Dec. 15, 1942. B. J. MUENK 2,305,186

ENGINE VENTILATING

Filed June 5, 1940

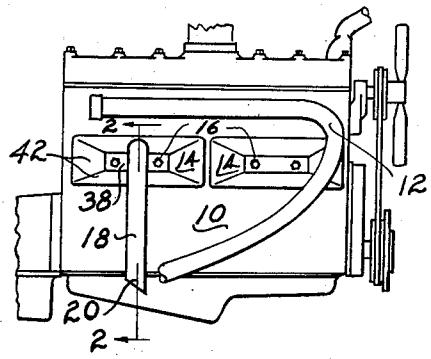


Fig. 1

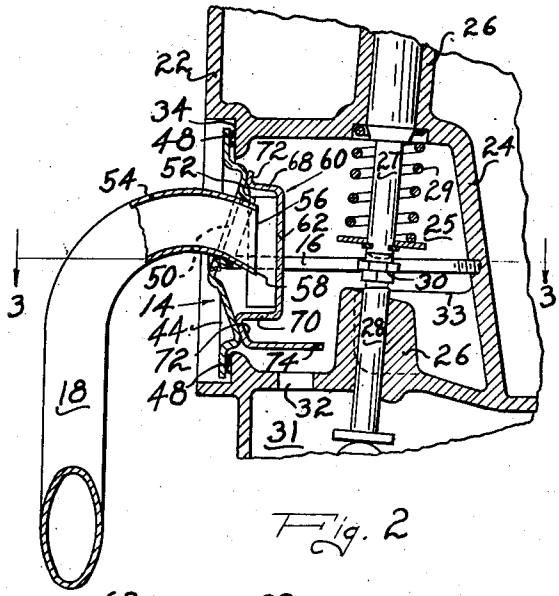


Fig. 2

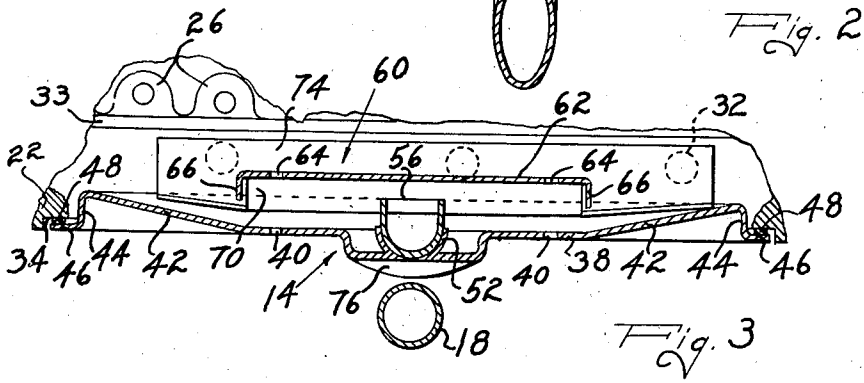


Fig. 3

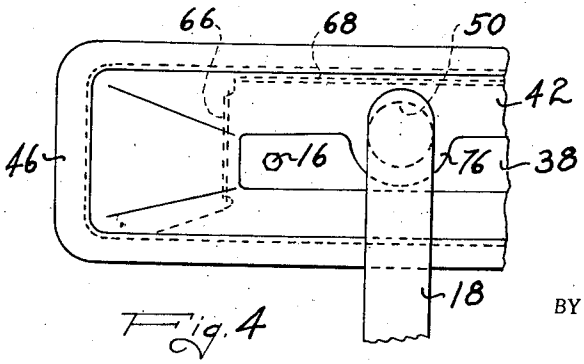


Fig. 4

INVENTOR.
BERNARD J. MUENK.

BY Carl J. Barbee

ATTORNEY.

Patented Dec. 15, 1942 2,305,186

UNITED STATES PATENT OFFICE

2,305,186

ENGINE VENTILATING

Bernard J. Muenk, Kenosha, Wis., assignor to Nash-Kelvinator Corporation, Kenosha, Wis., a corporation of Maryland

Application June 5, 1940, Serial No. 338,865

6 Claims. (Cl. 121—194)

This invention relates to engine ventilators and has particular reference to means for providing a vent from the crank case of an internal combustion engine to the atmosphere outside of the engine.

It is an object of this invention to provide a vent which will adequately remove fumes and air from a crank case without allowing excessive quantities of oil to escape from the engine.

It is another object of this invention to provide novel means for baffling a vent to prevent the escape of oil therethrough.

It is another object of this invention to provide a vent pipe which will act as a condenser to return lubricant to the engine.

Other objects and advantages of this invention will be apparent from a consideration of the following specification and claims and the attached drawing of which there is one sheet and in which—

Figure 1 represents a side elevation of an internal combustion engine;

Figure 2 represents a section taken along the plane indicated by the line 2—2 of Figure 1 and looking in the direction of the arrows;

Figure 3 represents a horizontal section taken along a plane indicated by the line 3—3 of Figure 2 and looking in the direction of the arrows;

Figure 4 represents an enlarged side elevation of a portion of the valve cover plate and breather tube illustrated in Figure 1.

In Figure 1 I have illustrated an internal combustion engine 10 provided with an exhaust pipe 12 and two valve chamber cover plates 14 secured to the engine by means of bolts 16. The rear cover plate 14 is provided with a breather tube 18 for removing dangerous fumes and gases which may blow by the pistons and valves of the engine and collect in the engine. The breather tube 18 extends to a low point beside the engine and is tapered upwardly on the back side as indicated at 20 so that the stream of air thrown backward from the cooling fan will act to draw the fumes out of the tube. The fumes consist of water vapor, exhaust gases and partially burned fuel and air which might explode and would dilute the lubricating oil if allowed to remain in the engine.

More specifically the engine 10 consists of a casting having a side wall 22 (see Figures 2 and 3) which is recessed at 24 to form a valve chamber 25. The top and bottom walls of the chamber 25 are provided with bosses 26 which are apertured to form guides for valve stems 27 and valve push rods 28. Chamber 25 is adapted to house the valve springs 29 and valve adjusting mechanism 30 which are commonly used in automotive construction today. The lower wall of the recess chamber 25 separates the valve chamber from the crank case and cam shaft space 31 which is in open communication with the oil pan and oil storage space (not shown). The lower wall of the chamber 25 is apertured as at 32 to permit oil splash and oil vapors to rise from the crank case chamber 31 to the valve chamber 25 and lubricate the valve guides and valve mechanism. Lubricant is also fed to the valve chamber under pressure where it collects behind dams 33 until it fills up over the sloping tops of the lower bosses 26 to lubricate the push rods 28. Apertures 32 form a return passage for excess oil spilling over the dams 33 to return to the crank case.

The side wall 22 of the engine is shaped to provide a recessed shoulder 34 around the valve chamber 25, which shoulder forms a seat for valve cover plate 14. The valve cover plate functions to keep dust and moisture from the valve mechanism and to prevent the excessive loss of lubricant from the valve chamber 25.

Since the crank case 31 often becomes filled with burned and partially burned gases which blow by the pistons and valves of the engine, particularly in older engines, these gases are free to rise through the apertures 32 into the valve chamber 25, and it has been the practice to provide a breather tube similar to my breather tube 18 through which these gases could escape. However, I have found that in addition to allowing the gases to escape, a considerable quantity of oil and oil vapor is carried out of the breather tube, and it is toward preventing this loss of lubricant to which my invention is directed.

The valve cover plate consists of a stamping having a flat central surface 38 apertured at 40 to provide space for the bolts 16 which are threaded into the inner wall 24 of the valve chamber 25. On all sides of the flat surface 38 the cover plate 14 is bent back in sloping planes 42 which terminate at their outer edges in the outturned flange 44 which is carried continuously around the plate. The flange 44 is turned down in a flat flange 46 which seats against the shoulder portion 34 of the engine to close the valve chamber 25. I have provided a gasket 48 between the flange 46 and the surface 34 to insure a tight seal between the surfaces.

The upper sloping plane 42 which slants downwardly and outwardly to the flat surface 38 is apertured at 50, and the sides of the aperture

are inwardly flanged as at 52. Positioned within the flanged aperture 50 and normal to the upper sloping surface 42 is breather tube 18 which may be secured in the aperture 50 by press fitting or welding and which is formed with an upper curved portion 54. Since the flanged opening 50 is in the surface 42 which slants outwardly from the valve chamber 26, it is apparent that the curved portion 54 of the breather tube will extend first in an upward direction from within the valve chamber and then downward to the lower end of the tube. The inner end of the breather tube 18 is cut off in a vertical plane as shown at 56 rather than in a plane at right angles to the axis of the tube at that point. This construction of the breather tube causes any oil vapors which may be carried into the tube with the combustion gases to impinge upon the walls of the breather tube. Since the greater part of the curved section 54 of the breather tube is outside of the valve chamber 25 and subject to the cooling action of the fan, a great deal of this lubricant vapor will be condensed and will drain back down the curved section of the breather tube to the lip 58 at the lower side of the inner end 56 of the breather tube. Oil vapors condensing within this length of tube 18 will drain to the bottom thereof and will drip off the lower lip, the lowest point on the tube. If the end were cut off square, some drippings might fall directly across the path of the vented vapors and be carried out by the rush of gases.

To further prevent excessive escape of lubricant through the breather tube, I have provided a baffle generally indicated at 60 on the inside of the cover plate 14 and over the mouth 56 of the breather tube 18. Baffle 60 consists of a central flat plate 62 apertured at 64 to pass the bolts 16. The edges of the flat plate 62 are all bent outwardly to form end walls 66, top wall 68, and bottom wall 70. It will be noted that the top wall 68 and bottom wall 70 are slightly longer than the end walls 66 so that the end walls 66 do not touch the cover plate 14 and that the walls are not joined at their corners, thus providing spaces through which the fumes within the valve chamber 25 may pass to reach the breather tube. Upper wall 68 and lower wall 70 are turned over in slanting flanges 72 which are secured to the slanting surfaces 42 of the cover plate as by welding. The lower flange 72 of the baffle is further bent inwardly in an enlarged horizontal baffle 74 which extends over the apertures 32 in spaced relationship therewith to prevent an excessive amount of lubricant from being splashed into the valve chamber by the action of the crank shaft and cam shaft.

From the above description it should be apparent that the fumes being exhausted from the valve chamber 25 together with any entrained lubricant vapor must pass between the sides 66 of the baffle 60 and cover plate 14. From this passage the fumes and vapor move generally horizontally to the mouth of the breather tube, at which point they must change direction and pass through the breather tube. By directing the gases in this path I have decreased the velocity of the gases over the lip 58 so that there is no tendency to pick up and carry out lubricant which has condensed in the curved portion of the breather tube and drained back toward the valve chamber 25. Should the sloping surface 42 of the cover plate 46 be too small to provide space for the aperture 50, the sloping surface 42 may be continued for a short distance by pressing out a portion of the flat surface 38 as is indicated at 76.

While I have described my invention in some detail, I intend this to be an example only and not limiting on my invention to which I make the following claims:

1. A breather device for an engine comprising a cover plate, a breather tube extending in a smooth curve through said plate, first upwardly to a high point on one side of said plate and then downwardly, the end of said tube on the opposite side of said plate from said high point terminating in a vertical plane spaced from said plate, and means positioned adjacent to said last mentioned end for obstructing vertical flow of vapors to said end of said breather tube.

2. A breather device for an engine comprising a cover plate, a baffle plate secured to one side of said cover plate and spaced therefrom, and a breather tube extending through said cover plate and having an end terminating in a vertical plane lying in the space between said cover plate and baffle plate, said tube extending upwardly from said end and having another end which is bent downwardly and terminates below said first mentioned end.

3. A breather device for an engine comprising a cover plate, a channel-shaped baffle plate secured to one side of said cover plate along the top and botton edges of said baffle and having its central portion spaced from said cover plate, said baffle plate having side edges extending toward but terminating in spaced relation to said cover plate, said cover plate and baffle plate together forming an elongated chamber open at its ends, and a breather tube extending from said elongated chamber through said cover plate.

4. A breather device for an engine comprising a cover plate, a channel-shaped baffle plate having flanged top and bottom edges secured to one side of said cover plate, legs on each end of said baffle plate, said legs being narrower than the width of said channel and extending from said baffle plate toward but terminating in spaced relation to said cover plate, and a vent tube supported by said cover plate and extending therethrough and terminating in the space between said baffle plate and cover plate.

5. A breather device for ventilating a chamber having an inlet comprising a cover plate, a breather tube extending through said cover plate, a baffle secured to one side of said cover plate and spaced therefrom, and a flange formed on the bottom of said baffle and adapted to extend completely over said inlet, said baffle extending over one end of said tube.

6. A breather device for ventilating a chamber having an inlet in the lower wall thereof comprising a cover plate adapted to close said chamber, a breather tube extending through said cover plate, a baffle supported by said cover plate in spaced relation therewith and over one end of said breather tube, and a flange formed on said baffle extending completely over said inlet in spaced relation thereto.

BERNARD J. MUENK.