

May 27, 1941.

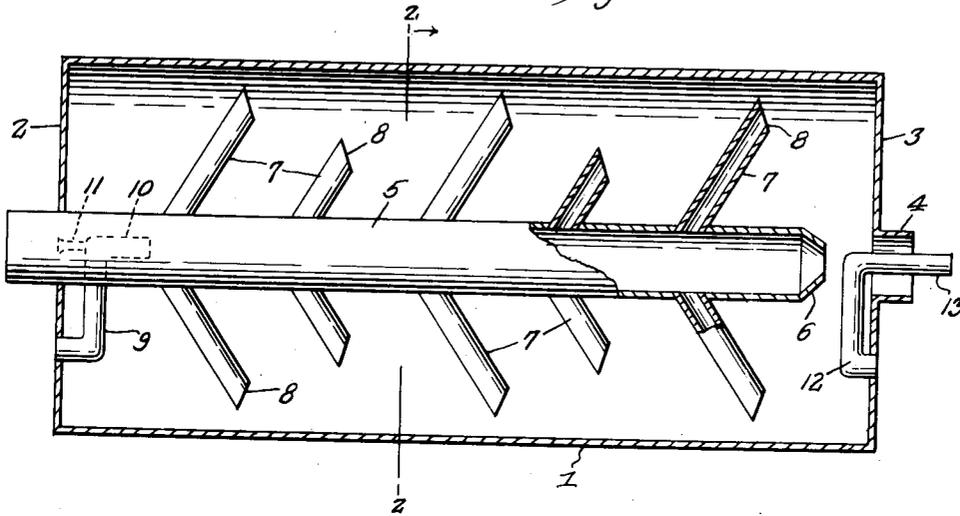
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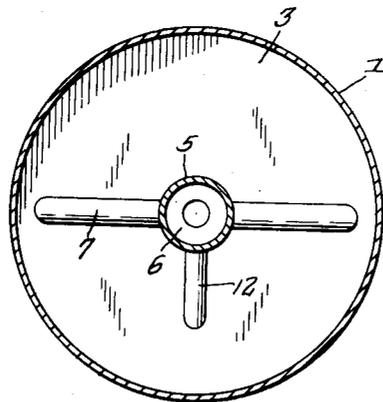
MUFFLER

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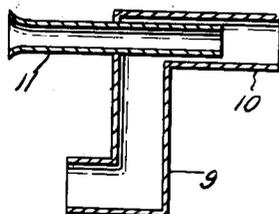
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



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# UNITED STATES PATENT OFFICE

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## MUFFLER

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1 Claim. (Cl. 181-43)

The present invention relates to new and useful improvements in mufflers for internal combustion engines and has for one of its important objects to provide, in a manner as hereinafter set forth, a device of this character comprising a novel construction and arrangement whereby the exhaust of the engine will be silenced while creating substantially no back pressure on said engine.

Another very important object of the invention is to provide a muffler of the aforementioned character which is adapted to dissipate carbon monoxide and other gases.

Other objects of the invention are to provide an internal combustion engine muffler which will be comparatively simple in construction, strong, durable, highly efficient and reliable in use, compact, and which may be manufactured at low cost.

All of the foregoing and still further objects and advantages of the invention will become apparent from a study of the following specification, taken in connection with the accompanying drawing wherein like characters of reference designate corresponding parts throughout the several views, and wherein:

Figure 1 is a view in vertical longitudinal section through a muffler constructed in accordance with the present invention.

Figure 2 is a cross sectional view, taken substantially on the line 2-2 of Fig. 1.

Figure 3 is a detail view in longitudinal section through the air intake means in the forward portion of the muffler.

Referring now to the drawing in detail, it will be seen that the embodiment of the invention which has been illustrated comprises a cylinder 1 of suitable length and diameter. The cylinder 1 is closed by front and rear end walls 2 and 3. The rear end wall 3 of the cylinder 1 is provided with an outlet neck 4 for connecting a tail pipe (not shown) to said cylinder.

Extending longitudinally into the cylinder 1 through the front end 2 thereof is a centrally located pipe 5 for connection, at its forward end, with the usual exhaust pipe from the engine. The pipe 5 terminates in a reduced rear end portion or nozzle 6 which is spaced from the outlet 4. Projecting from the pipe 5 at spaced points are rearwardly inclined expansion branches 7. The branches 7 terminate in rearwardly facing beveled free ends 8.

Mounted in the front portion of the casing 1 is an angular air intake tube 9. One end of the tube 9 communicates with the atmosphere through the front end wall 2 of the casing 1. The tube 9 extends into the pipe 5 and terminates in a rearwardly directed discharge end portion 10. Extending longitudinally into the portion 10 of the tube 9 is a Venturi tube 11.

Mounted in the rear end portion of the casing 1 is another angular air intake tube 12. The tube 12 communicates at one end with the atmosphere through the rear end wall 3 of the casing 1. The tube 12 further comprises a discharge end portion 13 which projects longitudinally through the outlet 4 of the casing 1.

It is thought that the operation of the muffler will be readily apparent from a consideration of the foregoing. Briefly, the exhaust gases pass rearwardly through the pipe 5 and expand in the branches 7, the expanded gases entering the casing 1. By gradually expanding the gases in this manner, noise is substantially reduced. Air from the atmosphere enters the pipe 5 through the tube 9 for mixing with and breaking up the exhaust gases. A portion of the exhaust gases passes through the tube 11 in a manner to create a suction in the tube 9 for increasing the inflow of air from the atmosphere. Additional air from the atmosphere is drawn through the tube 12 by the exhaust gases flowing rearwardly through the outlet neck 4 and the aforementioned tail pipe (not shown) and mixes with and further dilutes said exhaust gases after they leave the casing 1. The construction and arrangement is such that the exhaust gases are thoroughly cooled, diluted, broken up and kept moving rearwardly in the muffler.

It is believed that the many advantages of a muffler constructed in accordance with the present invention will be readily understood and although a preferred embodiment of the device is as illustrated and described, it is to be understood that changes in the details of construction and in the combination and arrangement of parts may be resorted to which will fall within the scope of the invention, as claimed.

What is claimed is:

A muffler for internal combustion engines comprising a casing including front and rear end walls, said rear end wall having an outlet therein, a pipe, for receiving exhaust gases from an engine, extending longitudinally into the casing through the front end wall thereof and terminating in spaced relation to the outlet, a plurality of exhaust gas expansion branches projecting from said pipe in the casing, an air intake tube mounted in the forward portion of the casing and communicating, at its inlet end, with the atmosphere through the front end wall of said casing, said tube including a discharge end portion extending longitudinally in the pipe, and a Venturi tube extending longitudinally in the said discharge end portion of the first named tube, the forward end of said Venturi tube communicating with the pipe for receiving exhaust gases therefrom.

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