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APPARATUS FOR OVERCOMING THE DISCOMFORT PRODUCED BY AUTOMOTIVE EXHAUST

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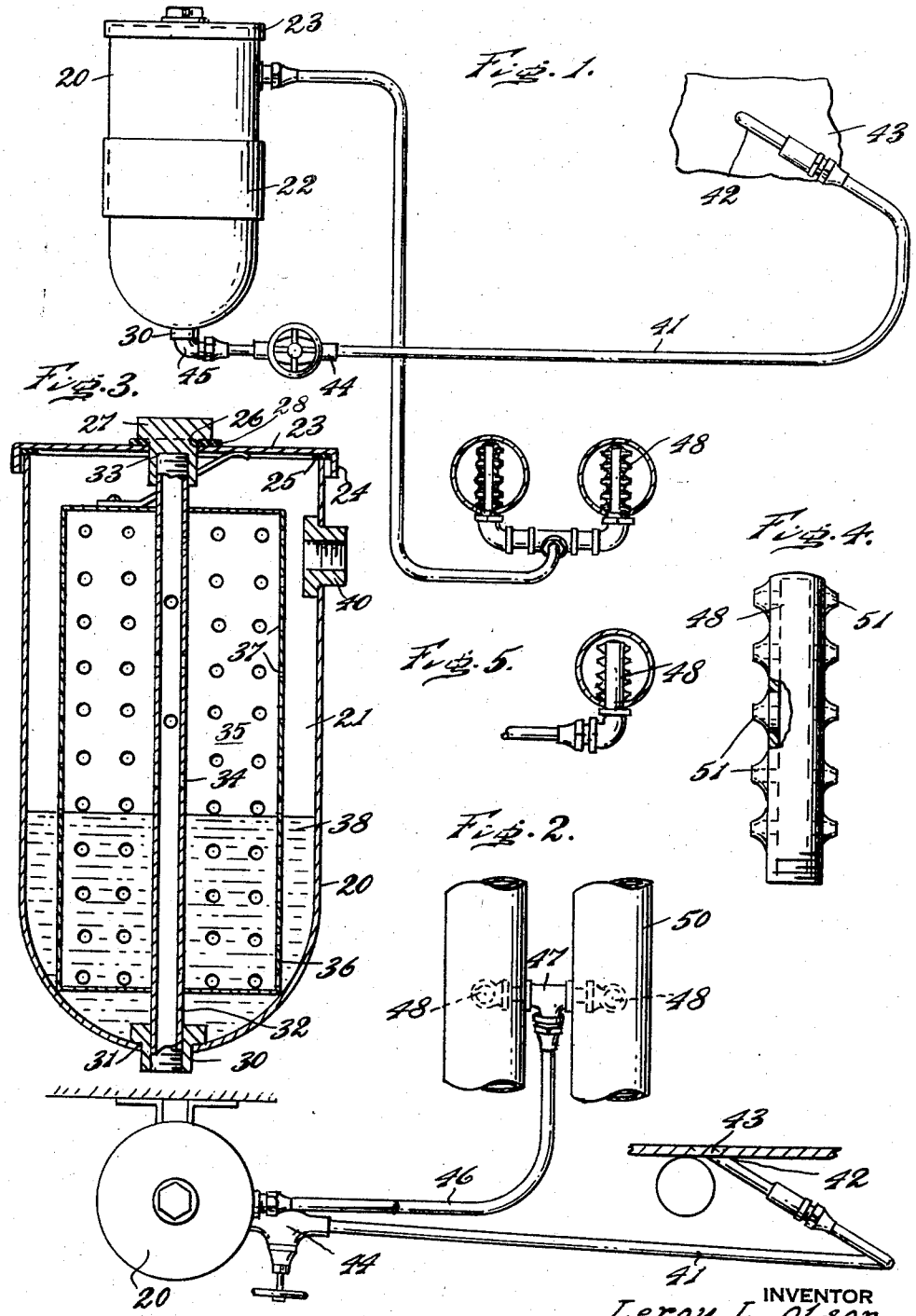

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APPARATUS FOR OVERCOMING THE DISCOMFORT PRODUCED BY AUTOMOTIVE EXHAUST

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Original application April 23, 1957, Serial No. 654,481. Divided and this application February 4, 1958, Serial No. 713,255

3 Claims. (Cl. 21—108)

The present invention relates to a mechanism for removing the objectionable effects of automotive exhaust, particularly diesel exhaust and especially on busses.

The present application is a division of my copending application Serial No. 654,481, filed April 23, 1957, for Method and Apparatus for Overcoming the Discomfort Produced by Automotive Exhaust.

A purpose of the invention is to introduce into the exhaust after it leaves the muffler and before it is discharged into the atmosphere, an odorizing agent and a stream of air, the odorizing agent being airborne or vaporized before it enters the exhaust.

A further purpose is to pipe a stream of air from the engine air chamber through a vaporizer carrying an odorizing agent and then desirably to inject the air carrying the odorizing agent into the exhaust beyond the muffler.

Further purposes appear in the specification and in the claims.

In the drawings I have chosen to illustrate a few only of the numerous embodiments in which the invention may appear, selecting the forms shown from the standpoints of convenience in illustration, satisfactory operation and clear demonstration of the principles involved.

Figure 1 is a diagrammatic vertical elevation, partly in section, showing the device of the invention.

Figure 2 is a diagrammatic plan view of the device of Figure 1.

Figure 3 is a central vertical section, partly diagrammatic, showing the vaporizer.

Figure 4 is an enlarged front elevation of the discharge diffuser of the invention.

Figure 5 is a transverse section showing a discharge diffuser located in the exhaust pipe of an engine having a single exhaust pipe.

Describing in illustration but not in limitation and referring to the drawings:

Considerable difficulty has been encountered in the art through the discomfort caused to personnel by exhaust fumes of automotive engines which are often acrid, lacrimatory and highly unpleasant.

This is particularly true in the case of personnel riding toward the rear of passenger busses. Discomfort is also caused to pedestrians. The present invention is designed to overcome this difficulty by two features used in combination.

(1) An odorant agent which masks the effect of the exhaust is vaporized or rendered airborne.

(2) A stream of air containing this odorant agent is introduced into the exhaust after it has passed through and been cooled by the muffler, but before it is discharged into the atmosphere.

Any one of a wide variety of odorant agents may be used, suitable examples being vanilla extract, oil of wintergreen, oil of rose, oil of eucalyptus, oil of pine, as well as a wide variety of synthetic odorants.

I prefer to use a liquid odorant agent, or in any case one of high vapor pressure which will readily vaporize.

In accordance with the invention I employ a vaporizer 20, suitably a tank forming an internal chamber 21, and which is suitably supported from a bracket 22 in any convenient place, for example under the hood of the motor vehicle or in the engine compartment. The chamber is suitably closed by a cover 23 flanged at 24, gasketed at 25, and having a central opening 26 which passes a cap 27 gasketed to the cover at 28.

An opening in the bottom of the chamber receives a central inlet fitting 30 in line with the cap, which is united as by welding at 31 to the side wall, and into which is threaded an inlet pipe 32 which by threading into the cap at 33 exerts closure pressure on the cover.

The inlet pipe has a series of radial orifices 34 distributed along its length which discharge into a vaporizer element 35 surrounding the inlet pipe within the chamber and held by a cage or housing 36, which is suitably perforated at the exterior to provide discharge openings 37. In the case of a liquid agent, the vaporizer element 35 is suitably a fibrous mass, such as cotton waste, slag wool, rock wool, metallic wool, or the like, which will, by wick action distribute over a large surface an odorant agent 38 in liquid form at the bottom of the chamber.

Where, however, the odorant agent is a solid, in the form of crystals or granules, the odorant element may itself consist of the odorant agent.

The chamber wall suitably near the top at the outside has a discharge fitting 40 welded or otherwise secured therein.

A pipe 41 connected at 42 to the wall of the engine air chamber 43 or other suitable source of air under slight pressure passes through a normally open valve 44 and enters by a fitting 45 into the bottom of the inlet pipe 32.

A pipe 46 connects from the discharge fitting 40 of the vaporizer to a T 47 which discharges into discharge diffusers 48, each of which is located in one of the twin exhaust pipes 50 of the engine between the mufflers and the point of discharge into the outside atmosphere. It will of course be understood that only one diffuser may be used where there is only a single exhaust pipe, as in Figure 5. Each of the diffusers suitably has a series of discharge orifices 51 which discharge desirably at right angles to the direction of the exhaust stream.

In operation it will be understood that air from the engine air chamber or other source of air enters the inlet pipe of the vaporizer and passes through the vaporizer element and there picks up odorant from the caporizer element. The mixture of air and airborne odorant then passes into the discharge diffuser and is there discharged into the exhaust stream where it dilutes the exhaust, tends to oxidize unsaturated compounds and provides a masking odorant.

It will be evident that the vaporizer need not withstand a high temperature since the exhaust does not actually pass through the vaporizer, but only the air stream leading to the exhaust.

It will also be evident that venturi effect of the discharge diffusion tends to add to the pressure contributed by the engine air chamber so as to obtain effective injection and thorough mixing. It is preferred to use a pressure of the order of 4 to 6 p.s.i.g.

In view of my invention and disclosure variations and modifications to meet individual whim or particular need will doubtless become evident to others skilled in the art to obtain all or part of the benefits of my invention without copying the apparatus shown, and I, therefore, claim all such insofar as they fall within the reasonable spirit and scope of my claims.

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

1. In mechanism for overcoming the noxious character

of automotive exhaust, for use in an automotive vehicle engine including a muffler: a vaporizer having a vaporizing element, walls forming a chamber surrounding the vaporizer element, walls forming an inlet passage to the vaporizing element having orifices distributed at intervals along the vaporizing element, there being an odorant agent in the chamber and distributed over the vaporizing element, an air tube connecting a source of air under pressure to the inlet passage, a discharge diffuser in the exhaust pipe beyond the muffler, and a pipe connecting the chamber to the discharge diffuser and carrying air and odorant agent from the vaporizer element to the discharge diffuser, whereby a stream of air and odorant agent is introduced into the exhaust.

2. In mechanism for removing the objectionable character of exhaust from a Diesel engine having an engine air chamber, a muffler and an exhaust pipe beyond the muffler: walls forming a vaporizer chamber, an odorant agent in the vaporizer chamber, an inlet pipe extending longitudinally of the vaporizer chamber and having a series of radial orifices, a vaporizer housing in the chamber surrounding the inlet pipe, a fibrous vaporizer element occupying the space inside the vaporizer housing around the inlet pipe, the vaporizer element exerting wick action on the odorant agent, there being discharge orifices around the outside of the housing, a pipe connecting the engine air chamber with the inlet pipe of the vaporizer, a pipe connecting the chamber around the vaporizer housing with the exhaust pipe beyond the muffler, and a diffuser head connected to the end of the latter pipe in the exhaust pipe and having a series of discharge orifices which discharge air laden with odorant agent into the exhaust.

3. In a device for removing the objectionable character of the exhaust of an internal combustion engine having an air chamber, a muffler and an exhaust pipe beyond the muffler: a vaporizer housing having discharge orifices, an odorant agent in the vaporizer housing, an inlet pipe at the interior of the vaporizer housing connected at one end to the air chamber of the engine, a discharge diffuser having orifice means located in the exhaust pipe beyond the muffler, walls forming a chamber surrounding the vaporizer housing and a pipe connection from the chamber to the discharge diffuser.

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