

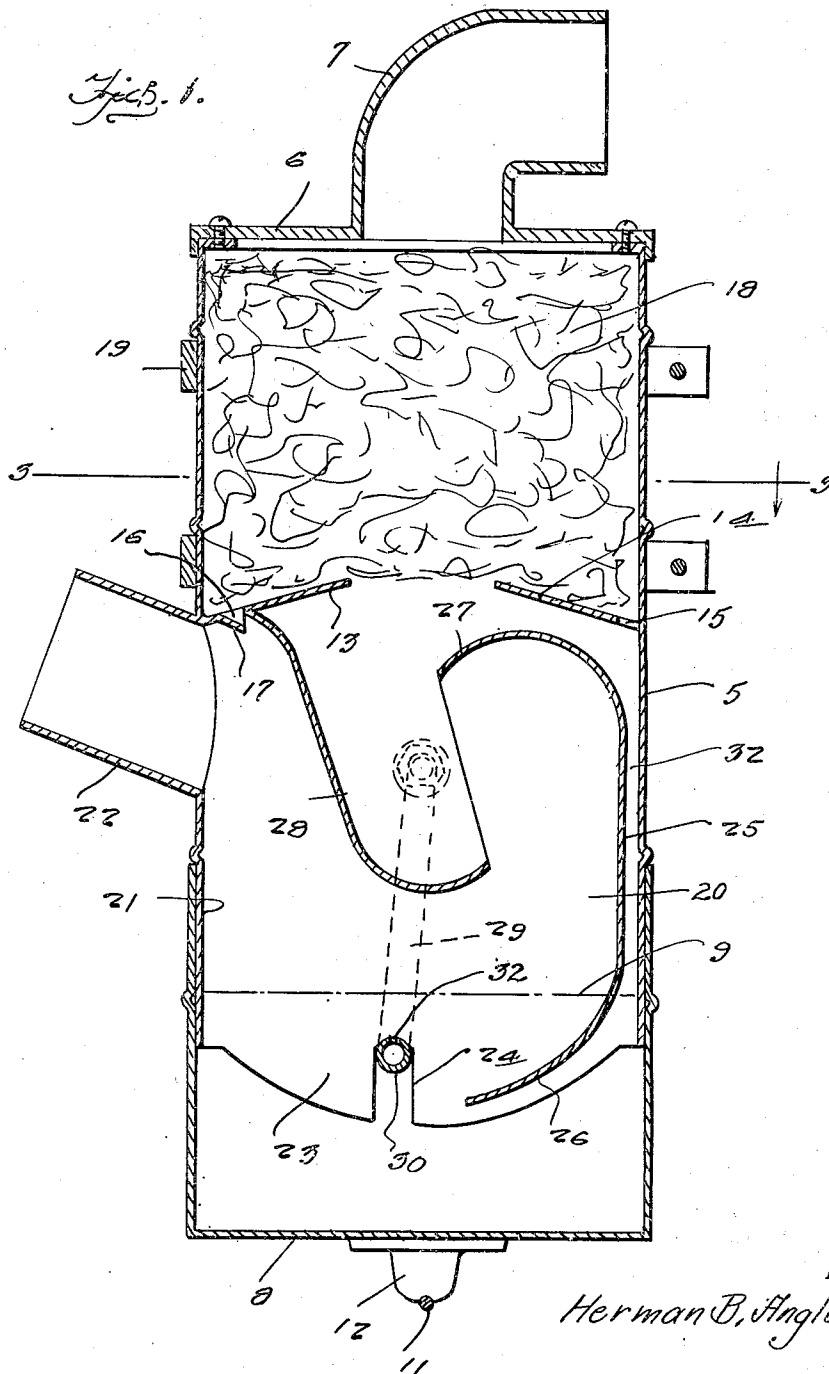
April 2, 1935.

H. B. ANGLEMEYER

1,996,604

AUTOMOTIVE AIR CLEANSING DEVICE

Original Filed May 2, 1929 2 Sheets-Sheet 1



Inventor

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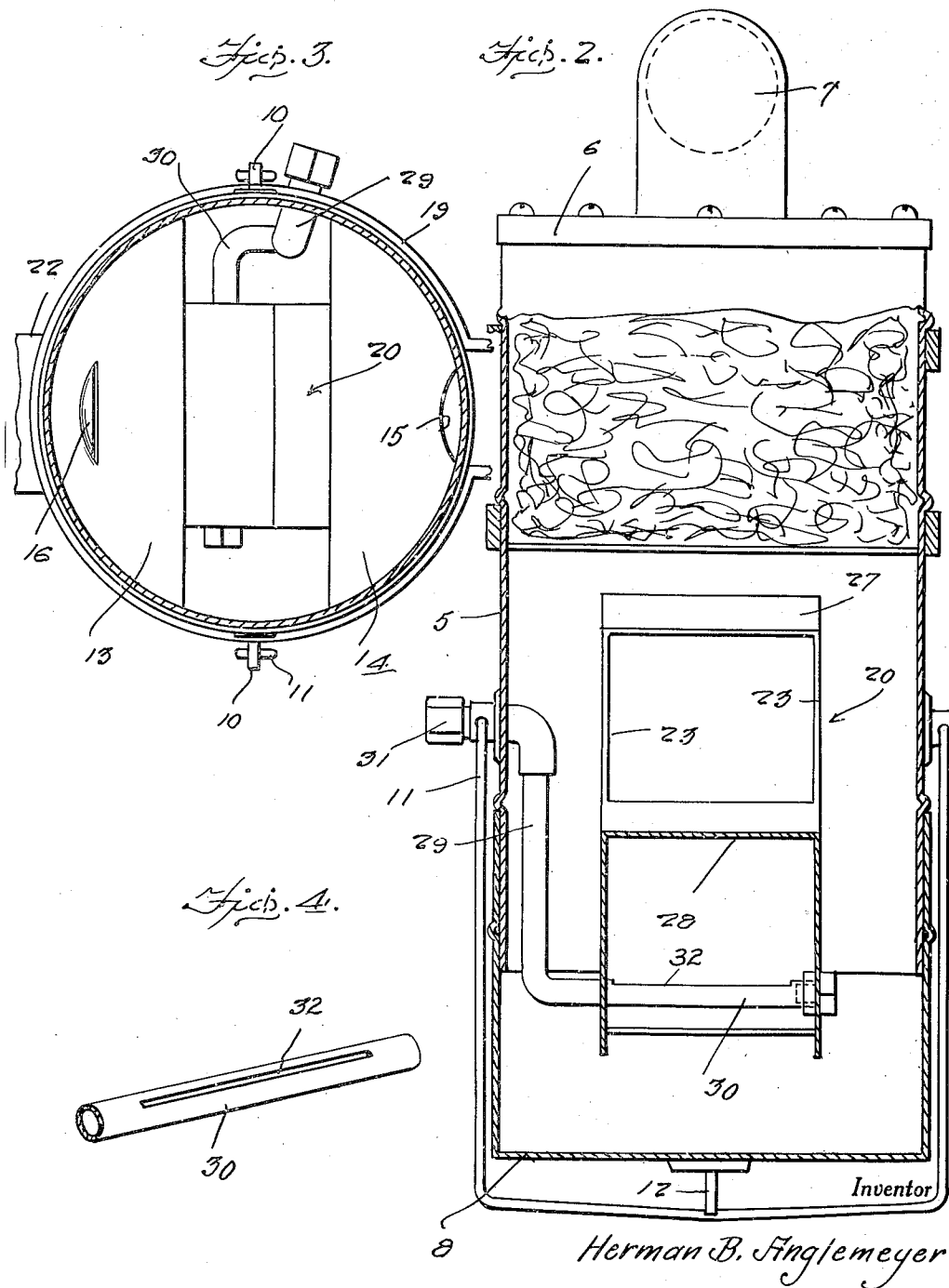
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UNITED STATES PATENT OFFICE

1,996,604

AUTOMOTIVE AIR CLEANSING DEVICE

Herman B. Anglemeyer, Chicago, Ill., assignor,
by direct and mesne assignments, of one-fourth
to B. Chaffey Shepard, one-eighth to M. W.
Zander, one-fourth to A. M. Lichty, one-
sixteenth to Ira H. Van Cleave, and one-tenth
to Joseph A. Allard, Jr., all of Pomona, Calif.,
and seventeen-eightieths to Handy Cleaner
Corporation, Detroit, Mich., a corporation of
Michigan

Application May 2, 1929, Serial No. 359,859
Renewed November 13, 1931

14 Claims. (Cl. 163—15)

This invention relates to an improved automo-
tive appliance which may be conveniently re-
ferred to in the art as an air cleansing device,
that is, an auxiliary structure which is adapted
to cleanse air which is supplied to the carburetor
to combine with the fuel charge to enhance the
operation of the motor, the appliance being also
susceptible of practical usage when associated
with air compressors.

The present invention has for its objects the
provision of a structure which in its functioning
will include any or all of the following features:
production of a screen of oil through which the
incoming air must pass and which screen acts
as an entraining means to capture solid particles
such as dirt; directing the air and any oil car-
ried by it through a passage such as to capture
oil and return it for further use, the oil being
used in a cycle; further cleaning the air of oil
and any dirt after leaving the passage; creation
of the oil screen by a motive gas enabling the
heating of such gas with consequent increase in
fluidity of the oil and addition of heat to the air
being cleaned.

The specific cooperation of the details of this
structure will become more readily apparent as
description proceeds.

In the drawings:

Figure 1 is a central vertical sectional view
through a cleansing device constructed in ac-
cordance with the present invention.

Figure 2 is a similar view, the section being at
right angles to that seen in Figure 1.

Figure 3 is a horizontal sectional view on the
line 3—3 of Figure 1.

Figure 4 is a perspective view of the horizontal
branch of the exhaust supply tube.

The embodiment of the device shown herein
comprises essentially a multiple part casing, one
part; namely the body is generally designated
by the reference character 5 and is in the form
of an open ended cylinder. There is an intumed
annular flange at the top with which a cover or
cap 6 is connected, and this cap is provided with
a clean air discharge elbow 7 with which a con-
ducting pipe (not shown) is adapted to be con-
nected. This pipe leads to the carburetor (not
shown). Telescopically fitted on the lower end
portion of the cylinder is an oil cup 8 which con-
tains a limited supply of oil, the normal level of
which is designated by the line 9 in Figure 1.

The reference character 10 designates dia-
metrically opposite lugs carrying a swingable re-
taining bail 11 whose bight portions cooperate
with a keeper bracket 12 on the bottom of the

cup as seen in Figure 2. This allows the cup
to be removed for providing a new supply of oil.

In the upper portion of this cylinder I provide
inclined baffles 13 and 14, respectively. The baf-
fle 14 is provided with a drain hole 15. Also the
baffle 13 is provided with a drain hole 16 and an
inclined return lip 17. These baffles define a
compartment in the upper portion of the cylinder
which is adapted to contain a porous absorbent
18. The function of this is to permit the oil
laden and heated air to permeate the absorbent
material before it passes out through the clean-
air discharge elbow 7. This also separates the
oil from the air and permits it to drain back into
the cup 8. The reference character 19 merely
designates a supporting band or flap which em-
braces the casing in the manner shown.

The screening and mixing chamber is general-
ly designated by the reference character 20 and
comprises a hollow box-like structure of the pe-
culiar configuration seen in Figures 1 and 2. It
comprises a front wall 21 with which the atmos-
pheric air inlet 22 is connected. Then there are
spaced parallel side walls 23 having notches 24
in their lower edges. There is a rear wall 25
having a curved lower end 26 and a similarly
curved upper end or crown portion 27. In ad-
dition there is a curvate web 28 and these parts
cooperate in producing a sinuous or tortuous
passage for the incoming air.

It is to be observed in Figure 2 that the screen-
ing chamber 20 is of general rectangular config-
uration and is centralized within the body por-
tion of the casing being bounded at the bottom
by the oil in cup 8. Thus, the top of the oil ex-
tends on opposite sides of the walls of the cham-
ber and this is of advantage in that the accumu-
lated dirt particles are allowed to be swept to the
side and to maintain that portion of the oil sur-
face at the center substantially clean. The cup
8 serves as a sump and settling chamber wherein
dirt may settle out of the returned oil.

I next call attention to the hot air supply de-
vice, this comprising a substantially L-shaped
tube having a vertical branch 29 and a horizon-
tal branch 30. The vertical branch is provided
with a coupling as at 31 to permit additional
piping to be connected therewith and to be ex-
tended to the exhaust manifold (not shown) to
receive a supply of hot gas therefrom.

The reference character 32 designates an elon-
gated discharge slot in branch 30 which is dis-
posed between the side walls of the screening
chamber and below the oil level as seen in Fig-
ure 1. This exhaust tube arrangement is im-

portant in that it permits the utilization of a pressure method employed in raising the oil for spraying purpose and forming the oil screen. The exhaust gases under pressure lift the oil and in this way I do not depend on the velocity of the incoming atmospheric air and suction from the motor to lift the oil. The hot gases exhausting through the oil spray not only lift the oil but heat it at the same time, keeping the oil at a temperature desirable for spraying purposes.

In operation, the atmospheric air enters through the air intake 22 where it flows into screening chamber 20. Here it passes through the oil spray or film of oil which is thrown up into the mixer, the oil being lifted by the exhaust gases and tube arrangement already described.

Thus the foreign matter is deposited in the oil. The air passes through the chamber and through the absorbent containing and cleansing chambers through the outlets and off through the carburetor. The oil returns to the lower chamber in the cup 8 through the openings 15 and 16 as well as by way of a vertical channel as seen in Figure 1. As before stated within the upper chamber is the filtering wad of material of appropriate texture. This is of a porous nature and allows the air to pass upwardly and thence on through, which removes the fine oil particles from the cleansed air. The oil is then returned through the passages already described.

The exhaust gases agitating the oil in the center of the oil screening chamber allows the foreign matter to settle at the outer edges of the bottom of the lower chamber which is a very desirable feature in this invention. The exhaust gases passing through the oil spray tube into the oil contained in the lower cup or chamber heats the oil and keeps it at a uniform temperature desirable for spraying purposes. It also warms the air and making the motor more economical on gasoline.

The peculiar configuration of the screening chamber with its tortuous passage as well as the centralized arrangement thereof in the casing is a point of merit to be emphasized. This in conjunction with the exhaust supply tube and the heating and bubbling arrangement as well as the oil return means enhances the operation of the device, making it modernized and susceptible of fulfilling the requirements of an invention of this class in a more satisfactory and practicable manner. The screening chamber also serves as a separating chamber due to the tortuous passage and walls. The heavier particles of oil and entrained dirt are projected due to their inertia to the outer sides of the turns and lodge against the walls running down thereover in a film to the sump cup 8 where the dirt settles. The oil is then projected by the gas blast through slot 32 to form a screen through which the incoming air passes. Some of the oil gravitates back over the end 26 of the wall 25. Some is carried up with the air and part lodges against the walls at the turns. Finally the remaining air and what oil is carried thereby passes into the filter medium 18 lodging therein and gravitating to the plates 13 and 15 and from there to the sump cup 8.

Having thus described the invention, what I claim as new and desire to secure by Letters Patent is:—

1. In an air cleansing device of the class described, a casing including an oil cup, an absorbent containing chamber above the oil cup and

a clean air outlet communicating with said chamber, an exhaust gas conducting tube having a portion immersed in the oil in said cup and an atmospheric air intake and oil screen chamber in said casing having its lower portion associated with said exhaust tube and bounded by the oil in said cup.

2. In an air cleansing device of the class described, a casing comprising a vertically elongated open ended cylinder constituting the body portion, a removable cap for the upper end of said cylinder including a clean air outlet, an oil containing cup telescopically fitted on the lower end of said cylinder, a pivoted retaining bail carried by said cylinder and having its bight portion cooperable with said cup for maintaining the cup in position, said cup being adapted to contain a predetermined quantity of oil, an oil heating and elevating tube carried by said cylinder and having its discharge end immersed in the oil in said cup, and an atmospheric air intake and oil screen chamber supported in said cylinder and having its lower end portion cooperable with said tube and bounded by the oil in said cup.

3. In an air cleansing device of the class described, a substantially cylindrical casing provided at its bottom with an oil containing cup and provided at its top with an absorbent chamber filled with absorbent material, and further provided at its top with a clean air outlet communicating with said chamber, a substantially rectangular hollow box-like air intake and oil screen chamber in the intermediate portion of said casing, the side walls thereof being spaced from the side walls of the casing, and an oil heating tube carried by said casing and communicating with said cup.

4. In an air cleansing device, a casing including an oil sump, a spray tube disposed in said sump in position so as to extend into the oil in said sump and adapted to be connected to a motive gas supply, an oil screen and air conducting chamber communicating with said sump adjacent said spray tube whereby an oil spray is created and maintained in said chamber by said spray tube, said spray tube being located at the inlet end of said chamber and means to collect the oil from the air passing from said chamber, said means communicating with said sump for the return by gravity of the oil collected to said sump.

5. In an air cleansing device, a casing including an oil sump, a spray tube disposed in said sump in position so as to extend into the oil in said sump and adapted to be connected to a motive gas supply, an oil screen and air conducting chamber communicating with said sump adjacent said spray tube whereby an oil spray is created and maintained in said chamber by said spray tube, said spray tube being located at the inlet end of said chamber, said chamber being tortuous whereby a stream of air is caused to make turns whereby entrained oil and solid particles are caused to be separated by the action of inertia and be deposited on the walls of said chamber.

6. In an air cleansing device, a casing including an oil sump, a spray tube disposed in said sump in position so as to extend into the oil in said sump and adapted to be connected to a motive gas supply, an oil screen and air conducting chamber communicating with said sump adjacent said spray tube whereby an oil spray is created and maintained in said chamber by said spray tube, said spray tube being located at the inlet

end of said chamber, said chamber being tortuous whereby a stream of air is caused to make turns whereby entrained oil and solid particles are caused to be separated by the action of inertia and be deposited on the walls of said chamber, and means to collect the oil from the air passing from said chamber and communicating with said sump for the return by gravity of the oil collected to said sump.

7. In an air cleansing device, an upright elongated casing including an oil sump at the bottom, a spray tube disposed in said sump in position to extend into the oil in said sump and adapted to be connected to a motive gas supply, walls extending upwardly from said sump defining a tortuous passage and providing an oil screen and separating chamber, said spray tube being located adjacent the inlet of said passage to project an oil screen spray across the stream of air entering said passage, said passage being in free communication with said sump whereby the stream of air is caused to make turns which causes entrained oil and solid particles to be separated from the air by inertia and to be deposited on said walls to return by gravity to said sump.

8. In an air cleansing device, an upright elongated casing including an oil sump at the bottom, a spray tube disposed in said sump in position to extend into the oil in said sump and adapted to be connected to a motive gas supply, walls extending upwardly from said sump defining a tortuous passage and providing an oil screen and separating chamber, said spray tube being located adjacent the inlet of said passage to project an oil screen spray across the stream of air entering said passage, said passage being in free communication with said sump whereby the stream of air is caused to make turns which causes entrained oil and solid particles to be separated from the air by inertia and to be deposited on said walls to gravitatively return to said sump, and a filter means to collect the oil from the air passing from said passage and communicating with said sump to return by gravity the oil collected thereby.

9. In an air cleansing device, an upright elongated casing including an oil sump at the bottom, a spray tube disposed in position extending into said sump and adapted to be connected to a motive gas supply, walls extending upwardly from said sump defining a tortuous passage and providing an oil screen and separating chamber, said spray tube being located adjacent the inlet of said passage to project an oil screen spray across the stream of air entering said passage, said passage being in free communication with said sump whereby the stream of air is caused to make turns which causes oil and solid particles to be separated from the air by inertia and to be deposited on said walls, said passage walls including a rear wall curving upwardly from the front at the lower end and with a return curve at the top and a front wall having at its bottom an offset continuing curve in relation to the top curved section of said rear wall whereby oil collected thereon will gravitate to said sump.

10. In an air cleansing device, an upright elongated casing including an oil sump at the bot-

tom, a spray tube disposed in position extending into said sump and adapted to be connected to a motive gas supply, walls extending upwardly from said sump defining a tortuous passage and providing an oil screen and separating chamber, said spray tube being located adjacent the inlet of said passage to project an oil screen spray across the stream of air entering said passage, said passage being in free communication with said sump whereby the stream of air is caused to make turns which causes oil and solid particles to be separated from the air by inertia and to be deposited on said walls, said passage walls including a rear wall curving upwardly from the front at the lower end and with a return curve at the top and a front wall having at its bottom an offset continuing curve in relation to the top curved section of said rear wall whereby oil collected thereon will gravitate to said sump, and an oil filter above said chamber including oil collecting baffles supporting a porous material, said baffles communicating with said sump to return oil thereto.

11. In an air cleaner, a casing having an air inlet and an air outlet, means in said casing arranged to form a curved path for incoming air, said casing being arranged to contain a liquid with the level thereof above the bottom of said path, and means disposed in said casing below the level of said liquid for releasing a motive gas under pressure into direct contact with said liquid to elevate said liquid in a spray across said air path.

12. In an air cleaning device, a casing having an air inlet and an air outlet, means in said casing forming a continuation of said inlet and defining a curved path for incoming air, said casing having an oil sump therein with the oil level above the lower part of said path whereby incoming air will strike said oil, and means in said casing extending transversely to said path arranged to discharge a motive gas directly into said oil throwing oil from said sump across said path.

13. In an air cleaning device, a casing having an air inlet and an outlet for cleaned air spaced from said inlet, partition means in said casing defining a path for incoming air, said means having an opening therein, said casing being arranged to contain a cleaning liquid with the level thereof above said opening, means for releasing a hot motive gas below said opening and below the level of said liquid, to throw said liquid across said path, and means in advance of said outlet for removing entrained liquid from outgoing air.

14. An air cleaner comprising a housing, provided in its upper portion with a cleansed air outlet and in the lower portion of its side wall with an air inlet, an open bottomed hollow member located within the lower portion of said housing and connected at one end to said air inlet, said hollow member being provided with an outlet, a perforated exhaust gas supply pipe extending into the lower portion of the housing and through the lower portion of the hollow member therein and a filtering body contained within the upper portion of said housing.

HERMAN B. ANGLEMEYER.

CERTIFICATE OF CORRECTION.

Patent No. 1,996,604.

April 2, 1935.

HERMAN B. ANGLEMEYER, ET AL.

It is hereby certified that error appears in the printed specification of the above numbered patent requiring correction as follows: Page 3, second column, line 42, claim 12, for "throwing" read throw; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 28th day of May, A. D. 1935.

Leslie Frazer**Acting Commissioner of Patents.**

(Seal)

CERTIFICATE OF CORRECTION.

Patent No. 1,996,604.

April 2, 1935.

HERMAN B. ANGLEMEYER.

It is hereby certified that Certificate of Correction issued May 28th was erroneously drawn as to the word "throw" and that this Certificate should read as follows: Page 3, second column, line 42, claim 12, for "throwing" read to throw; and that the said Certificate should be read with this correction therein that the same may conform to the records of the Patent Office.

Signed and sealed this 16th day of July, A. D. 1935.

Leslie Frazer
Acting Commissioner of Patents.

(Seal)