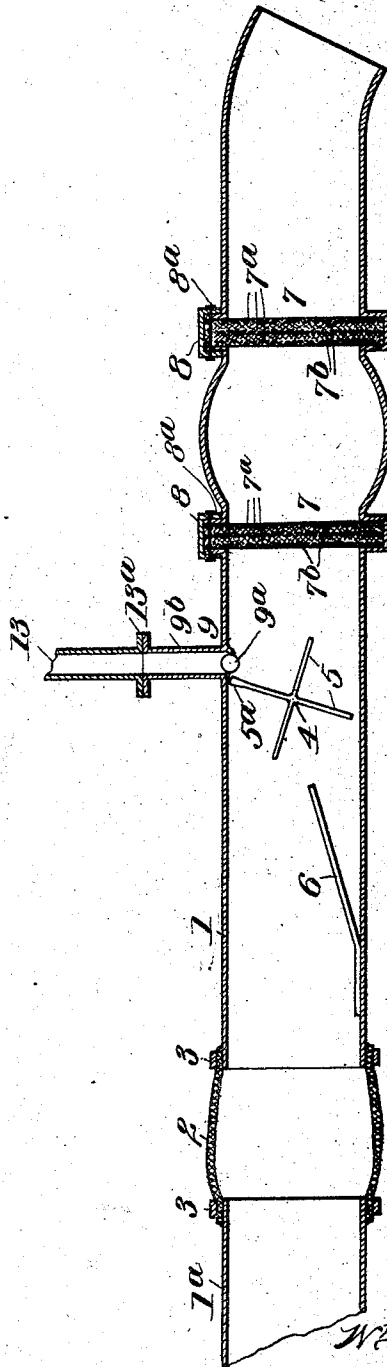
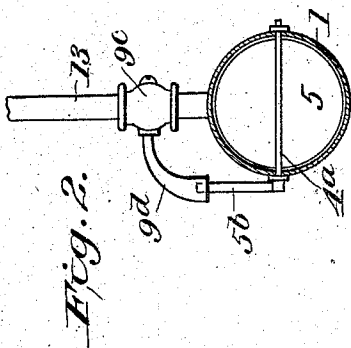
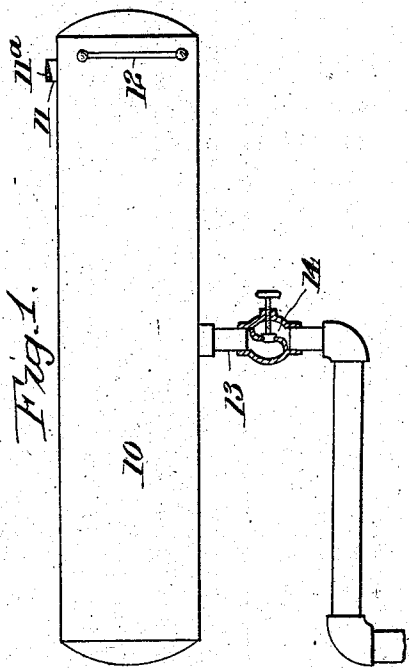


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 APPARATUS FOR PURIFYING EXHAUST ENGINE GASES.
 APPLICATION FILED OCT. 5, 1915.

1,179,145.

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APPARATUS FOR PURIFYING EXHAUST ENGINE-GASES.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, WILLIAM SOUTHERN, a subject of the King of Great Britain, residing at Nanaimo, in the county of Nanaimo and Province of British Columbia, Canada, have invented certain new and useful Improvements in Apparatus for Purifying Exhaust Engine-Gases, of which the following is a specification.

This invention relates to a device or apparatus for cleaning and deodorizing the exhaust gases of an internal combustion engine.

The object of my invention is to provide a simple and effective apparatus for cleaning or purifying exhaust gases of an internal combustion engine by spraying or injecting into them as they pass through the exhaust pipe a cleaning and deodorizing liquid and then passing the gases and liquid or vapors through strainers composed of wire gauze and some light fabric, which may be made of asbestos, woven like cheese cloth, in the exhaust pipe.

Another object of my invention is to provide for operating a butterfly-wheel or fan by means of a stream of exhaust gas for opening a valve to supply a cleaning liquid to the exhaust pipe.

The exhaust gases of a gasoline engine are often quite offensive in odor and injurious to health, especially after the engine has been stopped and then started, as frequently happens with an automobile. My apparatus is quite effective for purifying and deodorizing such exhaust gases and is operated automatically by the flow or current of exhaust gas.

The matter constituting my invention will be defined in the claims.

I will now describe the details of construction of my purifying apparatus by reference to the accompanying drawings, in which—

Figure 1 represents a longitudinal section of an engine exhaust pipe containing the devices of my invention and a connected supply tank in elevation, the arrangements of parts being somewhat diagrammatic for the purpose of illustration. Fig. 2 represents a transverse section of the exhaust pipe and a modified construction and arrangement of a valve in the feed pipe.

The body 1 of the cleanser may be composed of pipe one or two sizes larger than

the usual exhaust pipe 1^a leading from the engine. This body 1 will be located in any convenient part of an automobile or motorcycle, or convenient to any gas or gasoline engine.

The exhaust pipe 1^a is preferably coupled to the body 1 by a rubber hose 2, or other flexible pipe, by means of clamps or coupling devices 3, which may be of any well known character, such as a screw-threaded collar fitting on a screw-threaded end of the body or exhaust pipe. At about the middle part of body 1 there is mounted by its axle a butterfly-wheel or fan 4 which may have four or more blades 5. One of these blades is made longer than the others and provided with a thickened and weighted part 5^a at its outer end, the wheel being so placed that the part 5^a will impinge upon the periphery of the ball valve 9^a, resting upon a brass seat 9 in the top of the body 1. The thickened edge 5^a may be composed of some hard composition, like an alloy of comparatively soft metal or hard rubber, which will not injure the brass ball 9^a.

At the bottom of the body 1, and near this inlet end, is secured an inclined plate 6 extending inward toward the wheel 4 for causing the current of exhaust gas to be shot upward toward the top of the butterfly wheel, so that the wheel shall always be turned from left to right. In the body, beyond the wheel, are also secured transverse strainers and purifiers 7, 7; these are preferably constructed of brass wire gauze plates 7^a and sheets of asbestos made like cheese cloth 7^b. I do not wish to be confined to any particular details of construction of these strainers, as any good strainer composed of a sheet of mineral wool between plates of perforated metal or wire cloth may be used. These sheets of wire cloth and fabric are secured in lids or covers 8 by means of screws or split pins 8^a, or other desired means, and the lids make tight joints with the body 1.

An elevated tank 10, for containing a purifying and deodorizing liquid, may be made of galvanized iron, copper, or other sheet metal, and placed in a convenient position under the back seat of an automobile. This tank is provided with a filling opening and cap 11, the cap having a vent opening or air inlet 11^a. A gage glass 12 is preferably applied to the tank. A liquid

feed-pipe 13 connects with the underside of the tank and by means of a union 13^a with a short section of pipe 9^b, which terminates in the seat 9 in the top of body 1. This feed-pipe is provided near the tank, or any other convenient part of it, with a needle valve 14 of well known construction, for regulating the amount of liquid supplied to the body 1 or to the pipe section 9^b. By means of valve 14 the flow of liquid may be shut off in case of repairs to any of the parts in the body 1.

Instead of a ball valve 9^a, I may use a spring valve 9^c in pipe 13, and provide the stem with a curved handle 9^d, as shown in Fig. 2. The axle 4^a of the butter-fly wheel 4 will be extended through the wall of the body casing 1 and provided with a wiping arm 5^b of the proper length to strike or impinge upon the lower end of the handle 9^d of the spring valve and slightly open the same to permit the flow of a small amount of purifying liquid into the current of foul gas.

The blades of the revolving butter-fly wheels will strike and spray the liquid as it falls into the body and the current of gas will carry the spray into the strainers and keep them wet with the purifying and deodorizing liquid. The strainers, thus kept wet, with liquid, will purify and deodorize the gas as it is passed through them. It will be noted that the valve will be opened at every revolution of the butter-fly wheel and will be immediately closed until again opened by the long blade 5^a or the arm 5^b.

When the engine has been standing idle for sometime, the feed-pipe will become filled with liquid down to the valve, and therefore, when the engine starts more liquid will be supplied. This will be advantageous because at that time the exhaust fumes, or gases, are apt to be at their worst, and consequently require more thorough purification.

My apparatus can be easily and quickly installed and takes up very little room in a vehicle. The construction being simple there is nothing to get out of order but what can be repaired at little expense. The needle valve being once set to regulate the flow of liquid the operation is practically automatic.

The purifying liquid is of such a character that it will deodorize the gases but will not eat or corrode the parts of the apparatus.

The weighted blade 5^a will naturally fall to the bottom of the body casing 1 when the engine is at rest, permitting the ball valve to be closed, so that no liquid can escape until the engine is again running.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with an internal combustion engine, of an exhaust purifier, com-

prising a body or pipe section having a transverse perforated strainer, a pipe having a valve for supplying a purifying liquid and means in the body in the path of the current of exhaust gas for opening the valve and spraying liquid upon the strainer.

2. The combination with an internal combustion engine, of an exhaust purifier, comprising a body or pipe section, having a transverse porous strainer, a supply pipe for purifying liquid opening into the body in front of the strainer, and having a valve, and means in the body in the path of the current of exhaust gas for opening the valve, whereby such means may be moved by the current and the valve intermittently opened to supply liquid to the current of gas before passing through the strainer.

3. The combination with an internal combustion engine, of an exhaust purifier, comprising a body casing, having a transverse strainer, a supply pipe for purifying liquid opening into the body in front of the strainer, and having a valve, a butterfly-wheel or fan mounted in the body casing near said valve, and having an extended arm or blade adapted to open the valve when said wheel is turned by the current of exhaust gas, for supplying purifying liquid to said current of gas before passing through the strainer.

4. The combination with an internal combustion engine, of an exhaust purifier, comprising a body casing, having a transverse strainer, a liquid supply pipe having a valve at its opening into the said body, a butterfly-wheel, having one blade extended and weighted at its outer end and adapted to open said valve, and means in the casing for directing the current of gas against the upper part of said wheel for turning the same.

5. The combination with an internal combustion engine, of an exhaust purifier, comprising a body casing, having a transverse strainer, a liquid supply pipe having a valve, a butterfly-wheel having an arm or blade adapted to open the valve, and an upwardly inclined plate for directing the current of gas against the upper part of said wheel to turn the same.

6. In an exhaust purifier casing, a strainer arranged in the path of the gas current, a liquid supply pipe having an opening and valve seat in the top of the casing, a ball valve resting on the seat and a butterfly-wheel having an arm or blade adapted to impinge on the ball for raising the same when the wheel is turned by the current of exhaust gas, all in combination, substantially as described.

7. The combination with an internal combustion engine and a casing for exhaust gas, of an elevated tank for purifying liquid, a pipe connecting the same with the casing

and having a valve at its opening in the casing, a butterfly-wheel mounted in the casing and having an extended blade adapted to open the valve, and means in the casing
5 for directing a current of gas against the upper part of said wheel for turning the same, substantially as described.

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

WILLIAM SOUTHERN.

Witnesses:

JOHN ROBERT GILLS,
H. NIXON.