

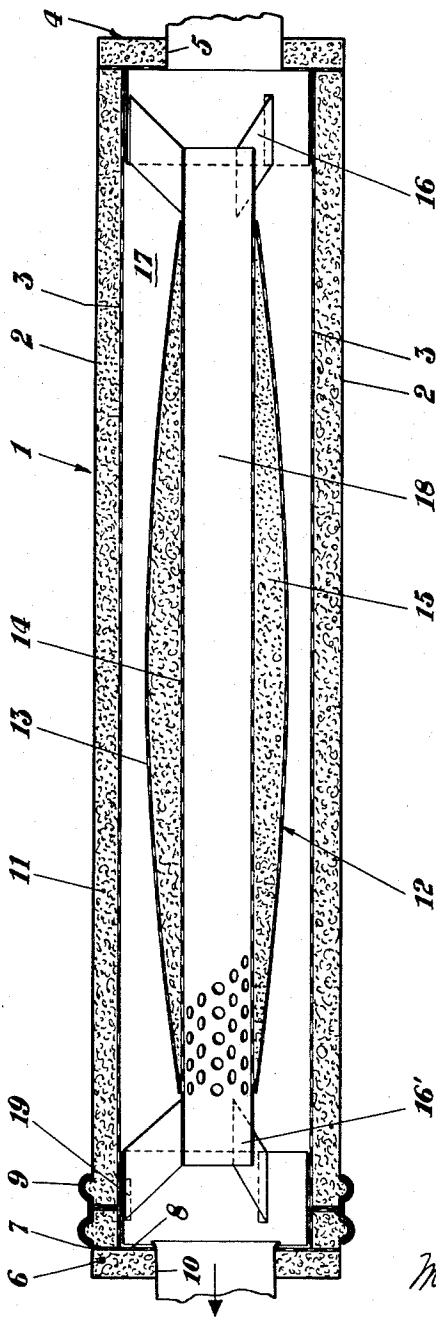
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MUFFLER FOR INTERNAL COMBUSTION ENGINES

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1

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MUFFLER FOR INTERNAL COMBUSTION ENGINES

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1 Claim. (Cl. 181—55)

The present invention relates to an improvement in mufflers to be assembled on the exhaust pipes of internal combustion engines, particularly for motor vehicles, motor cycles, and the like, said mufflers comprising a corrugated annular duct, with a highly sound-absorbent, deadening central core.

A device of this kind is known, consisting of a duct with an inner foraminated wall, provided lengthwise with a number of transverse undulations.

An object of the present invention is to provide an embodiment particularly effective and simple, which is capable of being applied to the exhaust pipes of internal combustion engines of any kind, and particularly to those of motor vehicles, wherein only one undulation exists between the inner wall of the outer duct and the inner body, and the deadening inner body has an axial bore. Further, in a preferred embodiment of this invention, the undulated shape of the annular outer duct is obtained only by means of the tapered shape of the axially bored central body, while the outer casing inner wall which is deadened and foraminated, has a substantially cylindrical shape.

Thus, according to the present invention, the device consists of an outer double walled metal casing, having preferably a cylindrical shape, the inner-wall of which consists of a foraminated metal sheet while the spacing between the two walls is filled with a deadening material, for instance long fiber glass wool, of the "Vetroflex" type or the like. The device comprises also a central removable core, either spindle shaped and smooth or lengthwise corrugated. The central core comprises a double walled member with a straight axial bore, free from bargages, and the two walls of the spindle shaped body are both made of foraminated iron sheet, and the spacing between said two walls is filled with deadening material.

At the end of the spindle shaped bored body there are fixed a number of centering blades which serve also as guide blades for the gas which flows through the annular duct defined by the spindle shaped body and the inner wall of the outer casing.

For removing the central or spindle shaped body, in order to carry out a periodical maintenance of the muffler, one of the bottoms of the outer casing is also removable.

Due to the particular embodiment of the muffler, the exhaust gases coming from the engine through the inlet duct, are guided through the muffler along two ducts, the first of which is formed between the inner wall of the outer casing, and the outer wall of the central spindle-shaped body, while the second duct consists of the cylindrical axial bore which may have either a smooth or a corrugated longitudinal section which forms the inner wall of the central body.

Thus, while the roominess of the two ducts thus created promotes the outflow of the gases, the same gases, in their movement through the ducts will be exposed to a wide surface of deadening walls reducing thus to a very remarkable extent the noise of the exhaust gases.

The device is highly effective due to a number of reasons among which are to be particularly pointed out: the possibility of cleaning periodically the inner walls of the device, the roominess of the exhaust passage for the gases, which originates a minor exhaust back pressure

2

producing an optimum efficiency of the engine due to the almost entire emptying of the residues of the burned gas from the cylinders. It is also important to note, in this connection, that through the two co-axial ducts of the device, the gases have different outflow speeds, so that two streams are originated, and one of said streams acts as an ejector with respect to the other stream.

Finally, the device presents also a wide deadening surface contacted by the gas and therefore generally an optimum sound-proofing efficiency.

As aforesaid, it is a feature of this device that by originating no back pressure inside the device, and therefore, in particular mountings, for instance on the exhaust pipes of motor vehicles, it will be possible to assemble two or more elements in series arrangement.

A preferred embodiment of this invention will be described, with reference to the single drawing, showing an axial cross-section of the device.

The device comprises a cylindrical shaped outer casing 1, consisting of two cylindrical shaped walls 2 and 3, of which the outer one 2 is continuous, while the inner one 3 is foraminated. The body 1 is closed, at one of its ends, by a bottom 4, and also this double walled bottom comprises a continuous outer wall and a foraminated inner wall. The bottom is fixedly mounted and is provided at its center with the pipe fitting 5 for the inflow pipe of the gases (not shown in the figure).

At the other end of the body 1, said body is provided with removable bottom 6, which also has an outer continuous wall 7 and an inner foraminated wall 8, said removable bottom 6 being fastened to the cylindrical body 1 by the fixing strap 9 which is easily removable and is embodied according to conventional techniques. The bottom 6 is provided with the pipe fitting 10 for the exhaust pipe or for another device similar to that here described and not shown in the figure.

The wall 3, forming the inner wall of the body 1, is foraminated throughout its surface and in the spacing between the walls 2 and 3, as well as in the spacings between the foraminated walls and the continuous walls of the bottoms 4 and 6, is located the deadening material, consisting for instance of long fiber glass wool, or any other suitable material.

Within the cylindrical chamber defined by the foraminated wall 3 is located the central body 12 which is made entirely of foraminated metal sheet and consists of an outer wall 13 having a spindle shape, and a cylindrical inner wall 14, also foraminated throughout its extent.

Also in this case the spacing between the two walls 13 and 14 is filled with deadening material 15. The spindle shaped body 12 is provided at its ends with the blades 16, 16', the ends of which bear against the inner wall 3 of the body 1 so as to fix the position of the body 12 when it is entirely introduced into the body 1, and the bottom 6 is fastened at its place. The blades 16 and 16' form guide elements for the gases which enter through the pipe fitting 5 and will be subdivided partially towards the duct 17 outside of the body 12 and inside the wall 3, and partially into the duct 18 forming the axial bore of the body 12.

The unit is completed by technical details, for instance the guide and abutment blades 19 to exactly define the position of the spindle shaped body 12 inside the outer body 1.

Also it has been pointed out that due to the feature of a wide passage area for the gas, as presented by the ducts 17 and 18, it will be possible to arrange more devices in a series arrangement. In this connection it is to be noted that, at will, the devices can be embodied with different outer diameters, for instance by rendering greater the thickness of the spacing formed by the outer

3

casing so that the inner cylindrical room will maintain the same value of its diameter, to allow the use in various serially arranged devices, of inner spindle shaped bodies all equal to one another and therefore interchangeable with each other.

The present invention has been described and shown in one preferred embodiment, it being however understood that constructive changes might be adopted without departing from the scope of the present invention.

I claim:

A muffler for silencing the exhaust noise of internal combustion engines comprising a cylindrical double walled outer casing having a continuous outer wall and a foraminated inner wall, forming an interstice therebetween, an inner foraminated pipe arranged centrally in said outer casing, an outer foraminated shell arranged around said inner pipe and tapering towards the ends thereof to form a spindle-shaped interstice, a first double walled closure rigidly secured to one end of said outer casing and having an inner foraminated wall and an outer continuous wall forming an interstice therebetween and a central inlet aperture in alignment with said inner pipe, a removable fastening means, a second double walled closure removably secured to the other end of said outer casing by said fastening means, a deadening material provided in all said interstices, a plurality of blades provided at the ends of the inner pipe, said blades bearing with their ends against the inner wall of the casing for steadily fixing the

4

position of the inner pipe within said casing to form thus guide elements for combustion gases entering through the inlet aperture, whereby the combustion gases will be convoyed partially towards the interstice between said outer shell and said inner wall of the casing and partially into said inner pipe.

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