

N. M. LA PORTE.
COOLING SYSTEM.
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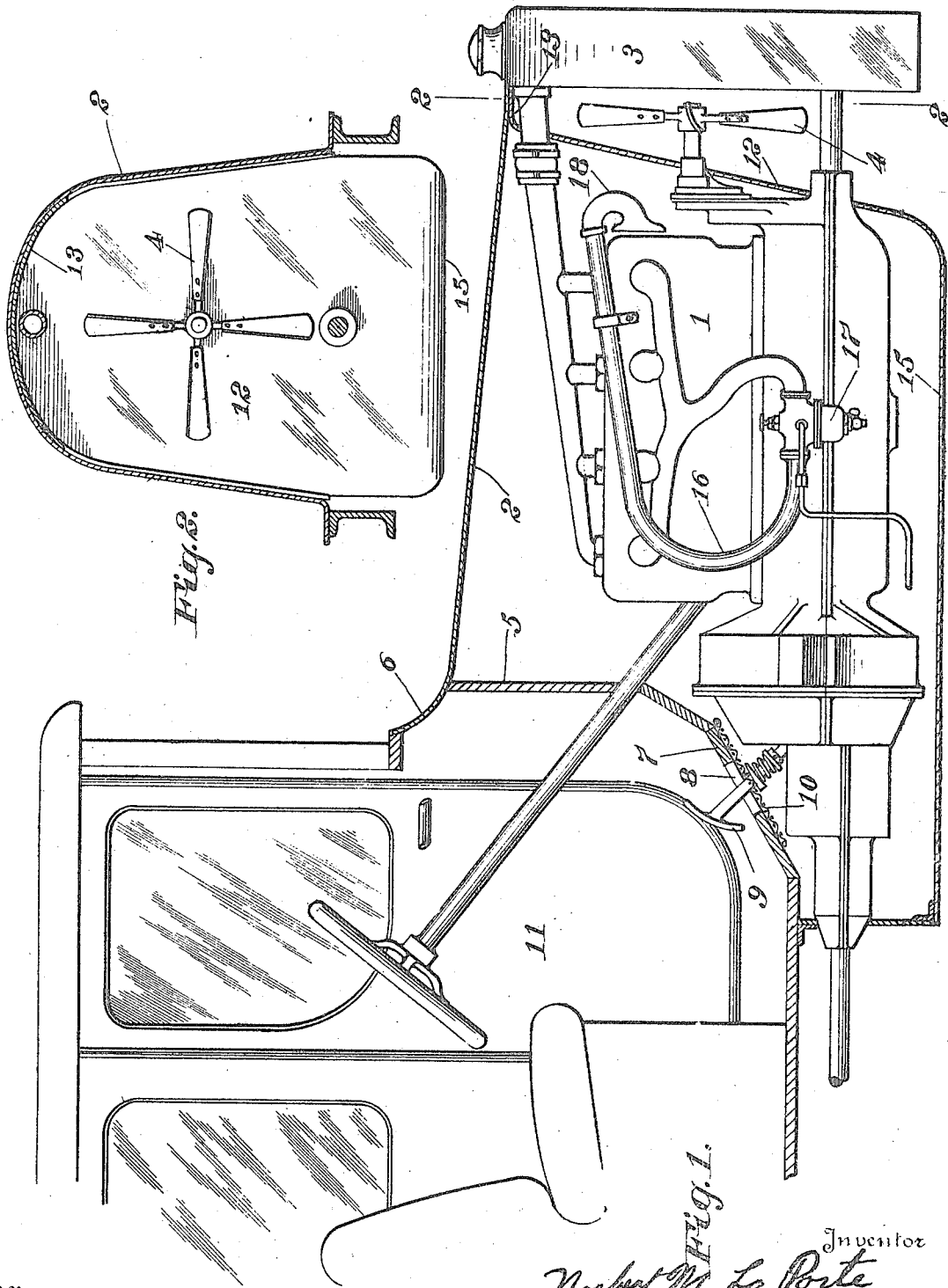


Fig. 2.

Fig. 1.

Witnesses
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NORBERT M. LA PORTE, OF BALTIMORE, MARYLAND, ASSIGNOR TO THE MOTOR COOLING SYSTEMS COMPANY, A CORPORATION OF MARYLAND.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, NORBERT M. LA PORTE, a citizen of the United States of America, residing in the city of Baltimore, State of Maryland, have invented certain new and useful Improvements in Cooling Systems, of which the following is a specification.

The disadvantages of the prevailing system of cooling automobile engines are well understood. The suction of the fan draws in the grit and dust thrown up by the front wheels and floating in the air in the immediate vicinity and passes them back through the radiator and into the hood and pan. All machines are partially controlled by foot levers, the pedals of which extend up through slots in the foot-board and these slots provide an opening into the pan through which the air forced into the hood and pan escapes. The air passing through the radiator takes up the heat from the cooling water and is necessarily heated. As the driver operating the foot-control must keep his feet constantly in the heated draft, he is, particularly in summer, exposed to a considerable degree of discomfort.

In addition to the discomfort, another objection to the present system is that due to the constant showering of the motor with grit which cannot be kept entirely out of the bearings. Also, the air which, with the vaporized hydro-carbon, forms the combustible mixture burned in the engine, is ordinarily taken from inside the hood and when the air in the hood carries in suspension a large proportion of grit in a more or less finely divided form, this grit is carried through the carbureter to the engine with the result that part of it is deposited on the cylinder walls and, mixed with the oil, forms a gritty paste the grinding effect of which materially shortens the life of the engine. Another fact of considerable importance is that no cheap and efficient means has as yet been provided for effectively ventilating the bodies of the various closed cars known as coupelet, limousine, sedan, town cars and the like. It is also a recognized fact that the efficiency of operation is much less in winter than in the warmer months and that a supply of air for the carbureter at or approaching a constant temperature would be a great advantage if it could be obtained economically.

Knowing that the volume of air consumed by any automobile engine as an element of

the combustible mixture is large, I have discovered that this quantity of air, if taken from the body of the machine, operates by displacement to give a sufficient ventilation. If this quantity of air is drawn in an unheated state over the engine casting instead of being passed first through the radiator, it gives a cooling effect at least equal to the larger column of air handled by the fan and passed through the radiator before it comes in contact with the engine. To obtain the highest efficiency in running, it is necessary to have a supply of air at a constant, preferably a medium, temperature. The air which is drawn from the outside and used for cooling the cylinder is available as an air supply for the carbureter so that with the improved construction, the engine may run under constant temperature conditions, and while the air thus taken from the body of the car to form the supply from the carbureter is ordinarily not laden with suspended grit and dust, it may without difficulty be filtered.

As a result of the various discoveries and the inventive acts to which I have referred, I have evolved an arrangement of the radiator, fan, hood, pan, engine, air-pipe and carbureter whereby, first, the dirt-laden draft from the fan, having served its function, that of cooling the radiator, is deflected and released without being admitted to the hood or brought in contact with the motor; second, ventilation is accomplished by taking from the body the supply of air consumed in the engine; third, the carbureter is supplied with air at a constant temperature; fourth, the engine is subjected to the cooling action of the air current which supplies the carbureter instead of that of the comparatively warm air which has passed through the radiator; fifth, the air fed to the carbureter is conveniently filtered by screens placed in the foot-board openings and in the same way the dirt and grit is kept off the engine; sixth, by thus closing the hood, the engine is, when not running, inclosed by a blanket of still air which retards cooling and reduces the difficulty incident to starting in cold weather.

In the accompanying drawings, I have illustrated so much of the forward part of an automobile including the hood, radiator, and a portion of the body as is necessary to a complete understanding of the invention.

Figure 1 is a vertical, longitudinal sec-

tion through the hood, pan, and dash, showing the cylinder casting and fan in elevation; and Fig. 2 is a vertical, transverse section on the line 2, 2 of Fig. 1, looking to the rear.

Referring to the drawings, I have shown in a general way the forward end of an automobile showing the motor 1 inclosed in a hood 2 and a radiator 3 at the forward end of the hood, the fan 4 drawing air through the radiator. In the rear, there is a dash 5, cowl 6, foot-board 7 with slots 8 for controlling levers 9, the slots 8 being covered by screen fabric 10 secured to the control levers, and I have also shown a portion of the body 11 which may be either open or closed, though certain features of this invention are particularly adapted for ventilating a closed body. In front of the engine and just in the rear of the radiator and fan, I have shown a shield or partition 12 which closes completely the forward end of the hood. The shield may be formed of sheet metal and have the edges flanged at 13 to engage the hood and form a comparatively close contact along the entire transverse length of the plate of which the hood is formed, so as to cut off the radiator completely from the engine. This plate or shield 12 may be inclined backward from the top toward the bottom; as shown, the lower end is carried to the rear forming the engine pan 15 integral with the shield 12, or the parts may, if desired, be made separate, the object being to close the fan end of the hood and shield the engine from the draft passing through the radiator.

At 16, I have shown an air intake pipe leading to the carbureter 17 to supply the air consumed in the engine. This pipe 16, in the form of the invention shown, is led horizontally along the whole length of the engine casting and backward and downward to the carbureter, but the important feature is that the intake end 18 of this pipe is placed adjacent the engine casting and at the end of the casting remote from that by which the air supply enters the hood space, the air opening in the present instance being by way of the slots 8 in the foot-board 7 and the air intake end of the pipe 16 being therefore at the forward end of the engine casting, and shown as near the top.

The operation of the device as described will be easily apparent from the preamble taken in connection with the description and drawing. The air drawn through the radiator, which in dry weather is laden with dirt and grit, after having accomplished its main function, that of cooling the radiator surface, is thrown against the shield 12 and deflected downward beneath the pan, or otherwise turned aside from the motor so that the latter is completely protected from the dirt, dust and grit of the road, with the

advantage not only that the bearings and wearing parts have a longer life, but also that the parts do not become fouled and are more convenient for handling, adjustment and the like.

As a substitute for the slight cooling effect on the engine casting of the air draft from the radiator, the air supply to the carbureter is passed over and in contact with the engine having an equivalent, if not greater, cooling effect because of the fact that when it first comes in contact with the engine, this air is practically of the outside temperature. A further advantage inures from the fact that the air supply, when it has been passed over the engine, reaches the carbureter at a temperature which can vary but slightly after the engine has once been started and has reached its running temperature. In this way, variations in efficiency and hence the necessity for variation of adjustment to compensate for weather changes are dispensed with.

As has been pointed out, the air supply to the carbureter is drawn through the foot-board 7 by way of the control slots 8, or drawn in any other convenient manner from the body. The volume and extent of the air supply consumed by the average automobile is large. This volume of air when drawn through the car body, offers amply sufficient ventilation and also, when drawn over the surface of the engine casting, has a marked cooling effect on the engine.

It is apparent that the air supply drawn from the car body will contain much less dust and grit than if taken from the road surface as is the air supply handled by the fan, but in addition to this, it is convenient with the arrangement described, to provide filtering means over the foot-board openings, so that all the air taken into the hood and the parts thus inclosed, is kept absolutely clean. The advantage in the way of excluding the grit from the engine bearings, however well covered, and particularly from the air which enters the cylinder, will be clearly apparent to those skilled in the art.

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

1. In an automobile having an engine, a radiator forward of the engine, a fan directly in the rear of the radiator, on a level with the central portion of the radiator, and between the radiator and the engine for drawing air through the radiator, and a shield between the fan and engine to prevent the passage of the air from the fan into contact with the engine and means serving with the shield to completely inclose the engine and prevent the access of outside air and dirt to the engine.

2. In an automobile having an engine, a

5 radiator forward of the engine, a fan directly in the rear of the radiator, on a level with the central portion of the radiator, and between the radiator and the engine for
10 drawing air through the radiator, a shield between the fan and engine to prevent the passage of the air from the fan into contact with the engine, a hood inclosing the engine, and having a small opening for the
15 admission of air to the hood space, a carbureter, and means for leading air to the carbureter, taking it from a point adjacent the engine casting so that the air supply is drawn over the engine and heated to a substantially constant temperature.

3. In an automobile having an engine, a radiator forward of the engine, a fan for drawing air through the radiator, a shield between the fan and engine to prevent the
20 passage of the air from the fan into contact with the engine, a hood inclosing the engine, a small opening for the admission of air to the hood space, a carbureter, and means for leading air to the carbureter, taking
25 it from a point adjacent the engine casting on the side of that casting opposite the air inlet to the hood.

4. In an automobile, an engine, means for passing cooling water through the engine
30 casting, a radiator for cooling the water, means completely inclosing the engine on all sides and providing a dead air space around the engine, a carbureter taking air from the inclosed space, and openings leading from

the hood space to the body whereby the displacement of air to feed the engine ventilates the body. 35

5. In an automobile, an engine, a hood inclosing the engine on all sides with a small opening only for the admission of air from
40 the car body to supply the engine in running, a carbureter, and an air inlet to the carbureter inside the hood adjacent the engine casting and on the side of the casting opposite the hood inlet opening whereby
45 the air supply for the carbureter is drawn over the engine casting and given a temperature which is substantially constant and unaffected by the variation of the temperature of the outside air and the engine is correspondingly cooled. 50

6. In an automobile, an engine, a cooling water jacket in the walls of the cylinders, a radiator for cooling the water, a fan for passing the air through the radiator, a
55 shield between the fan and engine, a hood inclosing the engine and with the shield forming a tightly inclosed space about the engine, a carbureter taking air from the hood, and an air opening leading from the
60 car body to the hood.

Signed by me at Baltimore, Maryland,
this 14th day of June, 1915.

NORBERT M. LA PORTE.

Witnesses:

EDWARD L. BASH,
ALICE G. DONEGAN.