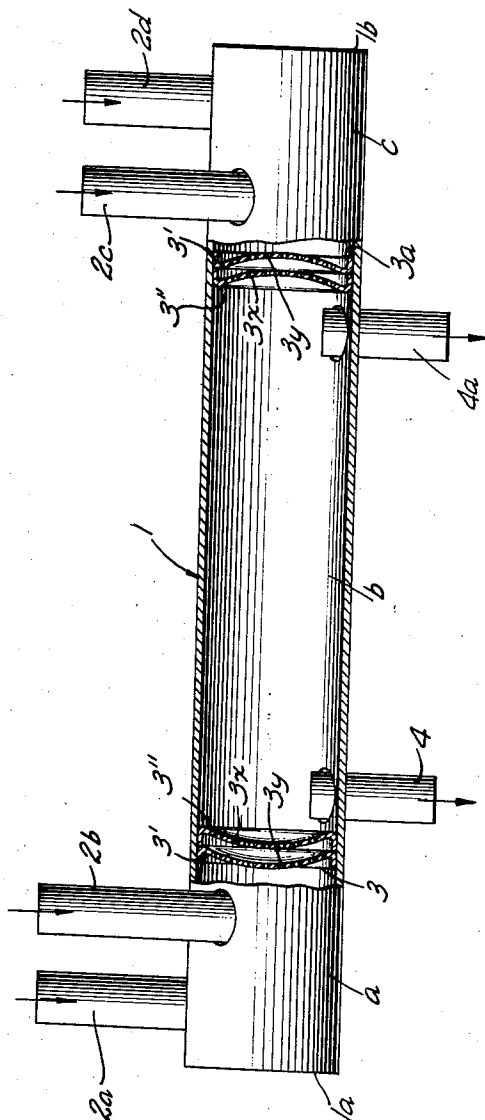


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CHAMBER DEFINING WALLS
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MUFFLER WITH DUAL PAIRS OF CURVED AND PERFORATED CHAMBER DEFINING WALLS

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3 Claims. (Cl. 181—56)

This invention relates in general to mufflers or sound dampeners and in particular to a new and useful sound absorber for combustion motors having several cylinders, including a longitudinally elongated container having inlet tube connections for exhaust gas which are directed into the container in a direction transverse to the longitudinal axis thereof.

In known sound absorbing devices or mufflers of this character, provisions have been made to compensate for the naturally different lengths of the exhaust tubes by prolonging the short tubes inside the sound dampening container. A disadvantage, however, is that the tubes which extend into the container require a considerable amount of additional space so that the size of the sound dampener has to be materially increased in order to achieve a certain capacity for sound absorption. In addition, resonances of the tubes occur which must be dampened by the sound absorber. Furthermore, vibrations of the various portions occur which lead to undesirable intensified sound irradiation and reflection.

In accordance with the present invention, there is provided a longitudinally elongated container into which noncompensated exhaust tubes are directed, preferably into opposite longitudinal ends of the container and transversely to the longitudinal axis. The ends are separated by a perforated divisionary wall from a central exit chamber which includes discharge conduits or pipes. In some instances, it is advantageous to curve the division walls in a direction toward the chambers in which the exhaust gases are introduced.

A feature of the invention is that the perforated large level division walls of the chamber act as an irradiator of a higher order through which the fractions of the sound waves of high frequency are smoothed by interference caused by the bending thereof. In those instances where several exhaust tubes are introduced into the chambers located at each end of the horizontally elongated container and separated from the central portion by the division walls, then aided by the effects of the returning sound caused by the irradiator in the closed volume of the antichambers, the shorter tubes in the sound dampening container undergo substantially the same accumulation effect as the longer tubes because the return charging time in the shorter exhaust tubes is shorter than in the longer inlet tubes. In this manner, it is not necessary that the shorter tubes be prolonged inside the sound dampening container, since the lengths of the tubes are effectively compensated for by the arrangement which includes the end chambers having perforated walls dividing it from the remaining portion of the chamber.

Accordingly, it is an object of this invention to provide an improved muffler construction.

A further object of the invention is to provide a sound baffling container having an end chamber into which exhaust gases are directed and including a perforated wall dividing the end chamber from the remaining portion of the container out of which the exhaust gases are discharged.

A further object of the invention is to provide a sound absorbing device including a longitudinally elongated container having end chambers defined by perforated division walls into which end chambers exhaust gases are

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directed and including a central chamber out of which the exhaust gases are discharged.

A further object of the invention is to provide a sound absorbing device which is simple in design, rugged in construction and economical to manufacture.

The various features of novelty which characterize the invention are pointed out with particularity in the claims annexed to and forming a part of this specification. For a better understanding of the invention, its operating advantages and specific objects attained by its use, reference should be had to the accompanying drawing and descriptive matter in which there is illustrated and described a preferred embodiment of the invention.

The only figure in the drawing is an elevation partly broken away view of a sound absorbing device for exhaust gases for internal combustion engines constructed in accordance with the invention.

Referring to the drawing in particular, the invention embodied therein includes a longitudinally elongated cylindrical container generally designated 1 indicated broken away in a central portion and which includes inlet exhaust conduits 2a and 2b connected adjacent an end 1a and inlet exhaust gas conduits 2c and 2d connected adjacent an end 1b. Each of the exhaust conduits 2a, 2b, 2c and 2d extend into the cylindrical container 1 in directions transverse to the longitudinal axis of the container. The exhaust gas tubes 2a, 2b, 2c and 2d conduct exhaust gases away from combustion engines (not shown). Since they are of different lengths, they exhibit conditions of resonance with corresponding sound amplifying and dampening effects so that the single columns of exhaust gas at one time transport a larger portion of long sound waves and at another time a larger portion of short sound waves.

In accordance with the invention, the container 1 is divided into end compartments or chambers a and c adjacent the inlets to the exhaust tubes 2a, 2b, 2c and 2d, respectively. This is accomplished by means of division walls or perforated members generally designated 3 and 3a arranged at spaced locations from end walls 1a and 1b, respectively. The perforated members advantageously include two spaced perforated walls 3', 3'' which are curved in directions toward the associated chambers a and c, respectively and the perforations 3x of wall 3' are advantageously of a different size than perforations 3y of wall 3''.

The perforated division walls 3 and 3a define therebetween a central chamber b which is connected to exhaust pipes or discharge conduits 4 and 4a for conducting away the exhaust gases.

Due to the perforated or sieve-like chamber partition walls 3 and 3a which serve as irradiators of a higher order, the quicker arising shorter pressure waves are reflected, that is, accumulated or pressed backwards due to the known effects of resonance with the elimination thereby of the differences of sound absorption and backward pressure caused by the different lengths of the exhaust gas tubes. The partition walls 3 and 3a include perforations of different sizes or dimensions and by means of such arrangement it is possible to control a phase displacement of the current of pressure waves flowing from chambers a and c toward the central chamber b where such waves meet and thereby it is possible to achieve an interference dampening.

While a specific embodiment of the invention has been shown and described in detail to illustrate the application of the inventive principles, it will be understood that the invention may be embodied otherwise without departing from such principles.

What is claimed is:

1. A muffler for combustion engines comprising an elongated vessel, first and second perforated walls in said

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vessel adjacent each end dividing said vessel into inlet chambers at each end and a central exit chamber with the inlet chambers being of a smaller size than said exit chamber and with the remainder of the interior of said vessel being substantially unobstructed, a plurality of inlet pipes for conducting exhaust gases from an engine connected into each of said inlet chambers substantially transverse to the longitudinal axis of said vessel, and a discharge conduit connected substantially transversely to the axis of said vessel from said exit chamber for discharging the exhaust gases which are delivered to the muffler.

2. A muffler for combustion engines, particularly for multicylinder combustion engines comprising an elongated vessel, first and second closely spaced perforated walls in said vessel positioned at a spaced location from each end of said vessel and dividing said vessel into let chambers at each end and a central exit chamber and with the remainder of the interior of said vessel being substantially unobstructed, a plurality of inlet pipes for conducting exhaust gases from an engine connected substantially transversely into each of said inlet chambers, and a discharge conduit connected substantially transversely into said exit chamber for discharging the exhaust gases which are delivered to the muffler.

3. A muffler for combustion engines, particularly for multicylinder combustion engines comprising an elongated vessel, first and second closely spaced perforated walls in said vessel positioned at a spaced location from each end of said vessel and dividing said vessel into inlet chambers

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at each end and a central exit chamber and with the remainder of the interior of said vessel being substantially unobstructed, a plurality of inlet pipes for conducting exhaust gases from an engine connected substantially transversely into each of said inlet chambers, and a discharge conduit connected substantially transversely into said exit chamber for discharging the exhaust gases which are delivered to the muffler, said perforated walls being curved toward the respective inlet chambers of said vessel and having perforations of varying sizes.

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