Sept. 8, 1931. W. S. COCHRANE 1,822,201

CRANKCASE VENTILATOR

Filed April 20, 1927

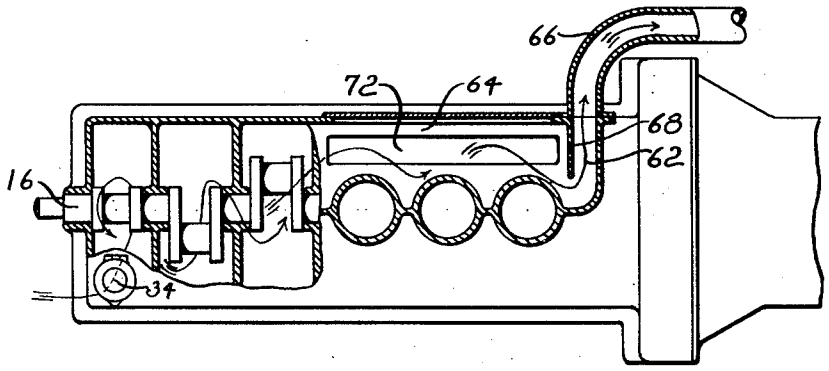


FIG 1

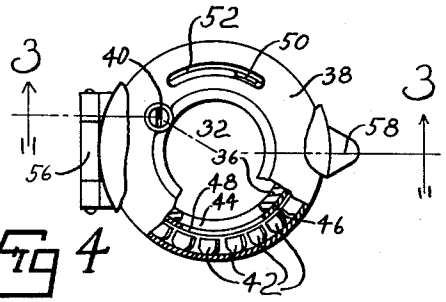


FIG 4

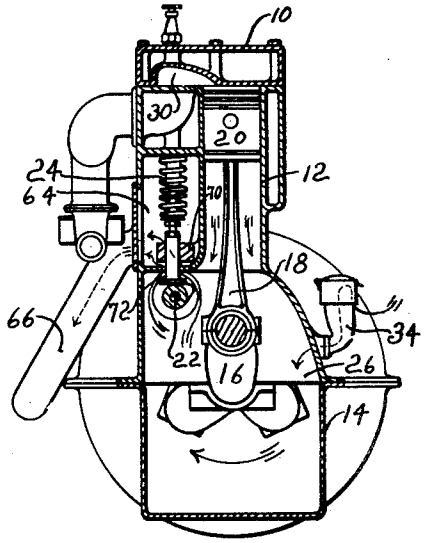


FIG 2

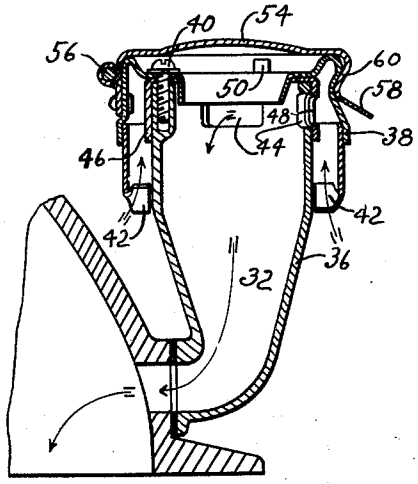


FIG 3

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UNITED STATES PATENT OFFICE

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CRANK CASE VENTILATOR

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This invention relates to internal combustion engines and more particularly to the ventilation of the crankcase of an internal combustion engine such as is used for motor vehicles.

An important object of the invention is to utilize the natural forces of the engine to cause a current of air to flow spirally from the forward end of the crankcase to the rear end and out thru the valve chamber, exhausting therefrom downwardly and rearwardly outside the engine.

Considerable pressure is formed under the hood of a motor vehicle when it is in forward motion and this pressure is utilized to cause a current of air to flow thru a novel cover for the oil filler at the forward end of the motor into the crankcase. The fanning effect of the rotating crankshaft, together with its associated connecting rods causes the air current to flow in a circular direction within the crankcase and due to the centrifugal force the air current is conducted from the crankcase to the valve chamber. To maintain a continued circulation of air in this direction and to direct the air current rearwardly thru the engine, the exhaust has been located at the rear end of the motor leading from the valve chamber and directed downwardly and rearwardly so that when the engine is in forward motion a suction is created, further assuring a constant air current thru the crankcase and valve chamber.

Another object of the invention is to provide means for separating any dirt from the air current passing thru the crankcase illustrated in connection with the oil filler.

A further object of the invention is to provide a practical and comparatively inexpensive means for passing a sufficient amount of air thru the crankcase.

These and other objects of the invention will more fully appear from the following description taken in connection with the accompanying drawings, in which:

Fig. 1 is a longitudinal sectional view, partly thru the crank case and partly thru the valve chamber of an internal combustion engine showing the path of the air current.

Fig. 2 is a vertical sectional view thru the engine.

Fig. 3 is a sectional view thru the oil filler.

Fig. 4 is a plan view of the filler, parts being broken away.

Referring to the drawings, an internal combustion engine having a cylinder head 10, cylinder block 12, and oil pan 14, has been selected for illustrating one embodiment of my invention. The usual crankshaft 16, connecting rods 18, pistons 20, camshaft 22 and valve mechanism 24 have been shown adapted to operate in the usual manner. The lower portion of the cylinder block 12 and the oil pan 14 form a chamber 26 commonly called the crankcase in which the crankshaft rotates.

The blow by gases from the combustion chamber 30 past the pistons 20 contain unburnt gasoline and water vapors and the difference in temperature between the vapors and the comparatively cool crankcase wall causes condensation of water and gasoline vapors, which if not removed before they condense dilute the lubricant in the chamber.

Mounted on the side of the crankcase is an oil filler 34 thru which lubricant is supplied to the crankcase and which has been so constructed to admit an air current. The filler comprises a tubular member 36, open at both ends, the lower end of which is in communication with the crankcase chamber 26 adjacent one of the end connecting rods, preferably the forward end. At the opposite open end of the filler is a cover 38, secured thereto by means of a screw 40, extending downwardly around the outer periphery of the member 36 and spaced therefrom. The lower edge of the cover 38 is provided with fins 42. The cover 38 has been shown in two pieces to facilitate manufacture but it is to be understood that it may be formed from one integral member. Openings 44 are provided in the side of the member 36 and a sleeve 46 supported between the cover 38 and the upper end of

the member 32 is adapted for angular movement for closing or opening the openings 44; there being openings 48 in the sleeve 46 shown aligned with the openings 44 to form an air passage. A struck up member 50 projecting thru a slot 52 in the cover 38 provides a means for angularly moving the sleeve 46 to open or close the openings 44. Secured to the cover 38 is a cap 54, hinged at 56, adapted to close the open end of the filler. A resilient lip 58 engages a depression 60 on the cover 38 to hold the cap in closed position.

At the rear end of the motor and above the crankcase chamber is a passage 62 communicating with the valve tappet chamber 64. A tail pipe 66 directed rearwardly and downwardly forms a conduit communicating with the passage 62. A baffle 68 is shown to divert the flow of air thereby catching any lubricant which might be carried with the air current and returning it to the valve chamber or crankcase.

The valve mechanism 24 is secured in the chamber 64 by supports 70 and extends thru an opening 72 which forms a communication between the valve chamber 64 and crankcase chamber 26.

It will be understood that when the engine is in operation considerable pressure is formed under the hood of an automobile due to the cooling fan, not shown, and particularly when the automobile is in forward motion. This pressure causes an air current to enter the filler past the fins 42 which separate dirt therefrom. The air passes upwardly in the space between the filler and its cover thru the openings 44 and 48 into the filler and from there into the crankcase chamber. By directing the opening between the filler and crankcase in the direction of rotation of the crankshaft, the latter will help to draw the air into the crankcase similar to the action of a blower or fan. The rotation of the crankshaft and its associated connecting rods causes a circular motion of the air and due to the centrifugal force thereof and design of the crankcase chamber the air current is directed into the valve chamber 64 thru the openings 72.

The exhaust being located above and rearwardly of the inlet passage permits the current of air to work its way upwardly and rearwardly in the crankcase as well as the valve chamber carrying with it any vapors in either chamber and directing them under the engine and vehicle before they are condensed.

The tail pipe 66, being open rearwardly and below the hood compartment of the vehicle, is not subjected to the hood pressure as the inlet opening but is subjected to a suction when the vehicle is in forward motion.

While one particular adaptation of my invention has been illustrated and described in detail, it is to be understood that various changes including size and arrangement of parts may be made without departing from the spirit thereof and it is not my intention to limit its scope other than by the terms of the appended claim.

What I claim is:

In an engine of the class described, a crankcase chamber, a valve chamber above said crankcase chamber communicating therewith, means for directing an air current into said crankcase at its forward end, and at one side thereof means for directing the air current circularly within said crankcase, and means for exhausting the air current at the rear end of said valve chamber at the opposite side of the inlet opening.

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