the rear of the tapered portion apertures 14-14 are provided which are partially covered by rearwardly pro-

jecting plates 16 thereby assisting in drawing the air from the casing causing a rapid circulation through the same. The radiator may be filled with water in the usual way through the inlet pipe 15 in the radiator.

In summing up the advantages, by my improved construction the air cooled engine, which has heretofore given a great deal of trouble by overheating, becomes thoroughly cooled, thus offering a simple and practical solution of what has heretofore been considered a difficult problem. Then again, in the water cooled engine the radiator is provided with a greatly increased area whereby the temperature of the same may be brought as low as desired, and at the same time the circulation of air is increased around the cylinders, which greatly assists in cooling the same.

In the construction of a casing for either style of engine it is found of great advantage in addition to the circulation of air through the hood to have the side walls of the same converge in order to reduce the resistance in forcing a car rapidly through the air, which is a very important feature, especially in cars that are designed to be driven at a rapid rate of speed.

The preferred construction is, as shown in the drawings, such that the series of vertical conduit vanes 13 which are flattened in cross section, present a tapering formation with the conduit vanes on one side inclined outwardly and to the right, those on the other sides being inclined outwardly to the left, thereby providing in the best manner for the double cooling function hereinbefore described.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. A cooling device for automobiles comprising a series of vertical conduit vanes flattened in cross section and arranged in tapering formation, the vanes on one side being inclined outwardly to the right and those on the other side being inclined outwardly to the left.

2. A cooling device for automobiles comprising a series of vertical conduit vanes flattened in cross section and arranged in tapering formation, the vanes on one side being inclined outwardly to the right and those on the other side being inclined outwardly to the left, the said vanes having thin metal portions projecting forwardly beyond the conduit portions.

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

BENJAMIN C. LORING.

Witnesses:

HOWARD E. BARLOW,  
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