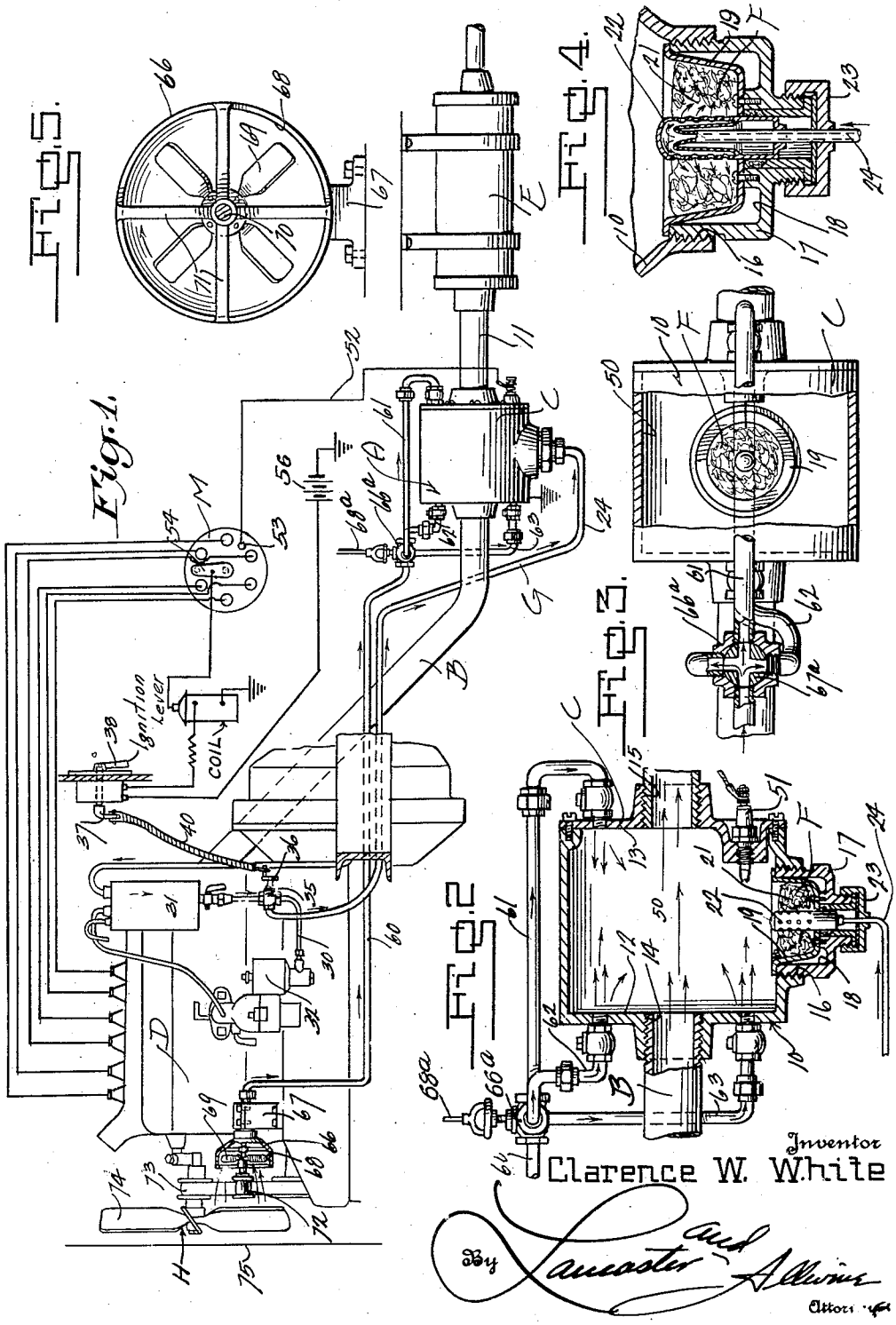
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APPARATUS FOR TREATING INTERNAL COMBUSTION ENGINE EXHAUSTS

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APPARATUS FOR TREATING INTERNAL COMBUSTION ENGINE EXHAUSTS

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This invention relates to improvements in apparatus for converting carbon monoxide of internal combustion engine exhaust gases to carbon dioxide and harmless gases.

The primary object of the invention is the provision of apparatus for passing the exhaust gases from an internal combustion engine to a compartment wherein a flame or fire is disposed, in the presence of fresh atmospheric air, for the purpose of supporting combustion to eliminate the objectionable carbon monoxide gases and convert the same into carbon dioxide.

A further object of this invention is the provision of carbon monoxide eliminating apparatus adapted to be placed in the exhaust gas line of internal combustion engines, embodying a fuel burner fed from the fuel line of the conventional automobile system, operating in the apparatus upon the exhaust gases; the apparatus including improved means for feed of fresh atmospheric air to the apparatus for supporting combustion in order that the flame may eliminate the objectionable carbon monoxide gas and objectionable odors.

Other objects and advantages of this invention will be apparent during the course of the following detailed description.

In the accompanying drawings forming a part of this specification, and wherein similar reference characters designate corresponding parts throughout the several views:

Figure 1 is a fragmentary side elevation, partly diagrammatic, showing the relation of the improved apparatus with respect to an internal combustion engine and a conventional exhaust gas line therefor.

Figure 2 is a fragmentary sectional view taken through the improved apparatus adjacent the carbon monoxide eliminating receptacle or container.

Figure 3 is a fragmentary sectional view of details illustrated in Figure 2, showing the same in plan.

Figure 4 is an enlarged fragmentary sectional view taken through the burner pot of the apparatus.

Figure 5 is a fragmentary front view of a fan adapted to be used for forced feeding of atmospheric air into the combustion compartment of the apparatus.

In the drawings, wherein for the purpose of illustration is shown only a preferred embodiment of the invention, the letter A may generally designate the apparatus, adapted to be used in the exhaust gas line B leading from an internal combustion engine D conventionally applied to an automotive vehicle. The apparatus A includes the carbon monoxide eliminating receptacle C fixed in the fuel line B between the muffler E and the engine D, having a burner pot F therein with fuel feed means G connected with the conventional fuel feed system of the automobile of which the engine D is a part; improved means H being provided for force feed of atmospheric air to the container C in a relation to be subsequently described.

Container C includes a tank body 10 preferably cylindrically formed, although the same may be formed in any approved manner, having the axis thereof disposed in axial alignment with a horizontal portion 11 of the exhaust pipe B, the tank body 10 has oppositely disposed walls 12 and 13 provided with screw threaded openings 14 and 15 therein to receive the externally screw threaded ends of the sections of the exhaust pipe B as illustrated in Figure 2 of the drawings.

The bottom of the tank body 10 is provided with a screw threaded opening 16 therein adapted to detachably receive the pot construction F, which includes a supporting cap 17 externally screw threaded for detachable connection in the opening 16, the same being provided with a pocket 18 therein for receiving the fire pot 19, of some refractory, or other material, the pot 19 opening upwardly and therein supporting some absorbent material 21, such as cotton, fiber, or the like, which may absorb and hold a quantity of liquid fuel. The pot 19 and cap 17 receive a perforated feed head or nozzle 22 upwardly therein, which is suitably supported in a leak proof connection in the cap 17, by means of a washer and nut arrangement 23, through which the fuel line 24 extends. The fuel line 24 may extend from the

receptacle or container C upwardly for connection in the liquid feed line 30 leading from the conventional vacuum tank 31 to the carburetor 32 of the engine D. Adjacent the juncture of the fuel line 24 in the line 30, is disposed a valve 35 for cutting off the flow of the liquid fuel through the line 24; the valve 35 including a crank handle 36 having connection with a crank handle 37 attached to the shaft of the conventional ignition switch 38 of the internal combustion engine ignition system, as shown in Figure 1, the cranks 36 and 37 being connected by conventional flexible shafting 40, so that when the ignition lever is turned to an "on" position, the valve 35 will be opened, and when the ignition lever 38 is turned to an "off" position, to shut off the ignition from the engine D, the valve 35 will be closed to shut off flow of liquid fuel through the line 24 to the burner pot F.

A pilot light is desirable in the compartment 50 of the crank or container C, and to this end a spark plug 51 is preferably provided, having a pair of electrodes, one of which is grounded on the tank 10, and the other of which is relatively insulated with the tank 10, and is connected by means of a wire or line 52 to a contact insert 53 on the conventional race of an ordinary automobile distributor M, which may be part of the ignition system of the engine D. A distributor arm 54 operates over the contact 53, at intervals, and in the circuit with the spark plug 51 is disposed a storage battery 56.

In order to support combustion in the container chamber 50, and to thoroughly burn up and eliminate objectionable gases, fresh atmospheric air will have to be fed thereto. and to this end a conduit 60 is provided, thru which air is forced, having branch connections 61, 62 and 63 leading to the walls 12 and 13, and inletting at various positions in the compartment 50; the admission of air to the compartment 50 thru either of the branch pipes 61, 62 or 63 being controlled by a preferably four-way valve 66^a, see Figure 3, having a valve head 67^a operable therein and controlled by handle 68^a, see Figure 1, which may lead to any convenient location in the driver's compartment of the vehicle, of which the engine D may be a part.

The means H furthermore contemplates the provision of a forced feed of air through the line 60, and to this end a forwardly flaring opened hood 66 may be placed at the forward end of the conduit 60, suitably supported by brackets 67 on the forward part of the internal combustion engine, casing or housing; the flaring hood 66 having a forwardly open compartment 68 therein, wherein a small fan 69 is rotatably mounted upon a shaft 70; the shaft 70 being suitably supported in a horizontal position by bracket arms 71 on the hood 66; the shaft 70 forwardly extending beyond the hood and there having a pulley 72 keyed therewith and operating on the conventional belt 73 used to drive the ordinary water cooling fan 74 which sucks the air thru the radiator 75 of the internal combustion engine D.

In comparative relation the fan 69 is much smaller than the fan 74, and placed to the rear thereof where the air from the fan 74, or a part thereof, may be drawn into the hood 66 by reason of operation of the fan 69, which is driven by the belt 73; the air being forced thru the conduit 60 and then to the branch conduits 61, 62 and 63, if the valve 66^a is open, and forced into the compartment 50 for supporting combustion therein.

The air is thus fed into the eliminator compartment 50 in quantities sufficient to enable combustion, and to act with an oxidizing influence on the carbon monoxide, tending to eliminate the same and convert the carbon monoxide into carbon dioxide and harmless gases.

From the foregoing it can readily be observed that apparatus has been provided, of a practical nature, to be used in connection with conventional exhaust lines of internal combustion engines, for the treatment of carbon monoxide exhaust gases for rendering the same harmless.

Various changes in the shape, size, and arrangement of parts may be made to the form of invention herein shown and described, without departing from the spirit of the same or the scope of the claim.

I claim:

In combination with an internal combustion engine having an ignition system including an ignition switch, an exhaust conduit, a container in the exhaust conduit having a compartment into which exhaust gases flow, burner means in the container, valve controlled means for feeding fuel to the burner means, means to supply air for combustion of the fuel in said compartment, means controlled by the said ignition switch of the engine for operating said valve to open it when the ignition switch is closed, a spark plug in the container having electrodes in cooperating adjacent relation with the burner means, and means operatively placing the spark plug in the ignition system of the engine of which the ignition switch is a part.

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