

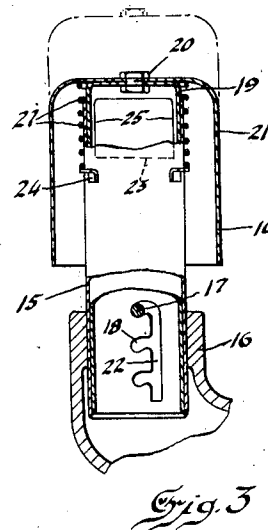
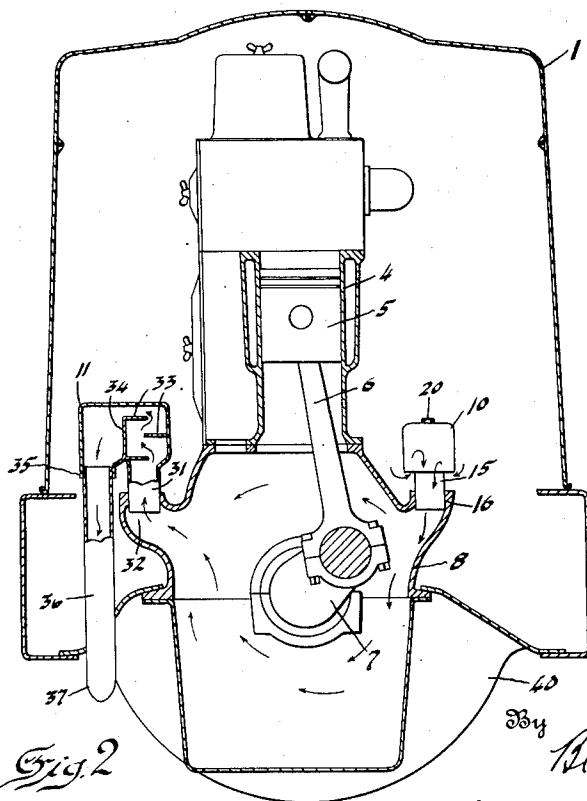
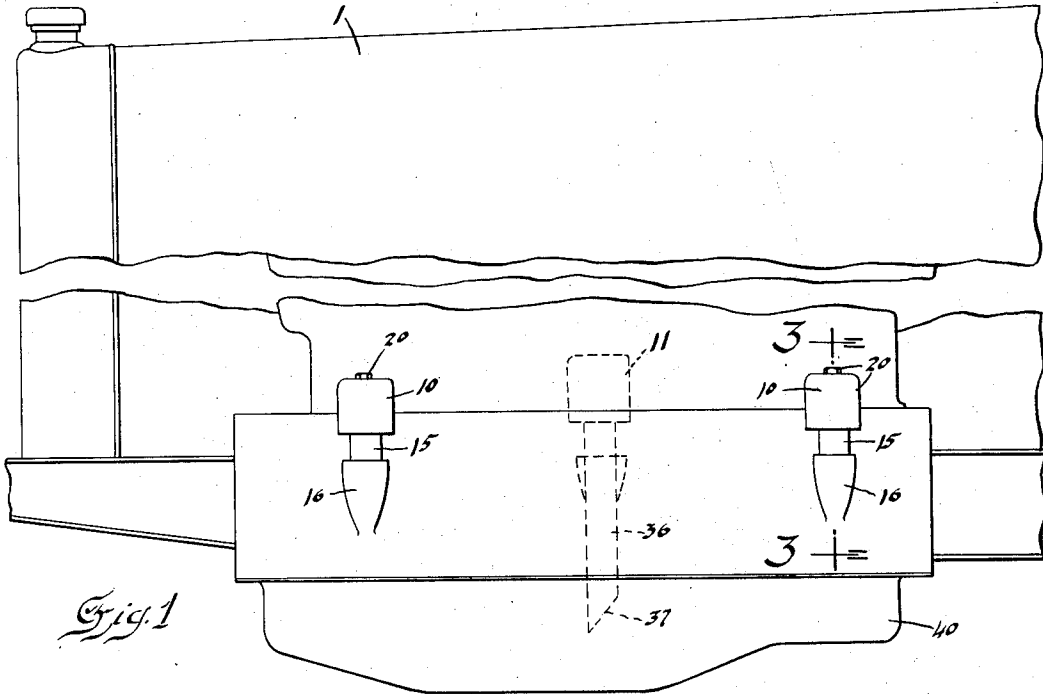
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CRANK CASE VENTILATOR

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CRANK CASE VENTILATOR

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The invention relates to crankcase ventilators for automobile engines.

The object of the invention is to provide a new method and a new device for ventilating the engine crank case. More specifically the object is to make use of the forward motion of an automotive vehicle including a hood, and the consequent air-collecting action of the hood, to develop an excess pressure necessary to force the air thru the crank case. A further object is to provide a simple device which is capable of adequately ventilating the crankcase by the above method. A further object is to simplify and reduce the number of parts necessary for efficient crankcase ventilation, thus reducing the cost and lessening the probability of loose or broken parts and their accompanying noises. A further object is to provide a simple adjustment by means of which due allowance can be made for varying temperatures at which it is necessary for machine to operate, thus insuring adequate ventilation at all temperatures.

Other objects and advantages of the invention will appear in the course of the following description, taken in connection with the accompanying drawing, and will be particularly pointed out in the appended claims.

In the drawing:

Figure 1 is a side elevation with part of the hood broken away, showing a conventional internal combustion engine with two air inlet openings and the outlet conduit on the opposite side of the hood shown in dotted lines.

Figure 2 is a view of the structure shown in Figure 1, partly in transverse section.

Figure 3 is a section on the line 3—3 of Figure 1, showing the inlet in detail, with the lower part broken away.

In prior constructions, it has been customary to provide a suction or aspirating device on the outlet conduit and thus, by providing inlet openings ventilate the crankcase by suction. In order to do away with the disadvantages which accompany this system, I have devised the present method.

I have found that in a car in which the engine compartment is closed on the under side, the air pressure within the hood can be increased considerably above atmospheric pressure by partly closing the louvers or doing away with them entirely. In order to make use of this pressure in ventilating, restricting and controlling the egress of air from the hood I have provided one or more inlet openings in the crankcase within the hood space and an outlet which must extend outside

the hood space or to a region of atmospheric pressure. In the conventional engine as illustrated, I have not shown any fan to force the air toward the rear part of the engine because I wish it to be understood that my novel method of ventilation can be used on a car even without such a fan. The forward movement of the car may be used to cause an increase in a restricted-exit pressure within the hood sufficiently great to force a current of air thru the inlet into the crankcase and out thru the outlet provided.

In the drawing, the numeral 1 indicates generally the hood of an automobile. The hood is formed in the present case without the customary louvers, tho it is within the scope of my invention to provide louvers of less than the ordinary size or louvers adjustable in size, as it may be impracticable for all the air entering the hood to escape through the crankcase. These louvers may be at any part of the hood so long as they are suitably disposed to permit escape of air from the hood and are of such restricted size that a suitable superatmospheric pressure will be built up within the hood by the air entering through the usual radiator or other air inlet openings. That is, the hood is substantially entirely closed except for the radiator or like inlet openings, the louvers or similar outlet openings which may be provided as indicated above, and the ventilating passage through the crank case. In the following description and claims, the terms "closed hood" "controlled-exit hood" are used to denote a hood formed so that, by one of these means, the air pressure about the inlet opening may be maintained above that of the atmosphere. The engine is of the ordinary vertical type, the numeral 4 indicating the jacketed cylinder, 5 the piston, 6 the connecting rod, 7 the crankshaft and 8 the crankcase. The numeral 10 indicates generally an inlet opening and the numeral 11 an intermediate portion of a special outlet fitting. In the present case, I have shown two inlet openings and one outlet opening, tho it is obvious that this number may be varied to suit the requirements of different engines.

As shown in Figure 3, the air inlet comprises a cylindrical part 15, fixed in a correspondingly shaped opening 16 in the crankcase. Fixed in the side of the cylinder 15, as at 17, is a screw or lug extending within the cylinder. Fitting snugly within the cylinder 15 and slidable therein is the cylinder 19, and fixed rigidly to the cylinder 19, as by a bolt 20, is the cap 21. At its upper end, the cylinder 19 is cut away on opposite sides, as at 23, leaving two oppositely disposed

supporting strips or columns 25. By this means, the cylinder is left open over about five-sixths of its circumference and to the depth indicated in dotted lines by the numeral 23. A slot 22 is formed in the lower part of the cylinder 19 and is provided at spaced intervals along one side with offset horizontal portions or notches 18. This slot acts as a guide for the lug or screw 17. On the outer surface of the cylinder 15 are spaced abutments 24, fixed to the side of the cylinder by any ordinary means as by soldering. Surrounding the outer cylinder and extending between the abutments 24 and the cap 21 is a coil spring 27. This spring is under compression and always exerts a lifting force on the cap 21 and its attached inner cylinder 19. By this construction it may be readily seen that the device may be held in closed position as illustrated in Figure 3, or by rotating the cap and inner cylinder slightly, the lug 17 may be freed from the upper notch in the slot 22 and the spring allowed to lift the cap 21 and inner cylinder 19 to the raised or open position. I have shown the slot 22 as provided with notches 18 so that the extent of the opening under the cap 21 can be varied, and while I have shown three of these, the exact number is immaterial.

As shown in Figure 2, the outlet conduit comprises an inner cylindrical portion 31 fitting in a correspondingly shaped opening 32 in the crankcase and fixed there in any ordinary manner. Immediately above this portion 31 are shown baffle plates 33, arranged in an overlapping manner in the intermediate portion 11, as indicated. While I have shown three baffle plates, it is obvious that a different number may be used. A center wall 34 extends nearly to the top of the outlet conduit. On the outer side of this center portion 34, the section 11 of the outlet conduit is formed with a downwardly extending cylindrical opening 35 and fixed in this opening, as by welding or otherwise, is a tube 36 which is shown as extending down below the dust pan 40. The lower end of this tube is shown as sheared at an angle, as indicated at 37. The provision of this rearwardly fixed angled end on the tube 36 causes the air currents resulting from the motion of the car to produce a slight suction or aspirating effect on the tube, this action aiding the movement of the current of air through the crankcase.

The device operates in the following manner:

With the engine running, the air pressure within the hood is increased, either by the fan or by forward movement of the car, or both, and air is forced into the crankcase. The air inlets are shown as on the left hand side of the engine, in which case, as the crankshaft rotates clockwise, as viewed from the front, circulation of the air is aided by its rotation, as indicated by the arrows in Figure 2. Small particles of oil that may

be picked up by the current of air strike against the baffle plates 33 and drain back into the crankcase.

During cold weather, the combustion chamber gases which escape between the piston and cylinder wall will condense more quickly than in warm weather, as the crank case and its associated parts stay colder. Hence, a greater current of air is required in cold weather than in warm weather. To make allowance for different temperatures, the effective extent of the inlet openings may be varied by fixing the lug 17 in any one of the notches 18.

What I claim is:

1. A method of ventilating an automobile crankcase which consists in so restricting and directing egress of air from a hood compartment containing a radiator that the air entering thru the radiator into the hood will be therein maintained at higher than atmospheric pressure, and so directing the air from said hood as to force a current of air into a crank case.

2. A method of ventilating as defined in claim 1 in which the air so directed is delivered from said crankcase through a tube terminating outside said hood in partially or completely closing the hood compartment so that the air entering thru the radiator will be maintained at higher than atmospheric pressure and, by providing in the crankcase an air inlet opening within the hood compartment and an air outlet opening outside of said compartment, using the constant difference in pressure for maintaining a constant flow of air thru said openings.

3. In an automotive vehicle including an internal combustion engine and a closed hood, an inlet to the engine crankcase within the hood, means for adjusting the capacity of said inlet, and an outlet in the crankcase extending to a point outside of the hood.

4. In an automotive vehicle including an internal combustion engine and a closed hood, an adjustable inlet in the crankcase within the hood comprising a fixed member having an opening therein, a movable member supported on said fixed member and adjustable to vary the capacity of said opening, and an outlet in the crankcase extending to a point outside of the hood.

5. The combination in an automobile of a "closed hood", as described, an internal combustion engine disposed therein, said engine having a crankcase provided with an air inlet communicating with the interior of the hood and an outlet communicating with atmosphere outside of the hood, said outlet comprising a conduit having an interiorly baffled portion rising from the crankcase and a portion communicating with the baffled portion extending in a different direction and terminating outside of the hood.

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