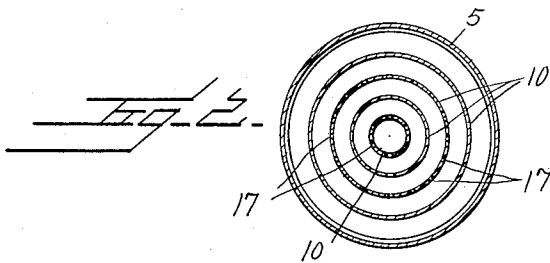
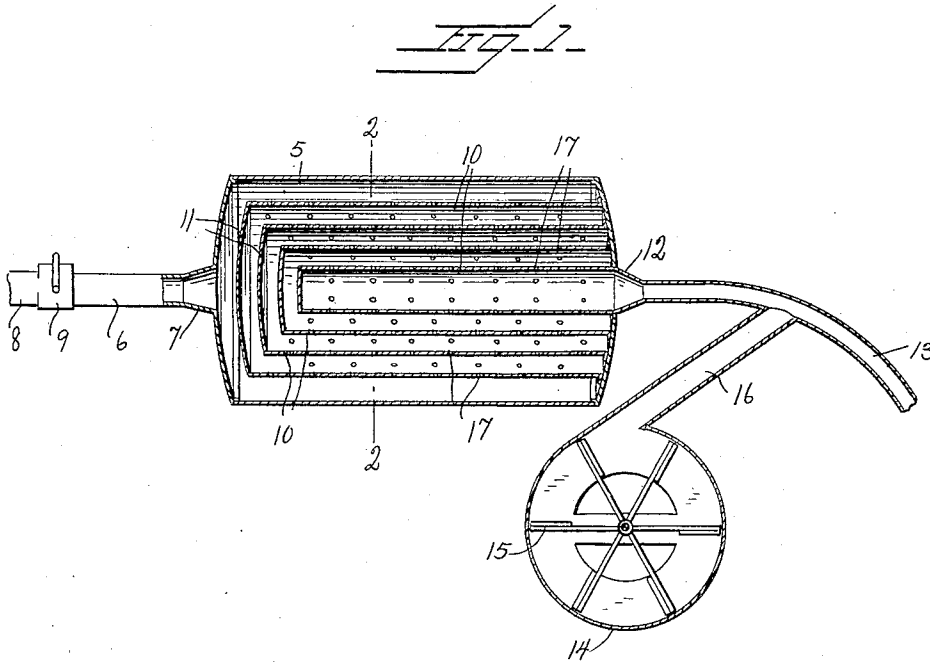


S. P. FABER.
EXHAUST MUFFLER.
APPLICATION FILED AUG. 19, 1918.

1,292,283.

Patented Jan. 21, 1919.



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EXHAUST-MUFFLER.

1,292,283.

Specification of Letters Patent.

Patented Jan. 21, 1919.

Application filed August 19, 1918. Serial No. 250,619.

To all whom it may concern:

Be it known that I, STEVE PETER FABER, a citizen of the United States, residing at Orange City, in the county of Sioux and State of Iowa, have invented certain new and useful Improvements in Exhaust-Mufflers, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to an improved exhaust muffler, and has for its primary object to provide a simple and highly effective device for muffling or silencing the exhaust of internal combustion engines such as are commonly used for the propulsion of motor vehicles.

It is another important object of the invention to provide means in combination with the muffler at the outlet end thereof to accelerate the passage or flow of the exhaust gases through the muffler.

It is also a further general object of my invention to provide a muffler construction wherein the several parts are exceedingly strong in their construction and not liable to get out of order, and light in weight, while the muffler as a whole may be constructed at relatively small cost.

With the above and other objects in view, the invention consists in the improved combination, construction and relative arrangement of the several parts as will be hereinafter more fully described, subsequently claimed and illustrated in the accompanying drawing in which similar reference characters designate corresponding parts throughout the several views, and wherein:

Figure 1 is a longitudinal section through an exhaust muffler illustrating one embodiment of my invention; and

Fig. 2 is a section taken on the line 2—2 of Fig. 1.

Referring in detail to the drawing, 5 designates the outer casing or shell of the muffler, which is preferably constructed of sheet metal. This shell is provided at one of its ends with an axially extending tube 6, said tube having a flaring or enlarged end 7 connected to the end wall of the shell. The other end of this tube is coupled to the exhaust pipe 8 of the engine manifold and is equipped with the usual cut out valve 9. Within the shell 5, a plurality of cylinders 10 are concentrically arranged in spaced relation to each other. The ends of these

cylinders which are opposed to the inlet connection 6, are closed by the walls 11. The opposite end of each cylinder is secured to the opposed end wall of the shell 5. The inner cylinder 10 is engaged through a central opening in said end wall of the shell, and beyond the wall exteriorly of the shell 5, said cylinder is contracted in diameter, as at 12, and extended to provide an outlet pipe 13 through which the exhaust gases are discharged to the atmosphere.

14 designates a suitable fan case within which a multi-bladed fan 15 is rotatably mounted. The outlet neck 16 of the fan casing is connected to the discharge pipe or tube 13 at a point adjacent the reduced portion 12 of the cylinder 11 and in spaced relation thereto. The fan is driven by means of a suitable driving belt, chain, or other operating connection from the engine or motor.

The annular body walls of the several cylinders 10 are perforated, as indicated at 17, so that the exhaust gases entering the shell or casing 5 may pass through the openings or perforations in the cylinder walls until they finally enter the inner cylinder 10.

From the foregoing description, taken in connection with the accompanying drawing, the construction and manner of operation of the device will be clearly understood. In the operation of the engine, the exhaust gases from the engine cylinders enter through the pipe or tube 6 into the end of the muffler shell 5 where they strike the end wall 11 of the outermost cylinder 10. These walls 11 are preferably curved and serve to direct the exhaust gases into the space between the spaced cylinder walls so that it will travel longitudinally toward the opposite end of the shell 5. The walls of the cylinders 10 serve as baffles, the perforations 17 in the adjacent cylinder walls being disposed in staggered relation. The velocity of the exhaust gases as they successively pass from one annular chamber to the other is thus retarded or checked so that by the time these gases enter the inner cylinder 10, the initial pressure of the exhaust has been almost entirely overcome. Accordingly, I provide the fan 15 for the purpose of accelerating the outflow of the gases from the inner cylinder 10 and through the discharge pipe or tube 13. The air from the fan casing enters the tube 13 in an angular direction and toward the outlet end thereof so

that a vacuum is created behind this point of air inlet and between the fan case connection and the end of the muffler. Thus, the exhaust gases will be positively drawn 5 from the inner cylinder 10 and expelled through the tube 13 to the atmosphere.

My improved muffler, as above described, while of very simple construction, is at the same time efficient and reliable in practical 10 operation. The arrangement of the concentric cylinders within the muffler shell serves to effectually reduce the velocity of the exhaust gases and eliminate noise which would otherwise be incident to the discharge of 15 these gases to the atmosphere. At the same time, the possibility of back pressure through the exhaust manifold is obviated by the provision of the expelling fan for the exhaust gases. It is, of course, apparent 20 that the muffler may be made in any desired diameter and length and a greater or less number of the spaced concentric perforated cylinders may be provided than as herein indicated. The several other parts of the 25 device are likewise susceptible of many minor modifications and it is, accordingly, to be understood that I reserve the privilege of adopting all such legitimate changes as may be fairly embodied within the spirit and 30 scope of the invention as claimed.

The entire device will preferably be constructed of aluminum and is primarily designed for use in connection with aviation engines, such as are generally employed upon 35 army aeroplanes. As the improved muffler will practically eliminate all noise from the engine exhaust, the aviator may operate over enemy territory with less likelihood of detection. If desired, I may provide suitable spacing means between the several perforated cylinders of the muffler adjacent to 40 their closed ends.

I claim:—

1. A muffler comprising an outer imperforate shell having an inlet at one end for 45 the exhaust gas, a plurality of concentrically disposed cylinders arranged within said shell, said cylinders having imperforate walls at one of their ends also spaced from each other, the opposite ends of the cylinders being fixed to the other end wall of the 50 shell, the annular body wall of each cylinder being perforated and the inner cylinder extending through the latter end wall of the shell and formed with a pipe extension 55 through which the gases are exhausted to the atmosphere.

2. A muffler comprising an outer imperforate shell having an inlet at one end for the exhaust gas, a plurality of concentrically 60 disposed cylinders arranged within said shell, said cylinders having walls at one of their ends also spaced from each other, the opposite ends of the cylinders being fixed to the other end wall of the shell, the annular body 65 wall of each cylinder being perforated and the inner cylinder extending through the latter end wall of the shell and formed with a pipe extension through which the gases are exhausted to the atmosphere, and a fan hav- 70 ing a casing extension connected to the outlet pipe of the inner cylinder at a point in spaced relation to said shell to direct an air blast into said pipe and toward the outlet 75 thereof, whereby an induced suction is created in the inner cylinder to positively expel the exhaust gases therefrom to the atmosphere.

In testimony whereof I hereunto affix my signature in the presence of two witnesses. 80

STEVE PETER FABER.

Witnesses:

JOHN POPPEMA, Jr.,

EDWARD TE GROOTENHUIS.