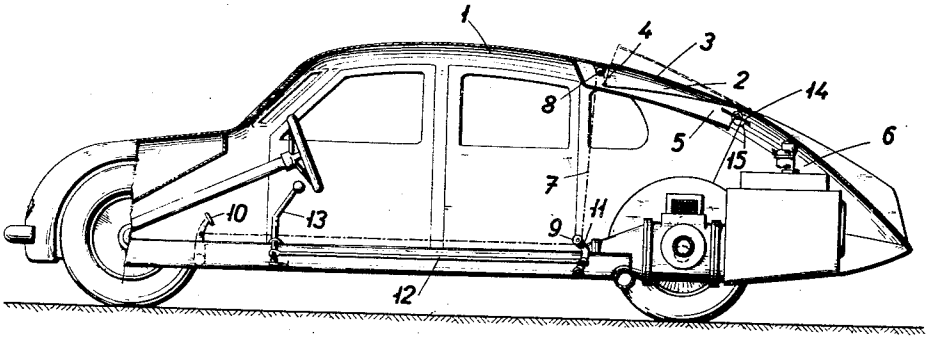
Oct. 10, 1939. M. KLAVIK 2,175,529

SUPPLYING COOLING AIR TO THE ENGINES OF AUTOMOBILES

Filed Dec. 20, 1938

FIG. 1.



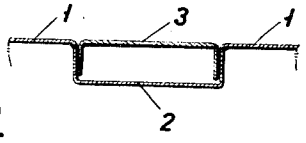


FIG. 2.

Inventor
Milos Klavik
By B. Singer, Atty.

Patented Oct. 10, 1939 2,175,529

UNITED STATES PATENT OFFICE

2,175,529

SUPPLYING COOLING AIR TO THE ENGINES OF AUTOMOBILES

Milos Klavik, Prague, Czechoslovakia

Application December 20, 1938, Serial No. 246,924
In Czechoslovakia December 1, 1937

5 Claims. (Cl. 180—54)

In air cooled automobiles with streamlined bodies and rear engines, the cooling air is conveyed to the engine through openings arranged variously on the surface of the carriage body, from which openings conduits or the like lead to the engine chamber.

These suction openings, whether they are arranged on the top or on the side surfaces of the body, have various defects. If they are arranged directly in the surface of the carriage body, the entry of the externally flowing air into the body is very small during running or it may entirely cease, so that almost the whole of the cooling air must be drawn by fans into the vehicle to the detriment of the output of the engine. Furthermore, the general aspect of the car is affected thereby, especially when in front of these openings there are provided depressed inlets which, whilst facilitating the passage of air to the openings at low speeds, fail with greater speeds, when these depressions are passed over by the flow of air, so that the air cooling must be assisted by fans. The most favourable solution for the delivery of cooling air is by additions arranged at various parts of the body and which are open opposite to the direction of travel in such manner that a definite constant quantity of the air flowing over the surface of the body penetrates from the exterior into the body, this quantity corresponding to the surface area of the opening in the projecting part or in the addition to the body. This solution however, again means a certain interruption of the flowing shape of the body and greatly prejudices the smooth appearance thereof.

By the arrangement of the supply of cooling air according to the invention, these previous defects are obviated completely by the surface of the streamlined body being provided at suitable points, e. g., above or at the side, with longitudinal openings which are closed by longitudinal flaps of equal length which positively open at their end surfaces facing the direction in which the air travels when the automobile is running. This opening of the flaps is controlled in direct dependence upon the actual consumption of air, this being attained by the flaps being actuated by the movement of the same members which control the revolutions of the engine on the one hand, and the speed of the car on the other hand. The pull rods or cords actuating the said flaps are connected on the one hand with the pedal actuating the accelerator, and this in such manner that these flaps for the supply of cooling air open more the more the accelerator is opened and on the other hand these pull rods or cords of the flaps are connected with the actuating lever of the speed gear in such manner that the flaps open wider the lower is the speed of the car. Thus, for example, in running up an incline if the speed of the vehicle is low but the speed of rotation of the engine is high and the consumption in cooling air is thus large, the flaps are opened to the maximum amount. If, on the contrary, whilst the speed of rotation of the engine is high, the velocity of travel of the car is also high, for example in running on the level, then the flaps are closed somewhat, since with a high speed of the vehicle even with almost closed flaps, a sufficient quantity of cooling air is supplied to the engine.

The size of the maximum opening of the flaps can be easily determined from the maximum requirement in air, the size of the engine and the fans corresponding thereto, and the speed of the vehicle. If the speed of the vehicle is zero and the engine is running, the opening of the flaps is controlled by the accelerator to correspond exactly to the requirement in air of the fan, which in this case alone effects the delivery of the air to the engine. When the vehicle commences to move, the flaps may be changed from the position of maximum opening into the almost closed position, since now the flow of air over the surface of the vehicle commences to assist the fan and this becomes all the greater as the speed of the vehicle is greater.

With stationary vehicle and stationary engine, the flaps are completely closed, so that the appearance of the carriage body is preferably smooth.

Apart from retaining the appearance of the vehicle, the greatest advantage of this arrangement consists in the engine being under all circumstances exactly so cooled as its best output requires, which in view of changes of temperature of the air can be increased by the use of a thermostat, which is either connected directly in the actuating rod system or in the cord connections of the flaps, or is combined with a secondary or correcting flap or flaps which are arranged in front of the engine fan.

A construction of the invention is shown diagrammatically on the drawing, by way of example.

Figure 1 is a longitudinal section, and

Figure 2 is a cross-section through the flap and the adjacent wall.

The streamlined body 1 of the vehicle with rear engine has on the upper surface in the

vicinity of its rear part cut-out parts 2 running in the longitudinal direction of the vehicle, and there are carried in these cut-out parts the oscillatable longitudinal flaps 3, the shape of which corresponds exactly to the shape of the cut-out parts and which entirely close these cut-out parts when the engine is not running. The flaps 3 are hinged at the rear end on to the carriage wall, whilst they are open at the front end or at the end face 4, that is, in the direction from which the flow of air comes during running. Consequently, on the raising of the flaps by the front end thereof, there is caught a current of the externally flowing air proportional to their opening and this is conveyed through the conduit 5 into the engine chamber 6. The flaps 3 are pressed from metal plate and have the cross-section of an inverted U.

The opening and closing of the flaps 3 is controlled for example by means of a cord 7 which is carried over rollers 8 and 9 to the pedal 10, which at the same time actuates the carburettor of the engine in the sense that on the opening thereof the flaps 3 are opened. The rollers 9 are here carried on pivoted levers 11 which by means of a pull rod 12 are connected with the actuating lever 13 of the change speed gear. In view of the variations of temperature of the air, there may also be provided in the conduit 5 a correcting flap 14 actuated by a thermostat 15 although a suitable device for varying the length of the cord 7 or of the pull rod 12 for summer and winter temperatures is sufficient.

The device illustrated is only an example of carrying out the invention and the actuation of all the members described may take place in detail in other ways and by other means, without thereby departing from the invention.

I claim:

1. An arrangement for supplying cooling air to the rear engine of an automobile having a streamlined body, comprising an engine chamber, inlets on the body communicating with the chamber, pivoted flaps adapted to open and close the inlets and means for closing and opening the flaps dependent on the control of the engine.

2. An arrangement for supplying cooling air to the rear engine of an automobile having a streamlined body, comprising an engine chamber, an inlet on the body adjacent the engine chamber and communicating therewith, pivoted flaps adapted to open in the direction from which the air comes when the automobile is running and to close the inlets and means connecting the flaps with the control gear of the engine.

3. An arrangement for supplying cooling air to the rear engine of an automobile having a streamlined body, comprising an engine chamber, inlets on the body communicating with the chamber, pivoted flaps adapted to open and close the inlets, a thermostat and means associated with the thermostat for controlling the flaps dependent on the thermostatic reactions to the temperature of the surrounding air.

4. An arrangement for supplying cooling air to the rear engine of an automobile having a streamlined body, comprising an engine chamber, inlets on the body communicating with the chamber, pivoted flaps adapted to open and close the inlets, means for closing and opening the flaps dependent on the control of the engine, a thermostat and flaps adjacent to and controlled by the thermostat.

5. An arrangement for supplying cooling air to the rear engine of an automobile having a streamlined body, comprising an engine chamber, an inlet on the body communicating with the interior of the chamber, a U-shaped pivoted flap of pressed metal, a pivot for said flap and means for moving said flap upon said pivot dependent on the control of the engine.

MILOS KLAVIK.