

July 5, 1927.

1,635,007

F. S. OREM

AIR CLEANER FOR AUTOMOBILES AND THE LIKE

Filed Feb. 6, 1926

Fig. 1.

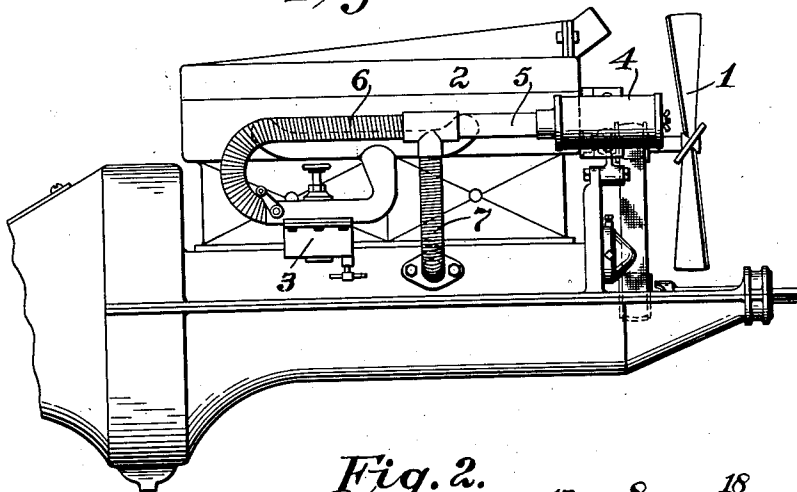


Fig. 2.

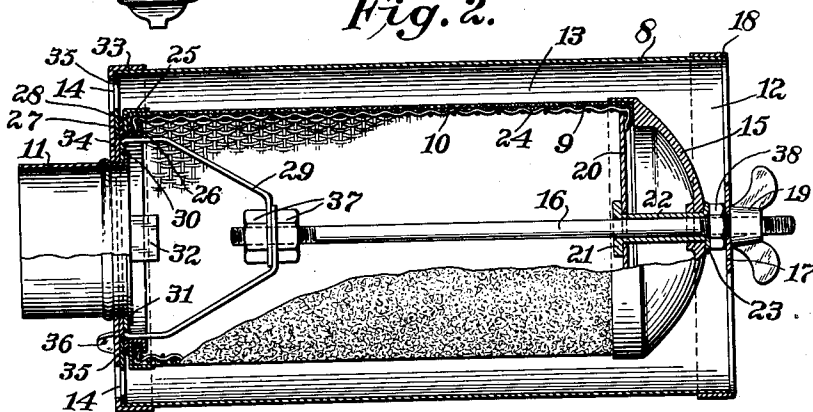


Fig. 3.

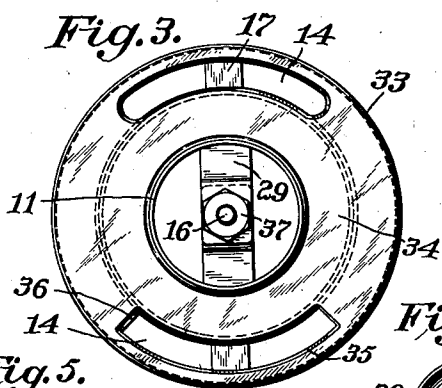


Fig. 4.

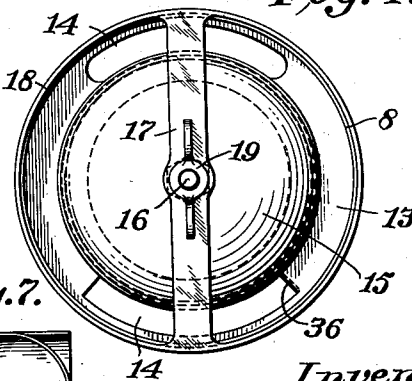


Fig. 5.

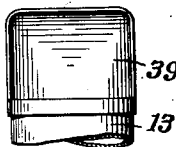


Fig. 6.

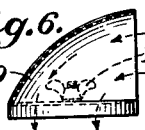
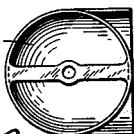


Fig. 7.



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Patented July 5, 1927.

1,635,007

UNITED STATES PATENT OFFICE.

FREDERICK STRATTNER OREM, OF BALTIMORE, MARYLAND.

AIR CLEANER FOR AUTOMOBILES AND THE LIKE.

Application filed February 6, 1926. Serial No. 86,532.

My invention is an air cleaner for removing dust from the air entering the carburetor and crank case of an automobile engine, and one object of the invention is to provide a filtering arrangement which will prevent filtering material from becoming clogged with dust, thereby eliminating the necessity of cleaning this material.

Other objects of the invention will be apparent from the following description.

The invention consists in the features and combination and arrangement of parts hereinafter described and particularly pointed out in the claims.

In the drawing forming a part of this specification

Figure 1 represents a side view of a conventional form of engine with my improvement combined therewith.

Fig. 2 is a longitudinal sectional view of the air cleaner device.

Fig. 3 is an end view looking from the left of Fig. 2, and

Fig. 4 is an end view looking from the right of Fig. 2.

Figs. 5, 6 and 7 represent details of a hood.

In these drawings 1 indicates a fan of ordinary construction in front of the engine, indicated generally at 2. 3 indicates generally the carburetor of any ordinary type. The air cleaner 4 is located in rear of the fan to receive the air currents therefrom, and from this air cleaner a pipe 5 extends with one branch 6 leading to the carburetor and the other branch 7 leading to the breather. The air cleaning appliance comprises an outer casing 8 and a central unit 9, the latter carrying the dust excluding material 10 and having a collar 11 extending coaxially therewith, to which the pipe 5 is joined. The front of the casing is open at 12 to receive the air from the fan which passes into the space 13 between the outer casing 8 and the dust excluding material 10, and some of this air is discharged from this annular space through the opening or openings 14 at the left hand end of the device, while the dust is caught by the dust excluding material 10 and is prevented from passing to the collar 11 and thence to the carburetor and breather. The clean air passes through the dust excluding material to the collar 11 and thence passes by way of the pipe 5 to the carburetor and the breather.

The central unit 9 is provided with an imperforate head 15 mounted on a rod 16 which is supported in an arm 17 extending across the front of the device and connected at its ends with a ring 18 which embraces the right hand end of the casing 8. This arm, together with the ring is held in place on the rod 16 by a wing nut 19 engaging the screw thread of the rod. The filtering material which is composed of felt is held between the head 15 and a plate 20, the said plate at its inner portion being held by a flange 21 of a sleeve 22 mounted on the rod 16 and having its end turned over at 23 upon the outer side of the head 15. The plate 20 clamps the filtering material between itself and the head 15 and also clamps the wire netting 24 in place so that this will afford a support for the filtering material.

At the left hand end of the unit 9 the wire netting and the filtering material are held between a ring 25 and an inner ring 26, which latter is of U-shape in cross section and has its outer portion 27 bearing upon the inturned flange 28 of the ring 25.

The lefthand end of the rod 16 is provided with a forked shape support 29, the arms of which are connected with the ring 30 in which ring the collar 11 is supported by its flanged end at 31. This ring 30 is provided with ears, one of which is shown at 32 for affording a bearing support for the U-shape ring 26.

The outer casing 8 at its lefthand end is supported in a ring 33 which forms a part of the plate 34. This plate is provided with openings at 14 and there is an adjustable member 35 adapted to be turned by a finger piece 36 for regulating the size of the openings at 14 so that the discharge of the current of air passing through the annular space 13 between the inner unit and the casing may be regulated to suit conditions.

The forked arm 29 is held to the rod 16 by nuts 37 and there is a nut at 38 for clamping the rod 16 and the head 15 and the sleeve 22 together.

In the operation of the device the air from the fan 1 with its load of dust or impurities passes into the annular space 13 and by reason of the suction of the engine, some of the air will pass through the filtering medium to the carburetor and breather through the centrally disposed collar 11. That portion of the air which does not pass through the

filtering medium will be discharged through the openings 14 at the left of the apparatus into the atmosphere.

The dust which lodges on the outer side of the filtering material will be blown away through the discharge openings 14 so that the device will be self clearing and only clean air will gain access to the carburetor and the breather, because this air must pass through the filtering medium to the interior or the central unit 9 from whence it will pass through the collar 11 to the pipe 5 leading to the carburetor and breather.

The outer casing can be detached from the inner unit 9 by removing the wing nut and the ring or head 18. This will leave the said inner member exposed for any desired purpose.

The inner unit would then comprise the head 15 held on rod 16 by nut 38, fork 29, ring 25, 26, ring 33, collar 11 and associated parts. If it is desired to detach the head 15 with the wire netting, felt and rings 25, 26 as one body, the nut 38 is removed in addition to the removal of the parts above referred to.

While I have shown the air cleaner in the position with its front head facing the radiator, I may place the cleaner in other locations.

The dusty air after passing through the radiator enters the cleaner at a velocity determined by the revolutions of the fan or speed of the vehicle.

The pistons of the motor produce a to and fro action of the air passing through the filtering material (an inspiration and expiration). By this action produced both in the intake of the carburetor and breather, dusty air adjacent the filtering material is kept in a state of agitation and this dust is carried off by the rush of air through the annular space 13 produced by the fan and the speed of the vehicle, thus preventing the filtering material from becoming clogged. This filtering material is kept taut and is supported by the comparatively wide mesh of the wire netting.

The air in passing through the cleaner into the inner unit through the filtering material changes its direction and is cleared of dust which is arrested by the filtering material so that only clean air reaches the carburetor and breather.

As shown in Figs. 5, 6, and 7, when the cleaner is arranged in vertical position, a hood 39 is used as the end head of the outer casing to deflect the air downwardly through the space 13. This hood will be held by the wing nut as shown.

The outer casing may be secured to any suitable part of the structure and may be removed leaving room to gain access to the interior unit, or the interior unit may be removed from the outer casing without removing the latter.

I claim:

1. An air cleaner for automobile engines comprising an outer imperforate casing open to the atmosphere at its opposite ends, an air filtering unit within said casing with a space between it and said casing and surrounding the filtering unit, said space providing a conduit for a current of air passed through the open ended casing, whereby said current of air will contact with the filtering unit longitudinally thereof to clear it of dust particles, said filtering unit having a head completely closing its front end and having an outlet from its rear end.

2. An air cleaner for automobile engines comprising an outer cylindrical casing open at its ends to the atmosphere for the passage of air longitudinally therethrough, the cylindrical surface of said casing being imperforate, an inner filtering unit arranged coaxially with said outer casing and spaced apart therefrom, said inner unit having a head at one end to act as a complete end closure for said unit, filtering material forming the cylindrical wall of said unit and through which the air passes from said annular space to the interior of said unit, an open work support for said filtering material and an outlet from the interior of the said filtering unit to supply clean air to the engine, said outlet being coaxially disposed in respect to the casing and said unit at the end opposite the headed end of said unit, substantially as described.

3. In combination, an outer casing having a head at one end with openings therethrough, a rod arranged centrally of the casing and having a nut to clamp the head in place, a cylindrical inner filtering unit comprising filtering material in cylindrical form, said unit having a head closing one end and connected with the rod, a ring at the other end of the rod, arms connecting said ring with the rod, a collar arranged coaxially of the filtering unit and connected with said ring, rings between which the filtering material is clamped, supported upon the ring first mentioned, a plate between which and the head the other end of the filtering material is clamped, and a sleeve connecting said plate with the head.

In testimony whereof I affix my signature.

FREDERICK STRATTNER OREM.