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[54] MUFFLER WITH PLURAL INLETS AND OUTLETS

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181/47, 48, 46, 54, 55, 56, 57, 59, 60

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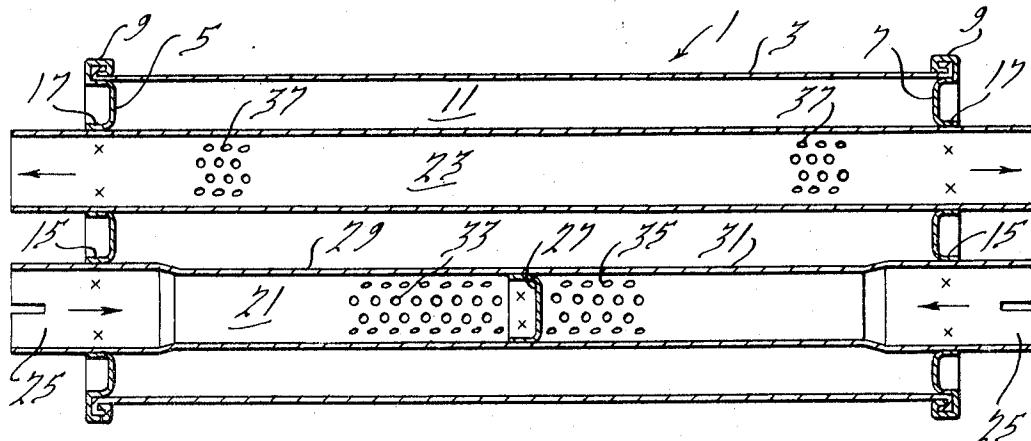
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[57] ABSTRACT

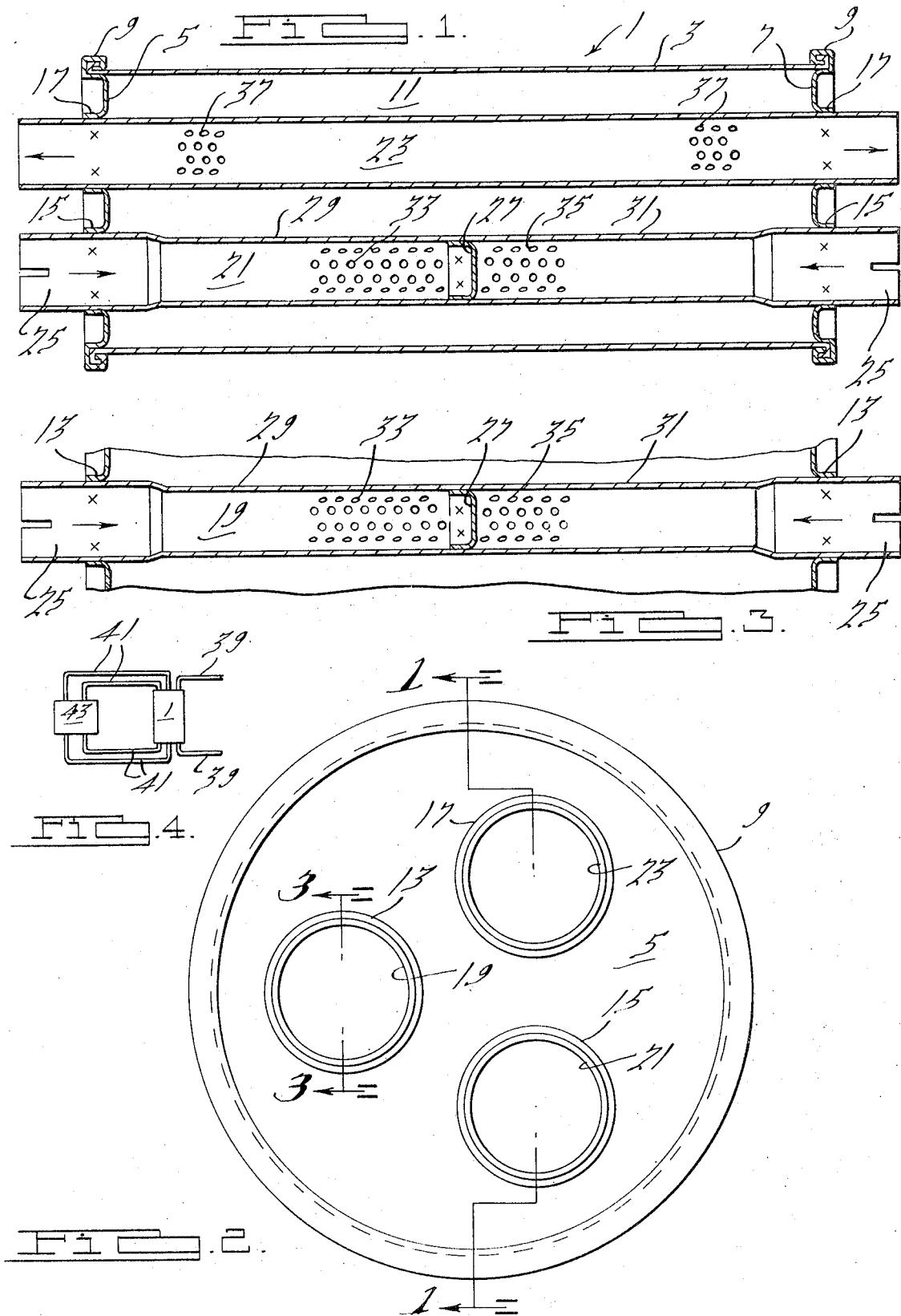
A muffler has four inlets and two outlets opening into a sound attenuating chamber.

7 Claims, 4 Drawing Figures



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MUFFLER WITH PLURAL INLETS AND OUTLETS**BRIEF SUMMARY OF THE INVENTION**

It is the purpose of this invention to provide a muffler that may be used with internal combustion engines that would normally require complicated header systems in order to use ordinary single or dual inlet mufflers. The muffler of the invention has four inlets and allows simply designated pipes to be used to connect the cylinder exhaust ports to the muffler. Preferably, the muffler has two outlets.

DESCRIPTION OF THE DRAWINGS

FIG. 1 is a longitudinal cross section through a muffler embodying the invention as taken on line 1—1 of FIG. 2;

FIG. 2 is an enlarged end view taken from the left of FIG. 1;

FIG. 3 is a section along the line 3—3 of FIG. 2; and

FIG. 4 is a diagram of an exhaust system using a muffler according to the invention.

In the drawing, the symbol "x" indicates a spotweld or the equivalent.

DESCRIPTION OF THE INVENTION

The muffler 1 comprises a tubular shell 3 that is closed at opposite ends by headers 5 and 7 which are secured to ends of the shell in interlocked, gas-tight joints 9. The space enclosed by the shell and headers comprises a chamber 11.

Each header has three outwardly extending necks 13, 15, and 17, the respective necks or headers 5 and 7 being aligned on straight lines parallel to the longitudinal axis of the shell 3. Three straight tubes 19, 21, and 23 extend between and through and are supported in the pairs of necks 13, 15, and 17, respectively, preferably being spotwelded as indicated by the "x's." The tubes are preferably arranged in the manner shown in FIG. 2. The tubes 19 and 21 comprise inlet tubes and have their outer ends enlarged and slotted whereby they form four inlet bushings, as seen at 25, to receive and be clamped to four inlet pipes carrying gas from an engine. Each inlet pipe has an imperforate partition 27 spotwelded in it to subdivide the pipe into two substantially equal inlet sections 29 and 31. Adjacent the partition 27 the sections 29 each has a patch of perforations 33 and the sections 31 each has a patch of perforations 35. The patch of perforations 33 is preferably slightly longer than the patch of perforations 35 and therefore of slightly greater area. The perforations in tubes 19 and 21 discharge gas into chamber 11.

The tube 23 forms an outlet tube and receives gas through two substantially identical patches of perforations 37 located adjacent to but inwardly spaced from the headers 5 and 7 by a distance that is preferably a little greater than the length of each patch. The length (and area) of the patches of perforations 37 is preferably a little less than half that of the patches of perforations 33 and 35. The outlet tube patches are out of radial alignment with the inlet tube patches. The ends of the outlet tube 23 may be connected to tailpipe sections 39 (FIG. 4) to conduct gas to atmosphere.

In operation, each of the four inlet bushings 25 will normally be connected by exhaust pipes 41 to different cylinders of an engine 43. The exhaust gas will pass through the perforation patches with some silencing

and enter the large chamber 11 where a major amount of acoustic energy is lost, there being a further attenuating effect as the gas passes through perforations 37 to enter the outlet tube 23.

Thus, the invention provides a simple muffler construction that is especially suitable for use in the exhaust systems of small automobiles having four cylinder engines as illustrated in FIG. 4.

Modifications in the specific details shown may be made without departing from the spirit and scope of the invention.

We claim:

1. A muffler comprising an outer tubular shell, headers closing opposite ends of the shell and acting with the shell to define a chamber, each header having three openings, three open-ended tubes extending longitudinally through the chamber and mounted at opposite ends in the openings in said headers, two of said tubes comprising inlet tubes and the third tube comprising an outlet tube, each of said tubes opening into said chamber, means forming partitions in said inlet tubes at a mid portion thereof to prevent gas flow from one end of the tube to the other, said inlet tubes providing four inlets for gas to enter the chamber and said outlet tube providing two outlets for gas to leave the chamber, said chamber being open so that gas can flow therein from the inlet tubes to the outlet tube.

2. A muffler as set forth in claim 1 wherein each of said tubes has patches of perforations opening into said chamber.

3. A muffler as set forth in claim 2 wherein said outlet tube has two patches of perforations each of which is located adjacent to but spaced inwardly from said headers, the major part of the length of the outlet tube being imperforate.

4. A muffler as set forth in claim 3 wherein said inlet tubes have patches of perforations located on opposite sides of said partition means and out of transverse alignment with said outlet tube patches.

5. A muffler as set forth in claim 1 wherein said inlet tubes have patches of perforations located on opposite sides of said partition means.

6. A muffler comprising an elongated outer tubular shell closed at opposite ends and defining an internal chamber, three open-ended tubes extending longitudinally through the chamber and supported at opposite ends by said shell, two of said tubes comprising inlet tubes and the third tube comprising an outlet tube, each of said tubes having openings adjacent its mid portion into said chamber and at one end outside of the chamber, means forming partitions in said inlet tubes at said mid portions thereof to prevent gas flow from one end of the tube to the other, said inlet tubes providing four inlets for gas to enter the chamber and said outlet tube providing two outlets for gas to leave the chamber, said chamber being open so that gas can flow therein from the inlet tubes to the outlet tube.

7. A muffler as set forth in claim 6 wherein said outlet tube has two patches of perforations each of which is located adjacent to but spaced inwardly respectively from opposite ends of the shell, the major part of the length of the outlet tube being imperforate, said inlet tubes having patches of perforations located on opposite sides of said partition means and out of transverse alignment with said outlet tube patches.

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