Feb. 5, 1929. 1,701,405

E. A. DE WATERS

CRANK CASE VENTILATION

Filed Jan. 2, 1926

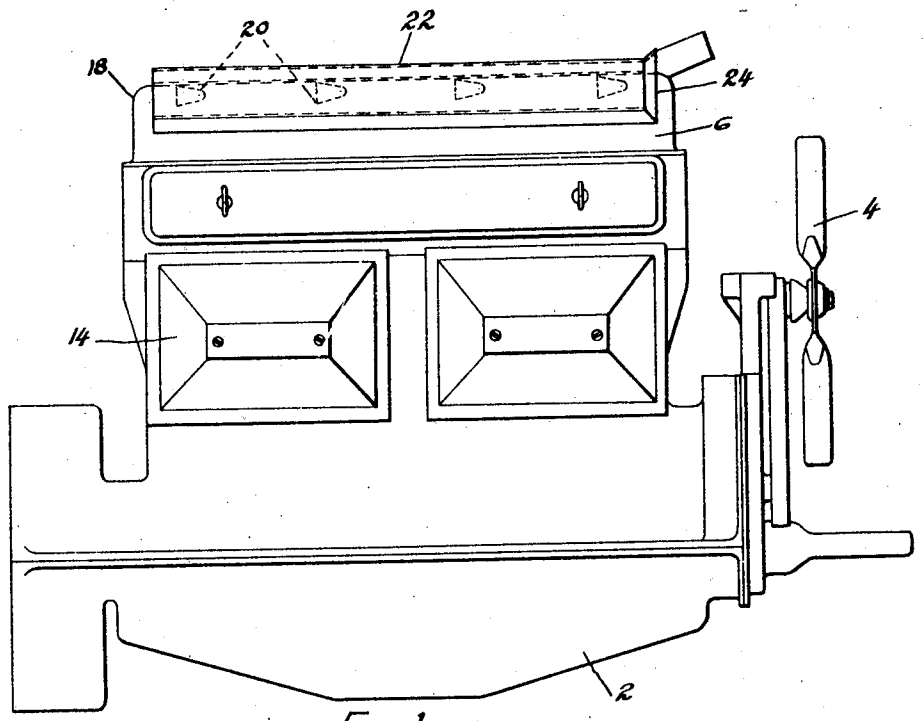


Fig. 1

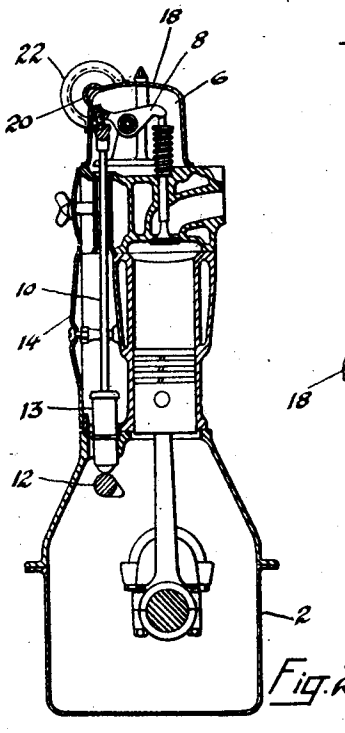


Fig. 2

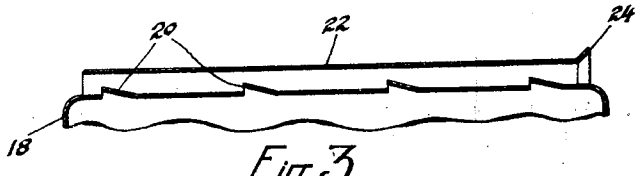


Fig. 3

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UNITED STATES PATENT OFFICE.

ENOS A. DE WATERS, OF FLINT, MICHIGAN, ASSIGNOR TO GENERAL MOTORS CORPORATION, OF DETROIT, MICHIGAN, A CORPORATION OF DELAWARE.

CRANK-CASE VENTILATION.

Application filed January 2, 1926. Serial No. 78,915.

It is the object of this invention to provide a simple, cheap construction for effectively removing vapors from the crankcase of an internal combustion engine. As is well known these vapors consist of particles of oil in the form of a fine mist, and combustion chamber products which leak past the pistons, these products consisting principally of burnt gases and a small proportion of water vapor. If allowed to remain in the crankcase, the combustion chamber products condense and effect a dilution of the lubricating oil which is very undesirable.

According to my invention suction is applied to a compartment in communication with the crankcase and housing auxiliary mechanism. This suction results in drawing vapors out of the crankcase by way of the compartment and removing them from the engine.

My particular construction consists in applying over the louvered openings in the cover for the overhead valves, such as shown in my prior application Ser. No. 693,634, filed Feb. 18, 1924, a tubular member through which a stream of air is passed, this stream inducing a flow of vapors out of the valve compartment. While the flow of air may be produced in a number of ways I have preferred to employ a portion of the air stream produced by the action of the usual cooling fan as well as the motion of the vehicle and have provided the tubular member with a funnel shaped portion facing in the direction of the air stream to facilitate the reception of the air.

In the drawings:

Figure 1 is a side elevation of a Buick engine showing my ventilating device applied thereto.

Figure 2 is a section through the engine showing the path of the crankcase vapors.

Figure 3 is an enlarged longitudinal section through the ventilating device.

In the drawing, the reference character 2 indicates the crankcase, 4 the usual cooling fan, and 6 the valve compartment. It will be noted that the engine illustrated is provided with overhead valves but the invention is equally applicable where the valve compartments are arranged alongside the cylinders. The valve mechanism comprises customary rocker arms 8 and tappet rods 10 extending into the crankcase where they are engaged by the usual cam shaft 12. The tappet rods are provided with suitable guides 13 fitting in a notched seat in the top of the crankcase permitting the passage of vapors from the crankcase through the tappet rod compartment 14 to the valve compartment 6. If desired other openings may also be provided in the top of the crankcase for the passage of vapors.

I have provided the cover 18 of the overhead valve compartment with hooded apertures 20 formed by pressing out portions of the metal of the cover. Over these apertures I have arranged a tubular member 22 through which an air stream is passed to cause a flow of vapors out of the openings 20 and their discharge away from the engine. While the stream of air may be secured in a number of ways, as by the use of engine suction, I have preferred to make use of the blast of the usual cooling fan 4, as well as the stream of air resulting from the motion of the vehicle. In order to best utilize these currents I have provided the forward end of member 22 with an outwardly flared or funnel shaped portion 24 for collecting the currents of air and conducting them into the tube. The other end of the tube is preferably open so that the products drawn out of the valve chamber are discharged outside of the engine, although it is obvious that if desired these products might be led to the intake manifold for consumption in the engine.

In operation, the air stream passing through the member 22 induces a flow of vapors from the crankcase upwardly through the tappet rod compartment 14 and valve chamber 6 and through openings 20 into the passing air current. It will also be noted that the manner of formation of the hooded openings 20 is such that the cross section of the passage through the tubular member is reduced adjacent the openings 20 so that the air stream is moving with higher velocity at these points with consequent greater aspirating effect. Attention is also called to the fact that the openings 20 are distributed along the length of the engine so that vapors throughout the length of the crankcase are subjected to suction.

I claim:

1. An internal combustion engine having a crankcase, a compartment for auxiliary mechanism in communication with the crankcase, a cover for said compartment, an opening in said cover, and a tubular member ex-

tending along said cover and over said opening, said tubular member being adapted to convey an air current over said opening to draw vapors therefrom.

2. In the combination as defined by claim 1, said opening being provided with a hood, the hood projecting into said tubular member, reducing the cross section of the air passage, and increasing the velocity of air flow past the opening.

3. In the combination as defined by claim 1, said engine being provided with the usual cooling fan and said tubular member having the end adjacent the fan of enlarged cross section for receiving the fan blast.

4. An automobile engine having a crankcase, a valve compartment communicating with the crankcase, a cover for said compartment, said cover being provided with a plurality of openings distributed along the length of the engine, and a tubular member extending along said cover and overlying said openings, said tubular member being adapted to convey an air current over said openings to draw vapors therefrom.

5. An automobile engine having a crankcase, a valve compartment in communication with the crankcase, a cover for said valve compartment, said cover being provided with a pressed out portion forming a hooded opening and an open ended tubular member extending along said cover and overlying said opening, said tubular member being adapted to convey an air current over said opening to draw vapors therefrom.

6. The combination as defined in claim 5, said tubular member being provided with a funnel shaped entrance portion facing in the direction of the air current.

7. An internal combustion engine having a crankcase, a valve compartment, said engine being formed with a plurality of passages spaced longitudinally of the engine establishing communication between the valve compartment and the crankcase, a cover for said compartment, said cover being provided with a plurality of openings distributed along the length of the engine, and a tubular member extending along said cover and overlying said openings, said tubular member being adapted to convey an air current over said openings to draw vapors therefrom, the distribution of said passages and openings causing the ventilating stream to traverse substantially the entire cross sectional area of the crankcase.

In testimony whereof I affix my signature.

ENOS A. DE WATERS.