

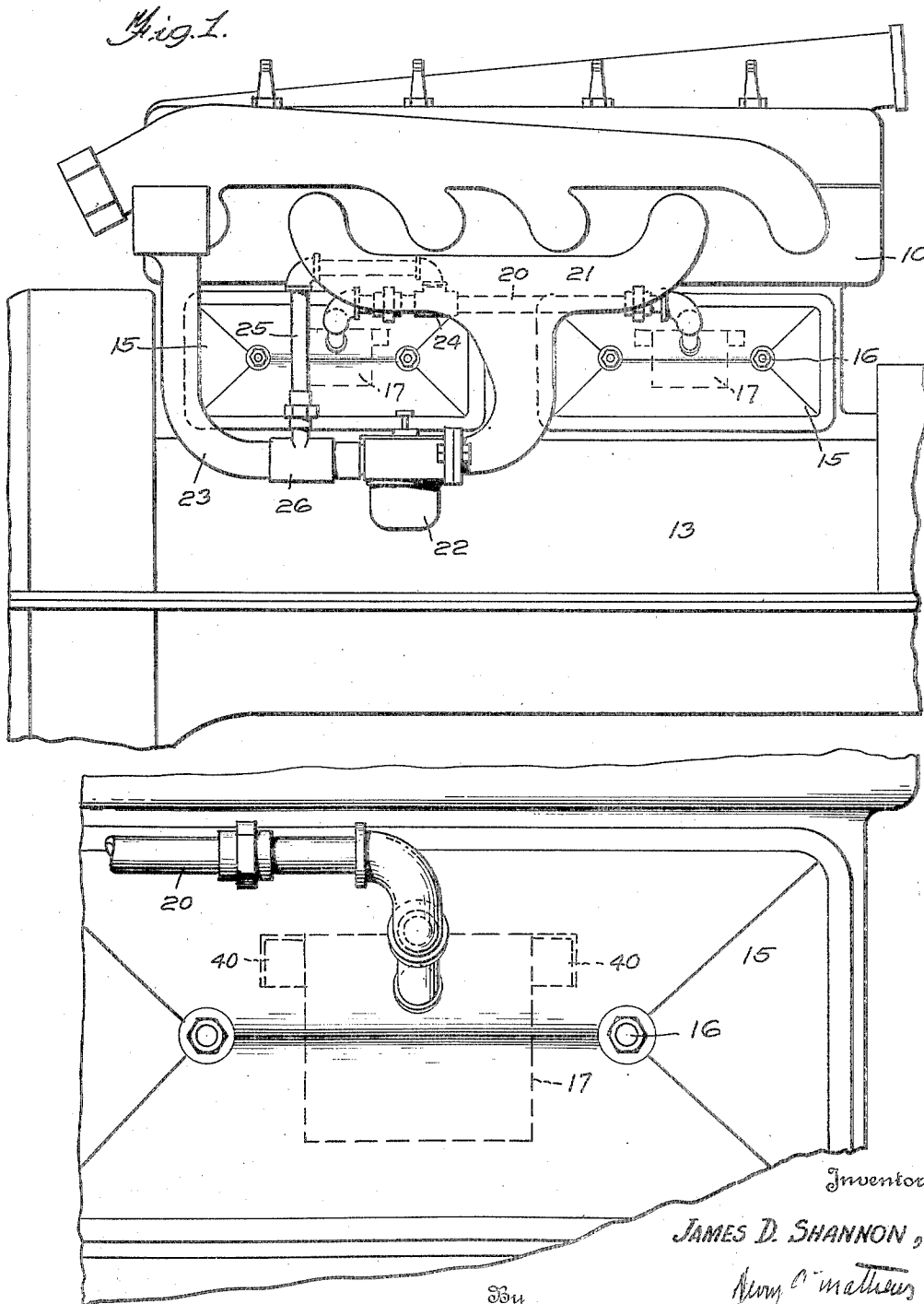
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J. D. SHANNON
CRANK CASE VENTILATOR

Filed Dec. 13, 1926

2 Sheets-Sheet 1



Inventor

JAMES D. SHANNON,

James D. Shannon

Attorney

Dec. 27, 1927.

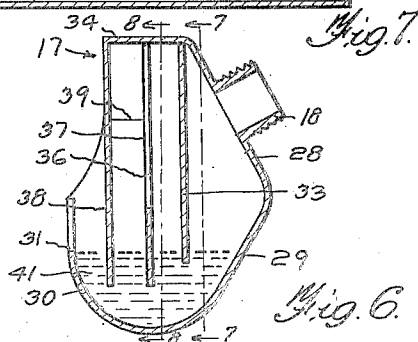
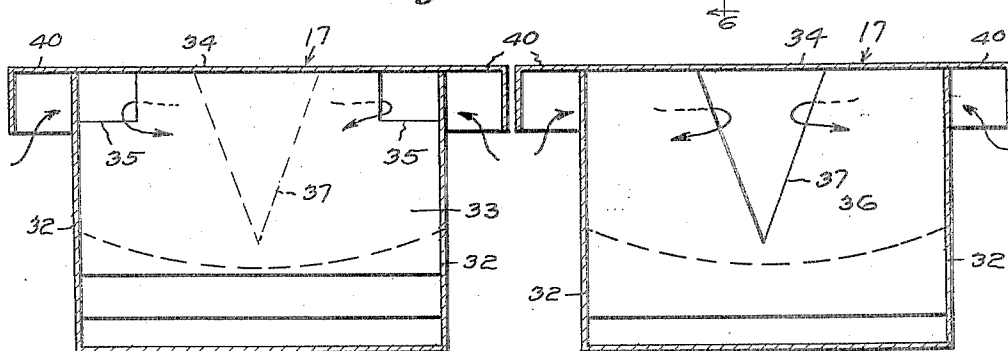
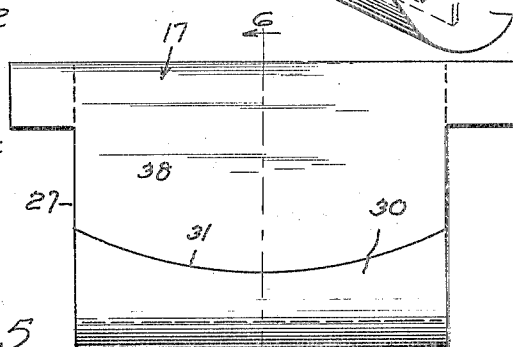
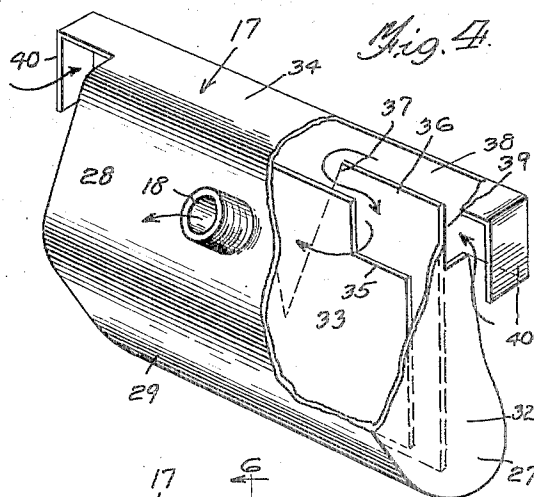
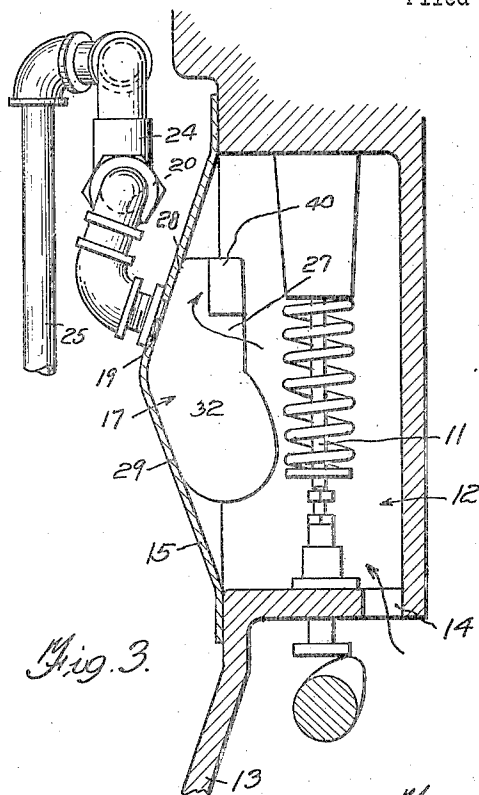
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J. D. SHANNON

CRANK CASE VENTILATOR

Filed Dec. 13, 1926

2 Sheets-Sheet 2



Inventor

JAMES D. SHANNON,

Jerry A Mathews

Attorney

UNITED STATES PATENT OFFICE.

JAMES D. SHANNON, OF DINES, WYOMING.

CRANK-CASE VENTILATOR.

Application filed December 13, 1926. Serial No. 154,612.

My invention relates to ventilators for the crank cases of internal combustion engines.

The advantages of the crank case ventilation are recognized, and the engines of automobiles are provided with different types of ventilators.

In accordance with my invention, I provide a crank case ventilating means whereby fresh air is drawn into the crank case, through the breather opening, upon one side of the engine, and withdrawn from the crank case from the opposite side of the engine. The device is connected up with the intake side of the carburetor, and the desired suction is obtained from the carburetor. The ventilating means maintains the oil suitably cool, preventing overheating of the same whereby the oil maintains its proper thickness or body and the hot air, smoke or gases, ordinarily present in the crank case, are withdrawn from the same. The oil thus treated in the crank case will possess the proper lubricating properties and the compression of the engine will be increased, with the resultant increase in speed and power, in the operation of the engine. In the embodiment of my invention, the heated gases are withdrawn from the crank case and pass into and through separator or separators, located in the tappet chambers. The excess oil is separated from the gases and collected in the separators and returned to the crank case, while the heated gases pass to the intake of the carburetor, and aid in the proper vaporization of the incoming gasoline mixture.

In the accompanying drawings, forming a part of this specification, and in which like numerals are employed to designate like parts throughout the same,

Figure 1 is a side elevation of apparatus embodying my invention, showing the same applied to an internal combustion engine of the poppet valve type,

Figure 2 is an enlarged side elevation of one of the tappet chamber plates, with the separator arranged behind the same,

Figure 3 is a transverse section through the tappet chamber, showing the separator arranged therein,

Figure 4 is a perspective view of the separator,

Figure 5 is an elevation of the inner side of the separator,

Figure 6 is a transverse section taken on line 6—6 of Figure 5,

Figure 7 is a longitudinal section taken on line 7—7 of Figure 6, and,

Figure 8 is a similar view taken on line 8—8 of Figure 6.

In the drawings, wherein for the purpose of illustration, is shown a preferred embodiment of my invention, the numeral 10 designates the cylinder block of an internal combustion engine of the poppet valve type. The poppet valves are actuated by tappet rods 11, arranged in tappet chambers 12, Figure 3. The tappet chambers are in communication with the crank case 13 of the engine, upon one side of the engine, through openings 14 at the bottom of the tappet chambers. A breather opening, such as the usual opening through which the oil is fed into the crank case, is arranged upon the opposite side of the crank case 13. The tappet chambers 12 are covered by plates 15, which are removable, and held in place by bolts 16 or the like.

In accordance with my invention, I arrange a separator 17 in each tappet chamber 12, and this separator is disposed outwardly of the tappet rods 11, so as not to interfere with the operation of the same. The separator embodies an outer shell carrying upon its outer side a tubular coupling 18, extending through an opening 19 formed in the tappet chamber plate 15. The tubular couplings 18 extend to the exterior of the plates 15. Suitably connected with the tubular coupling 18, to the right, is a pipe 20, the opposite end of which is suitably connected with the tubular coupling 18, to the left. The pipe 20 is arranged exteriorly to the plates 15 and preferably behind the intake manifold 21, which leads to the outlet side of the carburetor 22, having an intake pipe 23, passing to its intake side. Connected with the pipe 20 by means of a T-coupling 24, or the like, is a pipe 25, connected with the pipe 23 by means of a T-coupling 26.

The separators 17 are identical, and each embodies an outer casing 27, having an outer flat side 28 and a bottom 29, curved in cross section, as clearly shown in Figure 6. The bottom 29 is continued upwardly upon the inner side of the shell to provide a side 30, the edge of which is preferably curved, as shown at 31. The tubular coupling 18 passes through the outer side 20, adjacent to its center. The ends of the casing are closed by end walls or heads 32, as shown. Arranged

within the casing 27 adjacent to the tubular coupling 18 is a longitudinal vertical baffle 33, forming a gas-tight joint with the top 34 of the casing and the end walls 32. This baffle is spaced from the bottom 29, as shown. The baffle is provided at its top and at its ends with inlet openings 35, cut therein, as shown. The numeral 36 designates an intermediate longitudinal vertical baffle, the ends of which form a gas-tight joint with the end walls 32 and the upper end of which forms a gas-tight joint with the top 34. The lower end of this intermediate baffle is spaced from the bottom 29. The intermediate baffle is provided centrally thereof with a V-shaped opening 37, decreasing in width downwardly, as shown. The numeral 38 designates an outer baffle vertically arranged and extending longitudinally of the casing. This outer baffle has a gas-tight joint with the end walls 32 and with the top 34. The baffle 38 is spaced at its lower end from the bottom 29. The end walls 19 are provided at their upper ends with air inlet openings 39. These openings lead to the space between the baffles 36 and 38 and have no direct communication with the space between the baffles 33 and 36. The openings 39 are preferably covered by guards 40. It might be stated at this point that heated gases or air laden with the particles of oil pass into and through the separator and by contact with the several vertical baffles, the larger particles of the oil are separated from the gases and pass downwardly upon the baffles and are collected in the bottom 29 of the casing. This provides an elevation of oil, indicated at 41 and the baffles extend between this elevation of oil whereby a trap or seal is provided, preventing the gases from passing around the bottom ends of the baffles. The level of the oil is maintained by the collected oil overflowing the edge 31 whereby it passes to the bottom of the tappet chamber 12 and hence returns to the crank case.

The operation of the apparatus is as follows:

During the operation of the engine, the suction in the carburetor intake pipe 23 is transmitted to the pipe 25 and from this pipe through the pipe 20, to the interior of the separators 17. The fresh air enters the crank case of the engine upon one side, through the breather opening and passes across the crank case and becomes laden with the heated gases or vapors arising from the oil and then passes upwardly, through the openings 14 in the tappet chambers on the other side of the engine. The heated gases laden with the particles of oil now enter the separators through the openings 39 and travel inwardly longitudinally to the baffle 33 until the central opening 37 is reached and then outwardly longitudinally of the space between the baffles 36 and 33, until the open-

ings 35 are reached, and then inwardly longitudinally to the baffles 33 until the coupling 18 is reached. During this travel of the gases the particles of oil contacting with the baffles are separated out from the gases and are collected in the bottom of the separator, and subsequently returned to the crank case, as above explained. The heated gases passing through the couplings 18 are fed to the intake pipe of the carburetor, and aid in the proper vaporization of the incoming charge of gasoline traveling to the carburetor.

It is to be understood that the form of my invention, herewith shown and described, is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangements of parts may be resorted to without departing from the spirit of my invention or the scope of the subjoined claims.

Having thus described my invention, I claim:—

1. A device for separating particles of oil from heated gases, comprising a relatively thin shell adapted to be mounted in the tappet chamber of an internal combustion engine, said shell having one side closed and its opposite side open and a bottom extending adjacent to the open side, the upper edge of the bottom constituting an overflow level for the shell at the open side, a plurality of spaced baffles arranged within the shell and extending longitudinally thereof and having their lower ends spaced from said bottom, said bottom holding the collected oil and the baffles extending into the oil below the level thereof for producing a seal, inlet means leading into the shell adjacent the open side thereof and between the baffles, and an outlet leading into the shell adjacent to the closed side.

2. A device for separating particles of oil from heated gases, comprising a shell adapted to be arranged within the tappet chamber of the internal combustion engine, said shell having one side closed and its opposite side open and a bottom extending adjacent to the open side for forming an overflow wall, three baffle plates extending longitudinally within the shell and laterally spaced from each other, the intermediate baffle plate being provided with a central opening formed therein, the baffle plate adjacent the closed side of the shell being provided with openings at its ends, inlet openings formed in the ends of said shell and leading into the same between the intermediate baffle and the baffle adjacent to the open side of the shell and an outlet connected with the closed side of the shell and leading into the shell upon the outer side of the baffle arranged adjacent to such closed side and between the openings at the ends of such baffle.

In testimony whereof I affix my signature
JAMES D. SHANNON.