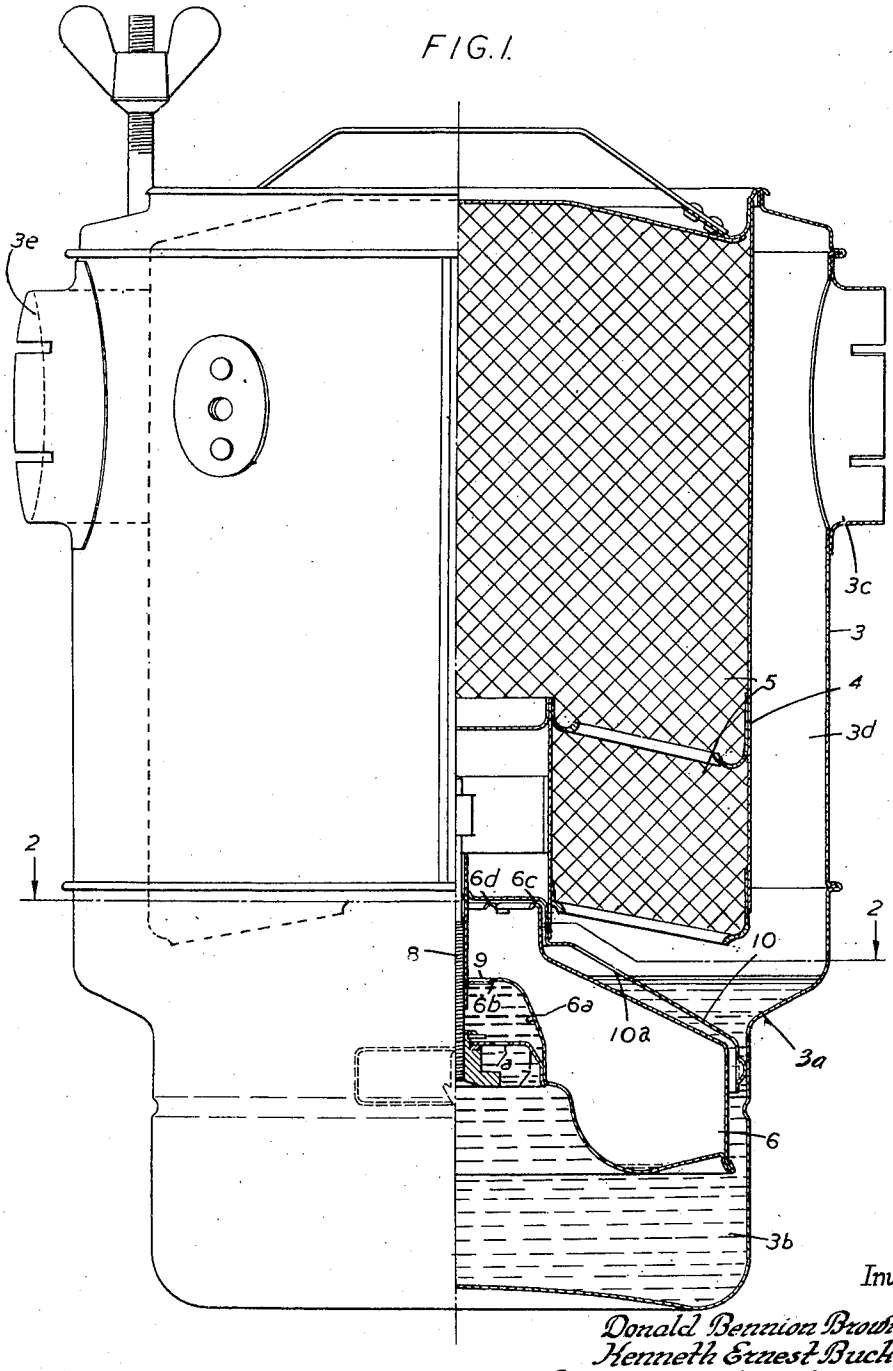
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AIR CLEANER

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FIG. 1.



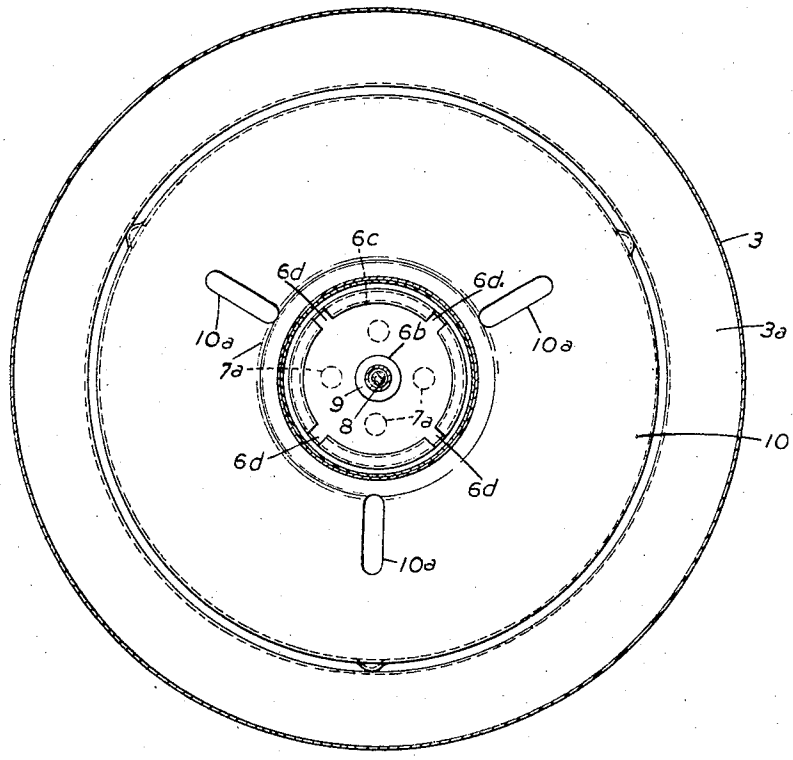
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FIG. 2.



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Patented Jan. 3, 1950 2,493,335

UNITED STATES PATENT OFFICE

2,493,335

AIR CLEANER

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Application March 16, 1944, Serial No. 526,663
In Great Britain March 17, 1943

2 Claims. (Cl. 183—15)

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This invention relates to air cleaners such as are used on internal combustion engines.

The invention is particularly concerned with air cleaners of the impingement-wetting type, that is to say those in which the air impinges on the surface of a liquid, usually oil, and thereby carries some of the oil into a mesh to wet the same.

In such cleaners the solid particles which are caught in the wet mesh are carried into the liquid container as the liquid drains down. They form a sludge in the sump of the container, which eventually raises the liquid level to an inoperative height. For this reason an overflow compensator is fitted, so as to maintain a constant liquid level.

According to the invention an air cleaner of the type hereinbefore referred to is characterised in that the compensator is located within the oil container and in that overflow from the container can pass into the compensator through a centrally disposed apertured means at the upper end of an upwardly directed reentrant chamber.

The invention will now be described with particular reference to the accompanying drawings wherein:

Figure 1 is a view partly in vertical section and partly in elevation of an air cleaner constructed in accordance with the invention; and

Figure 2 is a sectional plan view taken on the plane indicated by the line 2—2 in Fig. 1 looking in the direction of the arrows.

As illustrated in the drawing the improved air cleaner comprises an outer casing 3 and a concentric inner casing 4 which is filled with a filter body of superposed layers 5 of porous or fibrous material, the bottom of the said inner casing 4 being apertured to provide for circulation in the known manner. The vertical wall of the outer casing 3 is provided with an intermediate shoulder 3*a* and the lower portion of the said outer casing 3 constitutes the oil container 3*b*.

Disposed within the oil container 3*b* is an overflow or liquid lever compensator 6. This compensator 6 co-operates with an annulus 7 which is provided in a horizontal flanged portion thereof with apertures 7*a*. The lower section of the compensator 6 is also formed with an upwardly extending reentrant chamber 6*a* having in the upper end thereof a hole which is bounded by an arcuate anti-splash lip 6*b*, said hole being concentric with the main assembly spindle 8 so that an annular space 9 obtains between the periphery of the assembly spindle 8 and the lip 6*b*.

The upper portion of the compensator 6 is formed with an arcuate anti-splash rim 6*c* which

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abuts the underside of the bottom of the inner casing 4 and this rim 6*c* is formed at equidistantly spaced intervals with notches 6*d* as and for a purpose to be specified hereinafter. The upper portion of the compensator 6 is surrounded by an annular baffle 10 provided with spaced elongated slots 10*a*.

The container 3*b* is filled with oil to the level indicated so that the ledge constituted by the inner surface of the shoulder 3*a* is below the normal oil level.

Air passes into the cleaner by way of the inlet 3*c* and is directed downwardly through the annular space 3*d* on to the surface of the oil where it becomes wetted before passing upwardly through the filter material 5 and away through the outlet 3*e*.

Dust and dirt trapped by the filter material 5 and by the oil subsequently fall into the bottom of the container 3*b*.

As dust and dirt accumulate in the bottom of the container 3*b* oil overflows from the container 3*b* by way of the holes 7*a* in the annulus 7 and the annular space 9 between the lips 6*c* at the upper end of the reentrant chamber 6*a* and the spindle 8 into the compensator 6 whilst the air displaced from the compensator 6 due to the overflow described escapes by way of the notches 6*d* afore referred to, the annular space between the neck of the compensator 6 and the baffle 10 and the elongated slots 10*a* in the said baffle 10.

It will be seen that the arrangement provides for the maintenance of a constant liquid level and that owing to the communicating means between the container and the compensator being located adjacent to the centre of the cleaner, undue displacement of the oil due to tilting is avoided.

Further, since the main bulk of the compensator is below the level of the oil in the main liquid container the effect when the whole cleaner is tilted is to produce a lower effective oil level than would be the case where the compensator not fitted for it will be apparent that if no compensator were fitted, there would be in fact an additional volume of oil equal in bulk to the displacement of the compensator which would flow into the new tilted position thus resulting in a higher oil level than is the case with the compensator.

If desired, the invention may be applied to an air cleaner which incorporates a cleaner of the cyclone type as disclosed in the specification of British Letters Patent No. 550,292 in the name of The AC-Sphinx Sparking Plug Company Limited and others.

We claim:

1. In an air cleaner including a casing having a body of wetted porous or fibrous filter material above a liquid containing sump and an air inlet passage for flow of air under the filter body and over the liquid in the sump; a liquid level compensator centrally located in the sump and immersed in the liquid therein comprising an annular chamber having a centrally positioned reentrant lower and inner wall and an inwardly inclined outer and top wall, the portion of the reentrant lower and inner wall at the level at which liquid is to be maintained in the sump being near the axis of the chamber and being apertured at such level to provide for overflow at such level, and the inwardly inclined outer and top wall extending from below to above such level.

2. In an air cleaner including a casing having a body of wetted porous or fibrous filter material above a liquid containing sump and an air inlet passage for flow of air under the filter body and over the liquid in the sump; a liquid level compensator centrally located in the sump and immersed in the liquid therein comprising an annular chamber having a centrally apertured reentrant lower and inner wall and an inwardly inclined outer and top wall, the top portion of the reentrant lower and inner wall being apertured at the level at which liquid is to be maintained in the sump to provide for overflow at such level, and the inwardly inclined outer and top wall extending from below to above such level and being apertured above such level to vent air from within the compensator.

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KENNETH ERNEST BUCKMAN.

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