

P. WACHTEL.

ARRANGEMENT FOR PURIFYING AND RENDERING ODORLESS THE EXHAUST GASES OF INTERNAL COMBUSTION ENGINES AND THE LIKE.

APPLICATION FILED SEPT. 10, 1920.

1,415,418.

Patented May 9, 1922.

Fig. 1

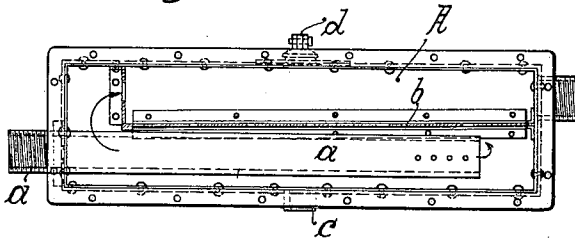


Fig. 2

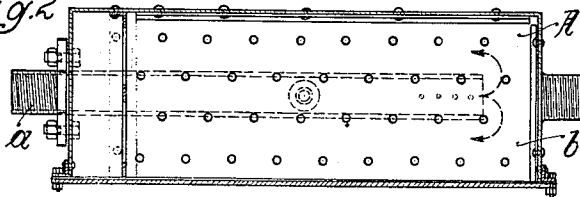


Fig. 3

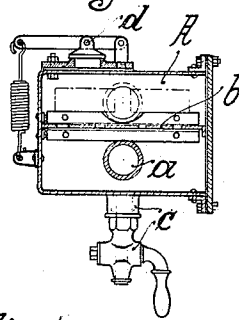


Fig. 4

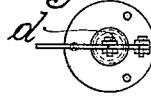


Fig. 7

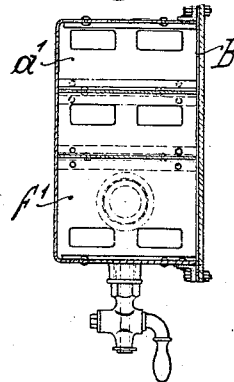


Fig. 5

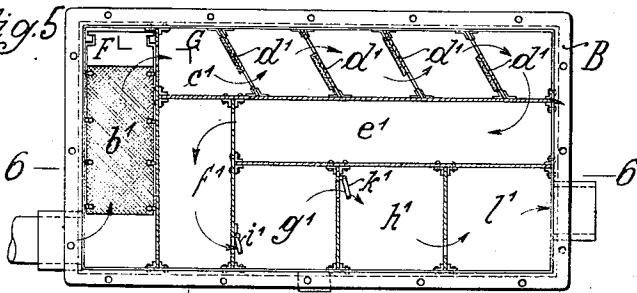
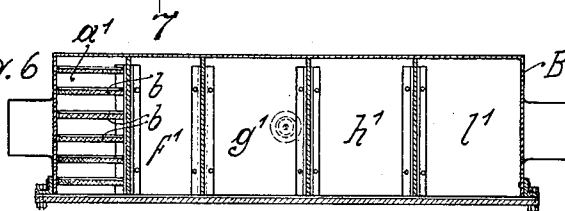


Fig. 6



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ARRANGEMENT FOR PURIFYING AND RENDERING ODORLESS THE EXHAUST GASES
OF INTERNAL-COMBUSTION ENGINES AND THE LIKE.

1,415,418.

Specification of Letters Patent.

Patented May 9, 1922.

Application filed September 10, 1920. Serial No. 409,493.

To all whom it may concern:

Be it known that I, PHILIPP WACHTEL, a citizen of the German Republic, and a resident of Frankfort-on-the-Main, Gutzkowstrasse 5, Germany, have invented certain new and useful Improvements in an Arrangement for Purifying and Rendering Odorless the Exhaust Gases of Internal-Combustion Engines and the like (for which I have filed application in Germany September 6, 1919), of which the following is a statement.

The present invention relates to an arrangement for absorbing, reliquefying, purifying and rendering odorless the waste gases of fuels and also the escaping residues of the burnt oil of internal combustion engines, in particular in automobiles.

The invention resides in the novel features and arrangement of parts as more fully hereinafter described and claimed.

None of the arrangements heretofore disclosed has given a practical solution of the problem, and it has not been possible to secure the desired effect, namely to free the public, in large cities, from the annoyance of the air in the streets being saturated with the unhealthy gases escaping from motor cars, and from the nasty smell of the burnt lubricating oil.

Liquids which are employed for purifying the hot, unburnt gases, escaping under a high pressure, will be partly carried away by the gases. The use of solid materials such as pumice stone, coke or the like as means for purifying and filtering the exhaust gases has shown that these materials will, in a short time be coated with a thick film of grease from the oil and the residues carried along in the gases, so that also these materials will remain without the desired effect.

This failure of almost all arrangements heretofore disclosed may be attributed to the fact that individual arrangements, such as those disclosed, do not have any influence on the force and the large volume of the exhaust gases, as a full success can only be secured by a combined arrangement, and this only if the several individual arrangements are employed in a certain succession. Above all it is necessary to separate the greater mass of deposited exhaust gases and burnt oil and to render the same liquid again by heating it. After this slagged mass has

been separated in a special container, the filtering, condensing and final purifying may proceed. The remaining, purified exhaust, resembling a white cloud, will then, by chemical means, be allowed to escape absolutely odorless, into the air.

An arrangement of the kind described is hereinafter described, reference being had to the accompanying drawing. This arrangement consists of two apparatus, one of which should be disposed as close as possible to the motor. In this first apparatus the exhaust gases of gasolene and benzole and the smoke of the burnt oil are absorbed and separated in form of an evil smelling viscid black mass.

In the accompanying drawing—
Figure 1 is a vertical longitudinal section through Fig. 2.

Fig. 2 is a horizontal section,

Fig. 3 is a transverse section,

Fig. 4 is a top view of the safety valve.

Figure 5 is a vertical longitudinal section through the main purifier.

Fig. 6 is a longitudinal section on the line 6—6 of Fig. 5.

Fig. 7 is a cross section on the line 7—7 of Fig. 5.

After the explosion in the motor cylinders the exhaust gases are conducted through the tube *a*, which is perforated at its end and is filled with small pieces of coke, into the converter or preliminary purifier A. In the upper part of the latter is provided a chamber; the bottom of which is formed by a perforated plate *b*, on which small pieces of coke are strewn.

On leaving the tube *a* the exhaust gases first pass through a hollow space and then into the aforementioned chamber; and discharge their components in a liquid state. This discharge is then absorbed by the porous coke.

The liquids from the fuel and the oil, which are here discharged, will, in consequence of their gravity, pass downwards and through the perforated plate *b*; and thus reach the bottom of the preliminary purifier A, where they may be let off through a tap *c*. On the purifier is provided a safety valve *d*, the object of which is to safeguard the apparatus against explosions of the mixture from misfires of the motor. The spring of this safety valve is gauged to correspond to the ordinary pressure of the exhaust. It will

open immediately in case of violent explosions and will allow of the explosion pressure passing freely out without affecting the apparatus. The valve spring may be unhung and the valve be lifted out in case the necessary cleaning should have been omitted, or a tube or chamber should have become choked, so that the exhaust may be allowed to escape directly into the atmosphere.

After the exhaust gases have been freed of oil and the evil components the remaining residues of the gasoline or benzole pass from the purifier A to the main purifier B. The preliminary purifier A communicates with the main purifier B by means of a tube of any suitable length, which should be dimensioned according to the size of the car or the frame.

At the entrance into the main purifier is provided a chamber a^1 , through which the fuel residues pass from below upwards. In this chamber are suspended exchangeable plates of sheet metal b^1 to which plates of felt or cloth are attached. The fuel residues passing along these from below up will there deposit any still contained sticky matter. From this chamber the purified exhaust gases are conducted into a chamber c^1 , in which again sheet metal plates are disposed, but this time in an oblique position, and to these plates are secured exchangeable felt plates, preferably in a staggered position so as to facilitate the depositing of any matter still contained in the gases. Beneath the chamber c^1 are disposed chambers e^1 and f^1 , which are filled

with porous material, which can no more be choked by oily matter as all such has been previously separated. The following chambers g^1 and h^1 are filled with sponges or woolen stuff. These chambers are fitted with sheet metal valves i^1 and k^1 , which, coated with felt, are readily movable and will have a slight throttling effect, without, however, reacting on the motor. The area of the passages is, therefore, made by two thirds larger than those at the motor housing. The last chamber l^1 is intended as a scenting chamber and contains a sponge, saturated with some nice smelling fluid.

I claim:

An apparatus for purifying and rendering odorless the exhaust gases of internal combustion engines and the like consisting of a series of chambers, baffling plates in the first of said chambers adapted to conduct the exhaust gases passing through along a horizontal zigzag path to collect any still contained oily matter, porous material in the second chamber, the following filled with absorbent material as sponges and again conducting the gases along a zigzag path, and adapted to completely remove the objectional smell of the exhaust gases.

In testimony whereof I affix my signature in the presence of two subscribing witnesses.

PHILIPP WACHTEL.

Witnesses:

WILHELM GOLDFIECH,
GOTTFRIED MARDIN.