

# United States Patent

[11] 3,550,567

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[54] **AUXILIARY BREATHER**  
**3 Claims, 3 Drawing Figs.**

[52] U.S. Cl..... 123/41.86,  
 92/78, 92/80, 92/82

[51] Int. Cl..... F02f 9/04,  
 F15b 21/04

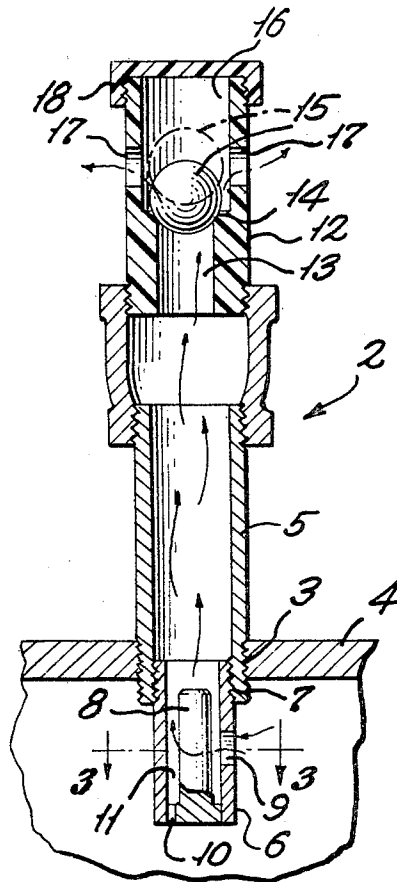
[50] Field of Search..... 123/41.86,  
 191CP, 119B; 92/82, 80, 78, 261

**ABSTRACT:** This invention relates to improvement in breather and bearings for a large one-cylinder type of oil field engine, though there are other places where these may apply and may be used.

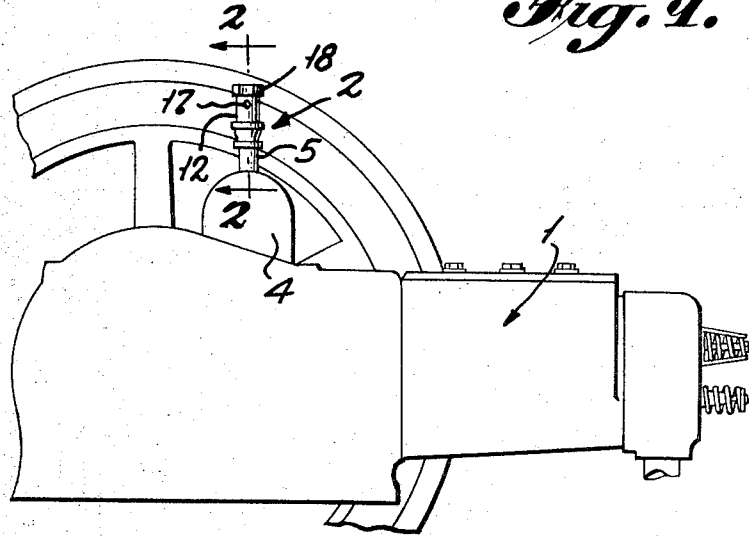
The object of the breather is that it provides a relatively compact and easily installed, control device which separates the oil from the vapors and then returns the oil to the crankcase. This lets oil-free vapors escape whenever there is pressure in the crankcase, but checks backflow of air into the crankcase.

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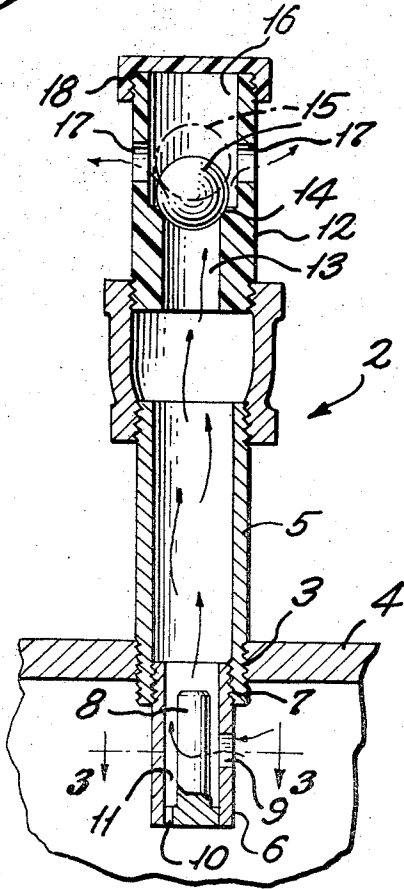
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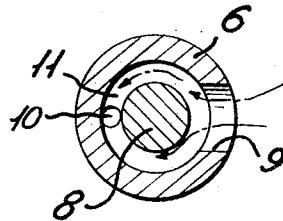
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



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## AUXILIARY BREATHER

There are a large number of these engines in operation that have been operating 24 hours a day for many years. A real problem with this engine has been a lack of proper crankcase ventilation and abnormal wear where valve pushrod slides continuously in the opening in the cast iron crankcase. There has never been a bearing in this opening. This pushrod opening in the crankcase wears to the extent that it allows excessive intake and output of air making the breathing of the crankcase increasingly difficult because of this wear.

Because of the nature of this engine, with external pushrod and valve controls, there is no possible means for crankcase ventilation through valve chambers as provided in most other engines. Breathing of this engine therefore must be accomplished directly from the crankcase, where large turbulence of crankcase vapors are in constant circulation. Therefore a means of separating the oil from the vapors before vapor is released to the atmosphere is a must. During part of the engine revolution there is pressure in the crankcase, and during the remainder of the cycle it is advantageous to create a partial vacuum in the crankcase.

FIG. 1 shows the engine with auxiliary breather installed.

FIG. 2 is a cross section view of the complete breather. The upper portion of this breather 12 through 18 provides for elimination of crankcase vapors through ports 17 when ball 15 is raised from ball seat 14. As soon as pressure is released, ball 15 drops back to seating position, affecting a stop so that air is not drawn back into the crankcase during the vacuum part of the cycle. The lower oil separating portion of this valve 6 through 11 consists of a tubular body 6 with a baffle insert 8 which breaks the oil out of the vapors as vapors pass through port 9 and hits and passes around baffle 8. In this turbulence the oil is thrown free from the vapor and allowed to drop into reservoir 11 and then back into the crankcase through small port 10. The tubular body 6 is threaded on top 7 into body 5 which allows for this portion of the breather when installed in the crankcase to be turned away from the direction of the crankcase turbulence to further reduce oil intake into the breather.

FIG. 3 is a view of oil separator from the bottom, showing vapor flow and oil return ports.

I claim:

1. An auxiliary breather for an engine having an opening formed therein for providing an escape passage through which the vapors in the engine may be expelled, the breather comprising:

upstanding tube means secured to the engine with the lower

end thereof projecting into the engine through the opening and with the upper end thereof projecting above the engine a said tube means having both the top and bottom end thereof capped;

5 capped;  
an inlet port formed through the sidewall of said lower end;  
a cylindrical elongated baffle secured within said tube means on said capped bottom end and extending upwardly therefrom beyond said inlet port wherein the diameter of said baffle is less than the inside diameter of said tube thus providing a reservoir in said tube means around said baffle;  
an oil exhaust port formed through the capped bottom end of said tube means;  
15 valve means disposed in said tube means intermediate the ends thereof;  
at least one vapor exhaust port formed through the sidewall of said tube means above said valve means; and  
said baffle adapted to separate oil from vapors flowing from the engine into said tube means impinging thereagainst with the separated oil flowing back into the engine through said oil exhaust port and said valve means adapted to open in response to the flow of vapor through said tube means thus permitting the vapor to flow out of  
20 said tube means through said vapor exhaust port.

25 2. An auxiliary breather as defined in claim 1 wherein said tube means comprises a first pipe secured to said engine; a second pipe rotatably secured to the lower end of said first pipe and disposed in the engine, said second pipe having said inlet port formed in the sidewalls thereof and having said lower end sealed with said baffle mounted on said sealed end and said oil exhaust port formed therethrough; a nipple rotatably secured on one end thereof to said first pipe upper end; a third pipe rotatably secured at its lower end to said nipple other end, said third pipe having said valve means mounted therein and said vapor exhaust port formed therethrough; and a cap rotatably secured to the upper end of said third pipe.

30 3. An auxiliary breather as defined in claim 2 wherein said valve means includes an annular constriction disposed in said third pipe below said vapor exhaust port; a said constriction secured along its periphery to the inner walls of said third pipe; and a ball movably mounted in said third pipe above said constriction and adapted to rest on said constriction when a vacuum exists in the engine, thus preventing the flow of air back into the engine, and to rise off of said constriction in response to the flow of vapor from the engine.

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