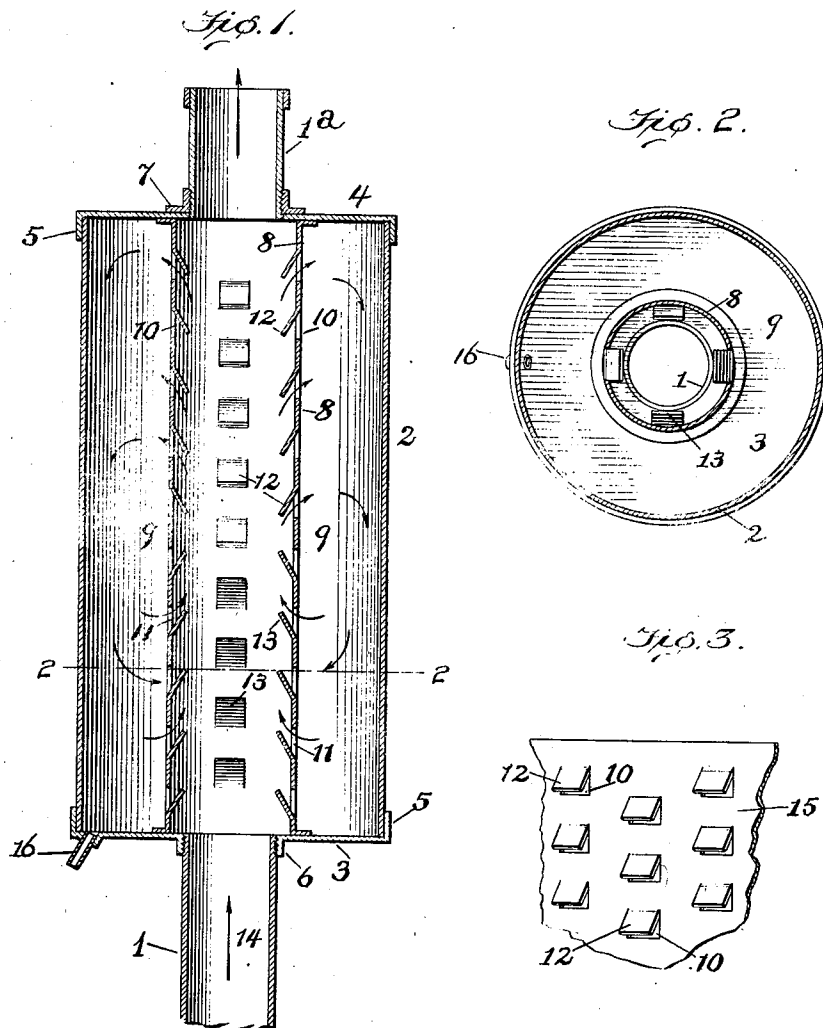


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 NOISE MUFFLER FOR EXHAUST PIPES.
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984,890.

Patented Feb. 21, 1911.



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UNITED STATES PATENT OFFICE.

DANIEL W. DUDDERAR, OF MOUNT AIRY, MARYLAND.

NOISE-MUFFLER FOR EXHAUST-PIPES.

984,890.

Specification of Letters Patent. Patented Feb. 21, 1911.

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To all whom it may concern:

Be it known that I, DANIEL W. DUDDERAR, a citizen of the United States, residing at Mount Airy, in the county of Carroll and State of Maryland, have invented certain new and useful Improvements in Noise-Mufflers for Exhaust-Pipes, of which the following is a specification.

This invention relates to a device for muffling the noise of exhaust pipes.

The object of the invention is to provide means whereby some portion of the exhaust gases of an internal combustion engine may flow through a passage direct to the atmosphere, and other portions of the gases be first diverted into a chamber and after expanding in said chamber return to said direct passage where such expanded gases will serve as an elastic hindrance to retard the escape of other unexpanded gases. Thus some of the exhaust gas itself is used as an elastic or yielding baffle.

Referring to the annexed drawing—Figure 1 is a vertical longitudinal section of the noise muffler on the line 1—1 of Fig. 2. Fig. 2 is a cross-section on the line 2—2 looking downward. Fig. 3 is a view of a broken portion of the deflecting tube spread into a flat form.

The size of the exhaust tube relative to the size of the muffler shell is indicated in the drawing; the exhaust tube, 1, leading from the engine may be of any preferred size, say three inches. The outside shell, 2, of the muffler chamber is cylindric; this shell has a bottom head, 3, and a top head, 4; each head may have a circumferential flange, 5, by which it is secured to the cylindric shell, 2, and may be fastened in any approved manner. The exhaust tube, 1, may be attached to the bottom head, 3, by means of a flange, 6, or any other preferred construction. The terminal or discharge end, 1^a, of the exhaust tube may be attached to the top head, 4, by a collar, 7, or other preferred construction.

It will be seen that the exhaust tubes, 1, and, 1^a, do not of themselves constitute a continuous passage through the muffler shell, 2.

The muffler shell, 2, contains a deflecting tube, 8, extending lengthwise of the shell and secured in concentric position therein; the diametric size of the deflecting tube, 8, is greater than that of the exhaust tube, 1, and

the lowermost end of said deflecting tube where it is secured to the bottom head, 3, surrounds the opening therein where the said exhaust tube is attached.

The deflecting tube, 8, forms inside of the shell, 2, a central mixing and baffling chamber, and also forms a space around said central chamber which space constitutes an expanding chamber, 9. The said deflecting tube, 8, is cylindric and is provided with two series of holes or ports, 10, 11; and two series of inward-projecting diverter tongues, 12, 13. The series of holes, 10, and inclined tongues, 12, are formed in the upper part of the cylindric tube, 8, and these tongues all point in the direction opposite that in which the exhausting gases are moving to escape to the atmosphere as indicated by the darts, 14. An inclined tongue, 12, is over each hole, 10. The other series of holes, 11, and tongues, 13, are in the lower part of the tube, 8, but the lower tongues, 13, are inclined reversely with respect to the upper tongues, 12; the ends of these lower tongues all point in the same direction in which the exhaust gases are moving. Although all of the tongues project inwardly within the tube, 8, yet there is left a clear straight passage directly through the center of the tube, which clear passage has the same diameter as the exhaust tube, 1, and, 1^a.

The wall of the tube, 8, may have as many rows of holes and inclined tongues as the designer may prefer. In Figs. 1 and 2 four rows are indicated; but in Fig. 3, the broken and flattened portion, 15, is intended to show just one half of the cylindric tube and has three rows of holes and tongues. It will be observed in Fig. 3 that the holes, 10, in one vertical row are placed opposite the spaces which are between the holes in the next adjoining rows. While such an arrangement or disposition of holes is deemed a good one, it is obvious other arrangement of holes may be made that will be effective.

The bottom head, 3, of the muffler shell may have a drain tube, 16, to open from the lower part to carry off the water of condensation.

The operation of this noise muffler is as follows,—the exhaust gases coming from the engine will flow with a rush through the pipe or tube, 1, and enter the deflecting tube, 8, passing by the lower tongues, 13,

which point in the same direction in which the gases are moving; some portion of these exhaust gases will be diverted laterally by the upper tongues, 12, which point in the direction opposite that in which the gases are moving—the diverted gases pass from the tube, 8, through the upper holes, 10, into the chamber, 9, and expand therein and then the expanded gases in said chamber turn downward and will pass from the lower part of said chamber through the lower holes, 11, back to the tube, 8; these expanded gases serve as an elastic baffle when they meet other unexpanded gases coming through the tube, 1, and the latter gases will be hindered or retarded thereby. As some portion of the gases is always free to escape to the atmosphere at the discharge tube, 1, the operation of escaping is continuous and not by puffs. This particular operation is effective and has not heretofore to my knowledge been employed.

The operation herein described of employing within the tube, 8, some of the expanded gases to serve as an elastic baffle to retard the escape of other exhaust gases, may be produced in practical degree without having the inclined tongues, 12, and, 13, mere holes, 10, and, 11, being operative.

Having thus described my invention what I claim and desire to secure by Letters Patent is,—

1. A noise-muffler for exhaust-pipes having in combination a shell provided with a bottom and top head and an outlet in the top; a deflecting tube inside of the shell and extending lengthwise thereof and forming within the shell and around the tube an expanding chamber, and the lower end of said tube surrounding the central inlet-opening and being diametrically larger than said opening, and said tube provided with two series of ports, 10, 11, and two series of

tongues, 12, 13, which incline inwardly—one tongue being over each port—the series of tongues in the upper part of the said tube pointing in the direction of the said inlet-opening, and the series of tongues in the lower part pointing reversely with respect to the tongues in the upper part, all of said tongues leaving a clear, direct passage through said tube, and an exhaust pipe attached to the said bottom head around said inlet-opening.

2. A noise-muffler for exhaust pipes having in combination a shell provided at one end with a head having a central inlet-opening to receive the exhaust gases from an engine and at its other end with a head having an outlet to the atmosphere; a tube inside of said shell and having one end communicating with the said inlet-opening and its opposite end communicating with said outlet to the atmosphere and forming around the tube and within the said shell an expanding chamber,—said tube provided with numerous holes communicating with said expanding chamber; and an exhaust pipe communicating directly with said inlet-opening, whereby some portion of the unexpanded gases may pass from the inlet-opening through said tube directly to the outlet that opens to the atmosphere, while other portions of the gases will be diverted from the inside tube through the holes therein into the expanding chamber and there expanded and then pass back into the said inside tube where they serve as an elastic baffle to momentarily retard the escape of some portion of the unexpanded gases.

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

DANIEL W. DUDDERAR.

Witnesses:

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