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B. F. COURT
ENGINE MUFFLER

3,031,824

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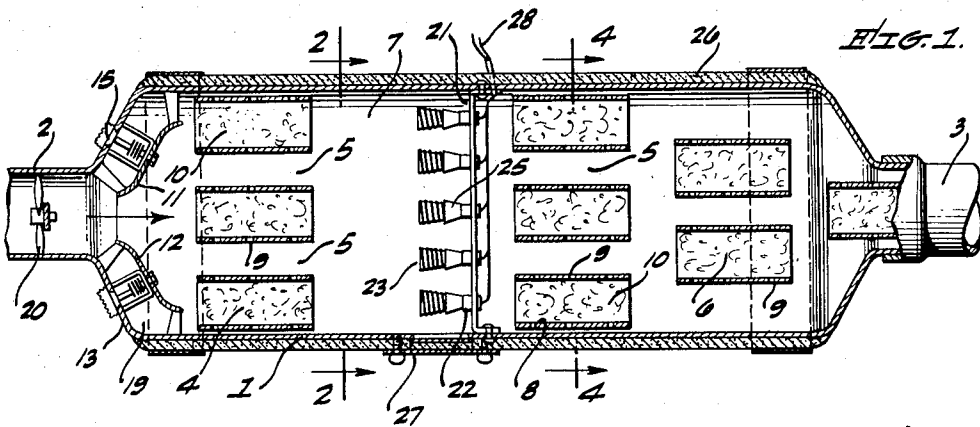


FIG. 1.

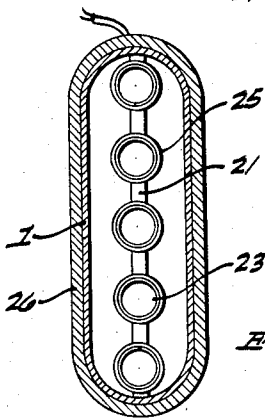


FIG. 2.

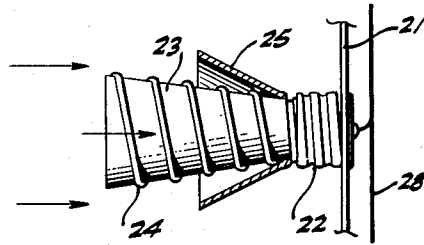


FIG. 3.

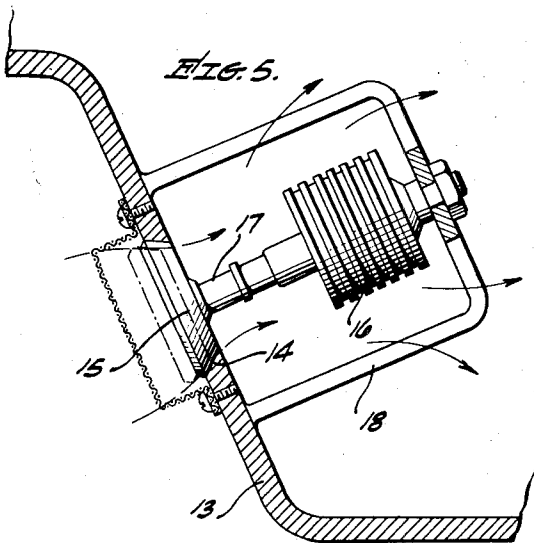


FIG. 5.

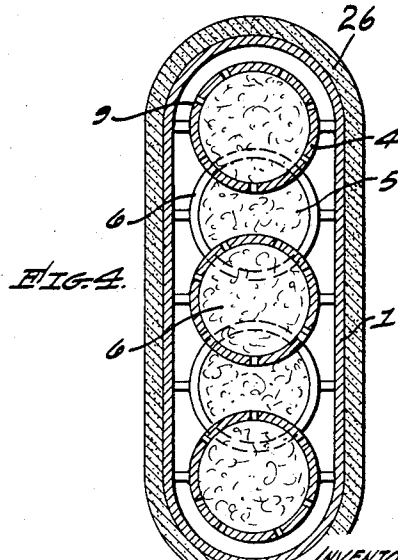


FIG. 4.

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ENGINE MUFFLER

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6 Claims. (Cl. 55-217)

This application is a continuation in part of my co-pending application on Engine Muffler, Serial Number 701,007, filed December 6, 1957, now abandoned.

This invention relates to an engine muffler, and particularly for the engine of vehicles, the purpose being to more effectively muffle the engine exhaust noises and also to filter or strain out the various entrained solids in the exhaust gases so that these solids are not continuously blown into the air.

Another object of my invention is to provide a novel engine muffler in which a means is provided to admit outside air to the muffler for the purpose of mixing this added air to the exhaust gases, for the purpose of diluting the gases and thus reducing the noxious qualities of the exhaust gases at the outlet of the muffler.

Another object is to provide a simple, effective, and relatively inexpensive muffler which has the above defined qualities.

Still another object of my invention is to provide a means of burning the exhaust gases in the muffler, these reburned gases reducing the carbon monoxide content of the gas emitted by an internal combustion motor, the exhaust gases being ignited by continuously glowing electrical coils positioned within the muffler.

Other objects, advantages and features of invention may appear from the accompanying drawing, the subjoined detailed description and the appended claims.

In the drawing:

FIGURE 1 is a longitudinal sectional view of my muffler.

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

FIGURE 3 is a transverse sectional view of one of the burners within the muffler.

FIGURE 4 is a sectional view taken on line 4-4 of FIG. 1.

FIGURE 5 is a fragmentary transverse sectional view on an enlarged scale of one of the thermostatic valves in the muffler.

Referring more particularly to the drawing, my muffler includes an elongated cylinder-like housing 1 which is flattened transversely, as shown in FIGURE 2, although if desired the housing may be truly cylindrical in shape. An intake pipe 2 extends into one end of the housing. The exhaust gases enter the housing 1 through the pipe 2 and are emitted through the pipe 3 and thence into the atmosphere in the usual manner. In order that the exhaust sounds of the engine may be muffled I provide a plurality of relatively short cylinders 4 within the housing 1. These short cylinders are arranged in groups longitudinally of the housing 1 and are spaced so that some of the gases will pass the groups of tubes 4, while other parts of the exhaust gases will pass through the tubes. Thus spaces 5 are provided through which the exhaust gases may freely pass, and directly opposite these free passages 5 I provide the adjacent group of tubes 6 which, being directly aligned with the passages 5, will receive a major part of the exhaust gases therein, but again certain parts of the exhaust gases will pass through the adjacent passages 7. Again the adjacent sets of tubes 8 are positioned opposite the passages 7 to receive the gases, and this construction continues throughout the length of the muffler housing. Thus there are provided groups of tubes 4, 6, 8, etc., through which a part of the exhaust gases will pass, and adjacent openings, spaces or ports 5, 7, etc., through which the exhaust gases may pass without going

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directly through one of the baffling tubes. The exhaust gases thus move through a tortuous passage and are continuously trapped, retarded and muffled by passing through relatively short tubes such as 4, 6, 8, etc. The tubes are all substantially identical in construction and the walls of the tubes are provided with holes or openings 9 through which the exhaust gas can pass. The tubes are also loosely packed with asbestos as indicated at 10. This asbestos packing of the tubes 4, 6, 8, etc., further provides a baffling or deflecting action on the exhaust gases, as will be evident.

Adjacent the intake end of the housing 1, I provide a pair of baffles 11 and 12 which are spaced from the end wall 13 of the housing 1. Within the end wall 13 I provide ports or openings 14 of which I have here shown two. These ports or openings are controlled by a thermostatic valve 15 which, when the housing 1 is cold, is seated in the opening 14. A metallic bellows 16 is mounted on the stem 17 of the valve 15 and the bellows is also attached to a frame 18 at one end thereof, which frame is secured to the end wall 13 of the housing 1. As the exhaust gases pass the thermal unit 16 this thermal unit will expand and will lift the valve 15 off of its seat 14, thus permitting fresh outside air to enter the housing 1 and admix with the exhaust gases which are moving through the passage 19 between the baffle 12 and the end wall 13. Thus fresh uncontaminated air is drawn into the muffler and when mixed with the exhaust gases will somewhat dilute these gases and reduce the noxious effect thereof.

A freely rotating fan 20 may be mounted in the intake pipe 2 adjacent to the muffler 1. This fan is rotated by the exhaust gases and tends to mix and distribute the gases more effectively at the entrance to the muffler 1 so that the exhaust gases spread throughout the diameters of the muffler and will thus tend to move outwardly into the passages 19, as well as centrally into the muffler, and will thus more effectively distribute the gas and also muffle the sound of the same.

Mounted within the housing 1 of the muffler, and preferably arranged between the groups of short cylinders 4, I provide a frame 21 which is fixedly attached to the inside of the housing. A plurality of sockets 22 are secured to the frame 21 and each of these sockets is adapted to receive a glow heater, the coil 24 of which is caused to glow by the passage of electric current therethrough. A baffle 25 is provided on each of the heating or ignition elements 23 so that the exhaust gases, while passing longitudinally through the muffler, are trapped or directed inwardly against the heated coil 24 to ignite these gases. The exhaust gases which pass through the exhaust pipe 2 and thence into the muffler housing 1 contain a large quantity of carbon monoxide, and these exhaust gases are mixed with fresh air which is inducted into the muffler through the thermal valves 15, thus providing a combustible mixture which is ignited by the burners 23 as the gases pass over these burners while moving from one end to the other of the muffler. The burned residue then passes through the various baffle tubes 4 which are arranged within the muffler and between the burners 23 and the outlet of the muffler. This additional burning of the exhaust gases reduces the carbon monoxide content of the gas and reduces eye irritation and other harmful reactions. An asbestos cover 26 is provided around the muffler housing 1 to dissipate the heat within the muffler. A port hole cover 27 is also provided through the housing 1 of the muffler to permit access to the heating elements 23 so that these elements may be replaced, as necessary. The necessary current to supply the coils 24 is conducted to each of the heating elements 23 through the wire 28 which extends from a suitable manual switch (not shown),

and also from the usual battery of the vehicle which also is not shown.

Having described my invention, I claim:

1. A muffler comprising an elongated housing, an intake pipe extending into one end of the housing, an outlet pipe extending from the end of the housing opposite the intake pipe, a plurality of groups of tubes positioned within the housing and spaced longitudinally of the housing and between the intake and exhaust pipes, said tubes having openings at both ends and being spaced from each other in each group to permit gases to flow around each tube as well as through the tubes, and each tube having holes through the wall thereof, a baffle within the housing adjacent the intake pipe, said baffle being spaced from the wall of the housing, said housing having an air intake port therein adjacent said baffle and a thermally controlled valve seated in said port, said baffle deflecting part of the gases around the thermally controlled valve.
2. A muffler comprising an elongated housing, an intake pipe extending into one end of the housing, an outlet pipe extending from the end of the housing opposite the intake pipe, a plurality of groups of tubes positioned within the housing and arranged between the intake and exhaust pipes, said tubes being open at both ends and spaced from each other in each group to permit gases to flow around each tube as well as through the tubes, and each tube having holes through the wall thereof, and electrical heating means within said housing arranged between adjacent groups of said tubes and spaced transversely of the housing.
3. A muffler comprising an elongated housing, an intake pipe extending into one end of the housing, an outlet pipe extending from the end of the housing opposite the intake pipe, a plurality of groups of tubes positioned within the housing and arranged between the intake and exhaust pipes, said tubes being open at both ends and spaced from each other in each group to permit gases to flow around each tube as well as through the tubes, and each tube having holes through the wall thereof, said housing having an air intake port therein and a thermal valve seated in said port, and electrical heating means within said housing arranged between adjacent groups of said tubes, and spaced transversely of the housing.
4. A muffler comprising an elongated housing, an intake pipe extending into one end of the housing, an outlet pipe extending from the end of the housing opposite the intake pipe, a plurality of groups of tubes positioned within the housing and spaced longitudinally of the housing and between the intake and exhaust pipes, said tubes being open at both ends and spaced from each other in each group to permit gases to flow around each tube as well as through the tubes, and each tube having holes

through the wall thereof, a baffle within the housing adjacent the intake pipe, said baffle being spaced from the wall of the housing, said housing having an air intake port therein adjacent said baffle and a thermally controlled valve seated in said ports, and electrical heating means within said housing arranged between adjacent groups of said tubes, said baffle deflecting part of the gases around the thermally controlled valve.

5. A muffler comprising an elongated housing, an intake pipe extending into one end of the housing, an outlet pipe extending from the housing, a plurality of groups of tubes positioned within the housing and arranged between the intake and exhaust pipes, said tubes being open at both ends and spaced from each other in each group to permit gases to flow around each tube as well as through the tubes, and each tube having holes through the wall thereof, said housing having an air intake port therein and a thermally controlled valve seated in said port, a frame within and extending across said housing, said frame being positioned between adjacent groups of tubes and a plurality of electrical glow elements mounted on said frame.

6. A muffler comprising an elongated housing, an intake pipe extending into one end of the housing, an outlet pipe extending from the end of the housing opposite the intake pipe, a plurality of groups of tubes positioned within the housing and spaced longitudinally of the housing and between the intake and exhaust pipes, said tubes having openings at both ends and are spaced from each other in each group to permit gases to flow around each tube as well as through the tubes, and each tube having holes through the wall thereof, a baffle within the housing adjacent the intake pipe, said baffle being spaced from the wall of the housing, said housing having an air intake port therein adjacent said baffle and a thermally controlled valve seated in said ports, a frame within and extending across said housing, said frame being positioned between adjacent groups of tubes and a plurality of electrical glow elements mounted on said frame.

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