

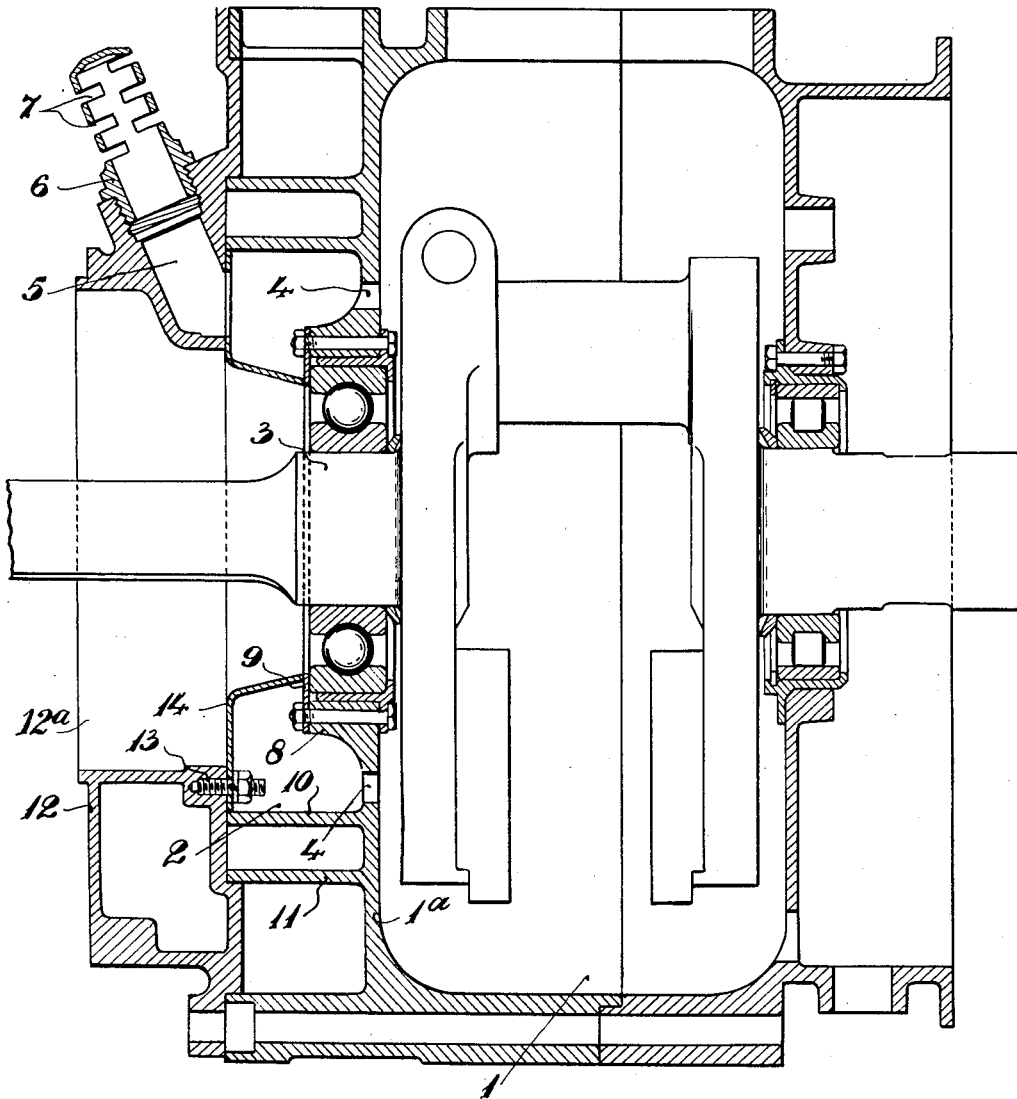
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MEANS FOR VENTILATING THE CRANK CASES OF INTERNAL COMBUSTION ENGINES

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# UNITED STATES PATENT OFFICE

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## MEANS FOR VENTILATING THE CRANK CASES OF INTERNAL COMBUSTION ENGINES

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2 Claims. (Cl. 121—194)

This invention relates to means for ventilating the crankcases of internal combustion engines, and particularly the crankcases of engines of the radial type.

5 An object of the present invention is to provide for the free passage of gas or vapour from the crankcase to the atmosphere while ensuring the interception and draining back to the crankcase of any excess oil that may be carried by or suspended in the said gas or vapour, whereby economy of oil and a clean exterior of the engine are obtained.

10 According to the invention, a vapour-receiving chamber is provided exteriorly of the crankcase, the said chamber being in communication with the atmosphere, and also being in communication with the interior of the crankcase by means of suitable apertures or passages arranged so as to allow vapour or gas from the crankcase to enter the said chamber and also so as to allow excess oil carried over with the vapour to drain back into the crankcase.

15 The accompanying drawing represents a vertical section through the crankcase of an engine of the radial type, provided with an exterior vapour-receiving chamber in accordance with this invention.

20 Referring to the drawing, the side 1<sup>a</sup> of the crankcase 1 is provided with an annular chamber 2 surrounding and concentric with the axis of the crank-shaft 3, the said annular chamber 2 being exterior to the crank chamber and being in communication with the interior of the latter by means of a series of circumferentially spaced holes 4 in the wall 1<sup>a</sup> of the crankcase, some of these holes being above the crank-shaft and others below the same. The annular chamber 2 is also in communication with the atmosphere through a passage 5 leading from the upper part of the chamber, the outlet end of this passage 40 5 being fitted with an outside cap 6 formed with openings or apertures 7.

50 The annular chamber 2 is formed by additional parts attached to the crank-case. Thus, in the arrangement illustrated the wall 1<sup>a</sup> of the crankcase is provided, around the central opening which receives the ball bearing races for the crank-shaft, with an outwardly-extending annular boss or flange 8 forming a bearing housing and to the outer face of which is attached a retaining ring or plate 9 overlapping the outer bearing race, while at a little distance outwards of the flange 8 the wall of the crank-case carries a pair of outwardly-extending annular walls or 55 flanges 10 and 11 which are concentric with but

longer than the said flange 8. Applied to and clamped against the outer edges of the walls or flanges 10 and 11 is an annular external cover 12 suitably attached to the crankcase and having a large central opening 12<sup>a</sup>, the edge of which is situated at a suitable distance inwards of the part 13 of the crank-case. Attached to the inside face of this external cover 12, by studs or bolts 13, is an angular sectioned ring or plate 14 having an inner part extending towards the crank-case wall so as to make close contact with the race retaining ring 9 secured to the bearing housing flange. Thus, the plate 14 forms with the side of the crankcase and flange 10, together with the parts 8 and 9, the annular chamber 2, 70 which is placed in communication with the crankcase by the openings 4. The passage 5 leading to the atmosphere is formed through the upper part of the annular cover 12, the said passage being open, at its lower end, to the interior 75 of the chamber 2. The outlet cap 6 may be screwed into the upper end of the passage 5, as shown.

80 When the engine is running, vapour from the crank chamber 1 passes through the holes 4 into the annular chamber 2 since the air in chamber 2 is cooler than that in chamber 1, the vapor will be cooled and any excess oil carried over by said vapour will tend to drain to the bottom, such oil collecting in the lower part of the chamber 2 and draining back to the crank chamber 1 by way of the lower holes, the vapour itself escaping to the atmosphere.

85 Having fully described my invention, what I desire to claim and secure by Letters Patent is:— 90

1. In combination with a crankcase having a wall provided with a crankshaft opening, a flange integral with and projecting from the crankcase wall, said flange surrounding said crankshaft opening and an angle-sectioned ring comprising a pair of flanges, one of the last-mentioned flanges co-operating with the first-mentioned flange and the other one of the last-mentioned flanges engaging the crankcase wall to form an external annular vapour-receiving chamber, said ring having an opening placing said chamber in communication with the atmosphere, the wall of the crankcase having a series of holes placing the latter in communication with said chamber.

100 2. In combination with a crankcase having a wall provided with a crankshaft opening, a flange integral with and projecting from the crankcase wall, said flange surrounding said crankshaft opening, an angle-sectioned ring comprising a pair of flanges, one of the last-mentioned flanges 110

co-operating with the first-mentioned flange and the other one of the last-mentioned flanges engaging the crankcase wall to form an external annular vapour-receiving chamber, said ring having an opening placing said chamber in communication with the atmosphere, the wall of the crankcase having a series of holes placing the latter in communication with said chamber; and an outer cover serving to secure said angle-sectioned ring to the crankcase, said cover having a passage at its upper end communicating with the atmosphere and with the opening in the ring.

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