

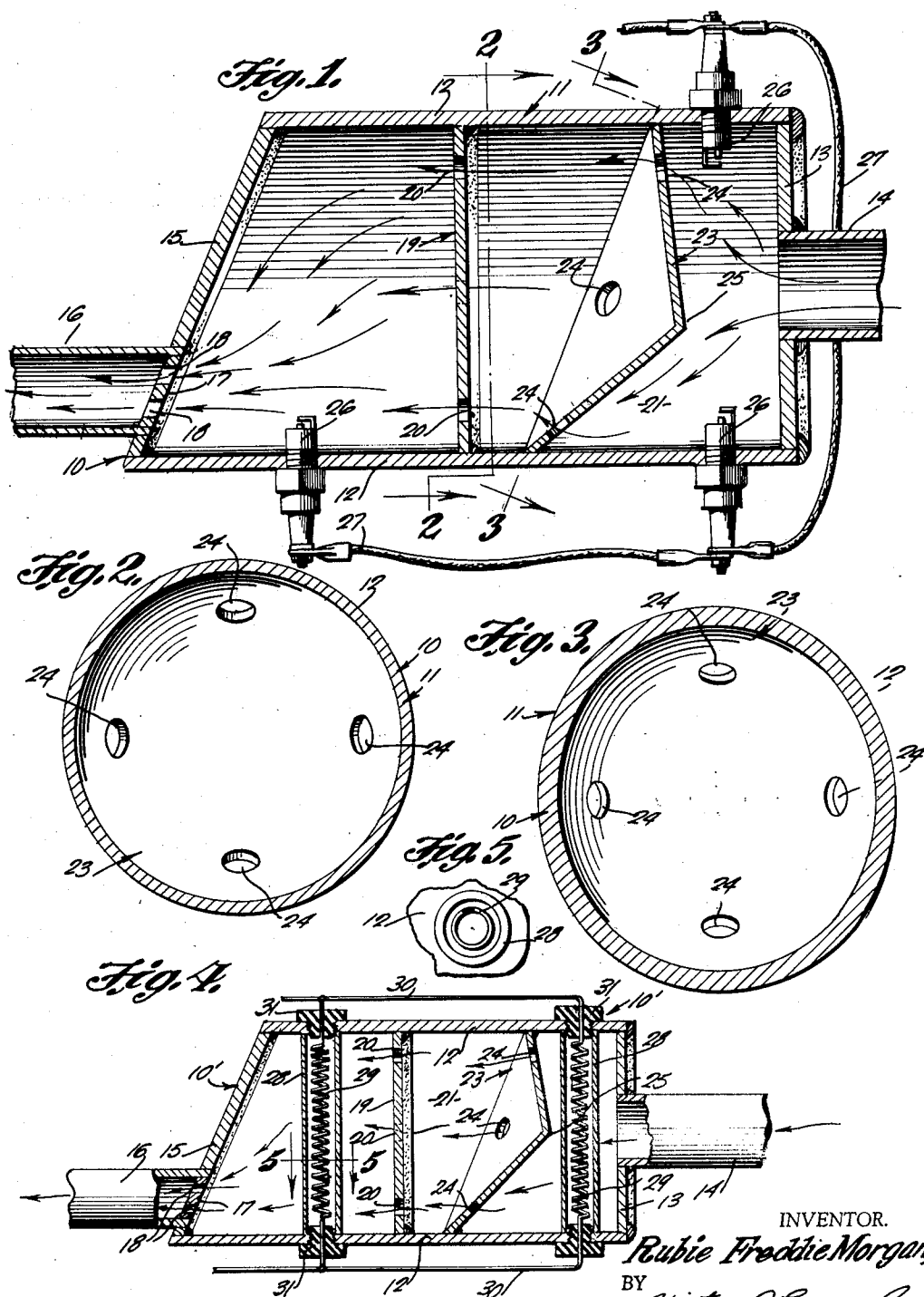
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FUME ELIMINATOR

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FUME ELIMINATOR

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The present invention relates to a device for eliminating or minimizing fumes, and more particularly to a device for eliminating or minimizing fumes that normally are discharged by a vehicle such as an automobile, truck, bus or the like.

The primary object of the present invention is to provide a fume eliminator which is adapted to be mounted in a convenient location in a vehicle, as for example the fume eliminator of the present invention is adapted to be conveniently installed or mounted between the vehicle exhaust manifold and the vehicle muffler so that unburned gases, fumes or the like will be fully ignited whereby smog, fumes or the like will not be discharged into the atmosphere.

Another object of the present invention is to provide a fume eliminator which includes a housing or body member that is adapted to be connected to a source of supply of gases to be treated, and wherein there is mounted in the device of the present invention an apertured partition and a cone shaped apertured baffle, and wherein there is further provided a heating means for helping to burn up or ignite fumes or the like so that the present invention will help prevent contamination of the air from fumes, unburned foreign matter or the like.

Another object of the present invention is to provide an apparatus of the type stated which is rugged in structure and foolproof in operation and which is economical to manufacture and efficient in use.

Further objects and advantages are to provide improved elements and arrangements thereof in a device of the character described that is economical to produce, durable in form, and conducive to the most economical use of materials and uniformity of members formed therefrom.

Still further objects and advantages will become apparent in the subsequent description in the specification.

In the drawings:

FIGURE 1 is a longitudinal sectional view taken through the fume eliminator of the present invention.

FIGURE 2 is a sectional view taken on the line 2-2 of FIGURE 1.

FIGURE 3 is a sectional view taken on the line 3-3 of FIGURE 1.

FIGURE 4 is an elevational view, with parts broken away and in section, illustrating a modification.

FIGURE 5 is an enlarged sectional view taken on the line 5-5 of FIGURE 4.

Referring in detail to the drawings, and more particularly to FIGURES 1, 2 and 3 of the drawings, the numeral 10 indicates the fume eliminator of the present invention which is shown to comprise a hollow housing or body member which is indicated generally by the numeral 11, and the housing 11 includes a generally cylindrical wall member 12, and there is provided a first end wall 13 which is mounted in one end of the housing, and the end wall 13 may be secured as by welding to the adjacent portions of the wall member 12. The numeral 14 indicates an endless conduit which is suitably affixed as by welding to the end wall 13, FIGURE 1, and the conduit 14 is adapted to be connected to a suitable source of supply of gaseous products, as for example the conduit 14 may be connected to the engine exhaust manifold.

As shown in FIGURE 1 there is further provided a slanting or inclined second end wall 15 which is secured as by welding to the opposite end of the housing 11 from the end wall 13, and the end wall 15 is arranged angular-

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ly with respect to the first end wall 13. The numeral 16 indicates an outlet conduit which is suitably secured as by welding to the second end wall 15, and the outlet conduit 16 may be connected to the vehicle muffler. The numeral 17 indicates a wall piece which is arranged in the same plane as the end wall 15, and the wall piece 17 is arranged in registry or alignment with an end of the conduit 16, and the wall piece 17 has a plurality of apertures or openings 18 therein, FIGURE 1.

There is further provided a partition 19 which is interposed between the walls 13 and 15, and the partition 19 is adapted to be secured as by welding to the inner surface of the wall member 12, and the partition 19 is arranged in spaced parallel relation with respect to the end wall 13, the partition 19 having a plurality of spaced apart apertures or openings 20 therein for a purpose to be later described. The partition 19 defines within the housing first and second spaced apart separated compartments or chambers 21 and 22.

The numeral 23 indicates a cone shaped inclined baffle which is arranged in the first compartment 21, and the baffle 23 is interposed between the end wall 13 and partition 19, and the baffle 23 has a plurality of spaced apart apertures 24 therein, and as shown in the drawings the apex 25 of the baffle 23 faces towards the end wall 13.

There is further provided a heating means which in FIGURE 1 is shown to comprise spark plugs 26 which are adapted to be connected to a suitable source of electrical energy by means of wires or conductors 27.

Referring now to FIGURES 4 and 5 of the drawings, there is illustrated a modified fume eliminator which is indicated generally by the numeral 10', and the fume eliminator 10' has a construction and function which is generally the same as described in connection with the eliminator 10. However, a different heating means is used in FIGURES 4 and 5, and it will be seen that in FIGURES 4 and 5 hollow tubes or casings 28 are mounted in the compartments 21 and 22, and spiral heating elements 29 extend longitudinally through the tubes 28, and these heating elements 29 are adapted to be connected to a suitable source of electrical energy as for example by means of wires or conductors 30, and the heating elements can thus be connected into the electrical system of a vehicle or the like. The numeral 31 indicates insulated plugs which are mounted in the wall member 12 adjacent the ends of the tubes 28.

From the foregoing, it is apparent that there has been provided a fume eliminator, and in use with the parts arranged as shown in the drawings, and in particular as shown in FIGURES 1, 2 and 3 of the drawings, it will be seen that the conduit or pipe 14 is adapted to be connected to a member such as the outlet of the usual exhaust manifold of an internal combustion engine such as the engine of an automobile or other vehicle, whereby the exhaust gases from the vehicle engine will flow or travel from right to left in FIGURES 1 and 4. As the exhaust gases enter the compartment 21 through the conduit 14, the exhaust gases impinge against the adjacent surfaces of the baffle 23, and due to the clamping or inclined arrangement of the baffle 23, it will be seen that the exhaust gases will have a tendency to be spread around or dispersed so that these exhaust gases will be directed into engagement with the spark plugs 26, and with the spark plugs 26 suitably electrically connected in the vehicle electrical or ignition system, it will be seen that any unburned gases entering the compartment 21 will be ignited by the spark plugs 26 so as to insure that there will be complete combustion. After such gases are acted upon by the spark plugs 26 in the compartment 21, the gases flow through the apertures 24 and then flow through the openings or apertures 20 in the partition 19 and these gases then enter into the compartment 22 and any remain-

ing unburned gases or particles entering the compartment 22 will be acted on by the spark plugs 26 which are in communication with the compartment 22 so that such unburned particles or gases will be further ignited and burned to complete combustion thereof. The gases, after having been fairly burned, will flow out through the apertures 18 and through the conduit 16, and the conduit 16 may be connected to a conventional vehicle muffler or the like as desired or required.

It is to be noted that the partition 19 is arranged in spaced parallel relation with respect to the end wall 13, and the end wall 15 is arranged at an angle with respect to the partition 19 so that these parts will have a tendency to help temporarily hold the gases in their desired location such as in the compartments a sufficient period of time to permit combustion to take place. The number of openings or apertures in the various elements can be varied as desired or required to provide a means of regulating the speed of flow of the gases through the device of the present invention in order to provide a means for controlling the rate or degree of combustion.

In the modification of FIGURES 4 and 5 which is indicated by the numeral 10', instead of using the spark plugs 26, the heating elements 29 are used, and these heating elements 29 are adapted to be electrically connected in the electrical circuit of the vehicle by means of the wires 30, and insulated plugs 31 are provided adjacent the ends of the tubes 23 for helping to insure that the various electrical elements are properly insulated and located in the apparatus. The elements 29 are adapted to be maintained at a sufficient temperature so that unburned particles or gases flowing through the compartments 21 and 22 will be ignited by the hot elements 29 in order to insure that unburned gases or the like will not enter the vehicle muffler.

The fume eliminator of the present invention is adapted to prevent backfiring from mufflers since the present invention will help prevent raw or unburned gas from entering the muffler and by preventing such raw or unburned gas from entering the muffler, backfiring will be minimized or prevented.

The size of the apertures or openings in the various elements as well as the number thereof can be changed or varied as desired in order to provide a means for regulating or controlling the action of the device, and the end walls as well as the partition and baffle are positioned at angles relative to each other so that the gases traveling through the device will be temporarily held the proper length of time in order to insure the most efficient action by the igniting members such as the spark plugs 26 or igniting or heating elements 29. The present invention also helps eliminate odors being discharged from a vehicle or the like since such odors often result from unburned gas being discharged into the atmosphere, and since unburned gas is fully consumed or ignited with the present invention, such source of odors will be eliminated or minimized.

The heating elements may consist of glo plugs, spark plugs, electric heating elements or the like. The parts are arranged so that the incoming gases are restricted sufficiently long to permit combustion of unburned gases or the like to readily take place. The holes or openings are adapted to be made of a predetermined size and the number and spacing of these openings or holes is such that

the combustion will take place in the required or desired manner.

Although the invention herein described is fully capable of achieving the objects and providing the advantages hereinbefore mentioned, it is to be understood that it is merely illustrative of the presently preferred embodiment of the invention and that it is not to be limited to the details of construction herein described other than as defined in the appended claims.

What is claimed is:

1. In an exhaust fume eliminator for an internal combustion engine including end walls, a cylindrical wall member having its ends fixed to the peripheries of said end walls, one of said end walls having an inlet adapted for connection to the exhaust pipe of an internal combustion engine and the other end wall having an outlet adapted for connection to an exhaust conduit, said outlet being positioned at an outer periphery of said other end wall, and a partition arranged in said cylindrical wall member in spaced parallel relation with respect to one of said end walls, said partition defining in said cylindrical wall member first and second compartments, there being a plurality of spaced apart apertures in said partition, a cone-shaped inclined baffle positioned in said first compartment extending to said cylindrical wall member, said cone-shaped inclined baffle having its apex generally directed toward said inlet, at least one electrical means positioned in each of said first and second compartments for igniting exhaust fumes from said internal combustion engine, and said cone-shaped inclined baffle having a plurality of spaced apart apertures therein for spreading around and dispersing exhaust gases so that said gases will be directed into engagement with said electrical means in said first compartment.

2. The exhaust fume eliminator of claim 1 wherein said electrical means is a hollow tube mounted in each of said compartments on opposite sides of said partition, each end of said hollow tube being in registry with an opening in said cylindrical wall member, insulated plugs in said openings in said cylindrical wall member closing the ends of said hollow tubes, and a spiral heating element extending substantially longitudinally through each of said tubes and the adjacent plugs and having ends thereof each adapted to be connected to a source of electrical energy, whereby heat produced by said hollow tube ignites exhaust fumes from the internal combustion engine.

3. The exhaust fume eliminator of claim 1 wherein said electrical means is at least one spark plug mounted in each of said compartments on opposite sides of said partition, each of said plugs of the first compartment mounted between said cone-shaped inclined member and said inlet, each of said spark plugs adapted to be connected to a source of electrical energy, whereby a spark produced by said spark plugs will ignite exhaust fumes from the internal combustion engine.

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