

(No Model.)

R. B. HAIN.
EXHAUST MUFFLER.

No. 546,814.

Patented Sept. 24, 1895.

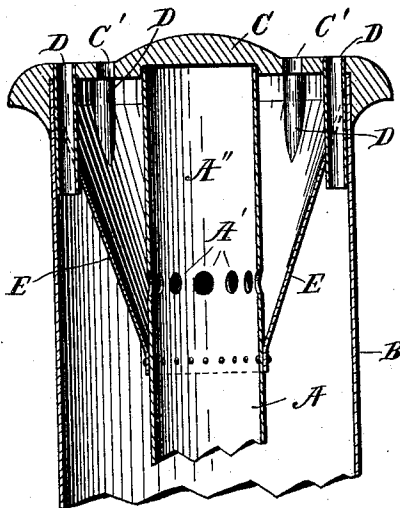


Fig. 1.

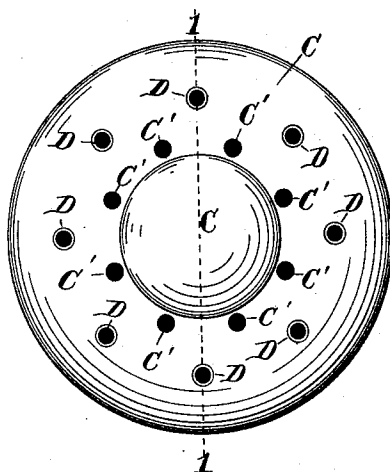


Fig. 2.

Witnesses

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EXHAUST-MUFFLER.

SPECIFICATION forming part of Letters Patent No. 546,814, dated September 24, 1895.

Application filed January 14, 1895. Serial No. 534,789. (No model.)

To all whom it may concern:

Be it known that I, RALPH B. HAIN, a citizen of the United States, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Exhaust-Mufflers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improved muffler for the exhaust of engines; and its object is to provide the same with certain new and useful features hereinafter more fully described, and particularly pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 represents an axial vertical section on the line 1 1 of Fig. 2 of a device embodying my invention, and Fig. 2 a plan view of the same.

Like letters refer to like parts in both of the figures.

A represents the exhaust-pipe, and B an inclosing-jacket of greater diameter, thus leaving a space between said pipe and jacket for the circulation of air to absorb the heat of said exhaust-pipe.

E is a truncated conical diaphragm surrounding the pipe A, having its base closed by the cap C and its smaller end fitting around and attached to the pipe A at a distance from the end of the same.

A' are lateral openings in the pipe A at a distance from its end. A chamber A'' is thus formed in the end of said exhaust-pipe, against the contents of which the exhaust is cushioned at each blast or pulsation.

C is a cap closing the end of the exhaust-pipe and base of the truncated conical diaphragm E and provided with a series of openings C', said exhaust rebounding and escaping laterally through the openings A' into the space within the conical diaphragm E, in which it expands before finally reaching the

series of escape-openings C' in the cap C, through which said exhaust finally escapes in an attenuated and expanded condition and with its pulsations broken up and distributed. Pipes D extend through the cap C and diaphragm E, connecting the space between the pipe and jacket with the open air near the openings C'. Through these pipes the air from said space is drawn by the lateral action of the exhaust, as it escapes from said openings, thus accelerating the circulation of air through said space and consequent cooling of said pipe, which cooling tends to further reduce the exhaust by shrinkage as condensation due to the parting with its heat.

What I claim is—

1. In an exhaust muffler, in combination with an exhaust pipe having a closed chamber at its end lateral openings at a distance from its end, a truncated conical diaphragm surrounding said pipe, and a cap closing said pipe and conical diaphragm, and having exhaust openings, substantially as described.

2. In an exhaust muffler, an exhaust pipe having lateral openings, and a closed chamber between said openings and its ends, an air jacket surrounding said pipe, having means for circulating air therethrough, a truncated conical diaphragm surrounding said pipe, a cap closing the end of said pipe and conical diaphragm, and having exhaust openings, substantially as described.

3. In an exhaust muffler, an exhaust pipe having lateral openings, an air jacket surrounding said pipe, a truncated conical diaphragm between said pipe and jacket, a cap closing said pipe and the base of said conical diaphragm, exhaust openings in said cap, and pipes through said cap and conical diaphragm, substantially as described.

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

RALPH B. HAIN.

Witnesses:

LUTHER V. MOULTON,
LEWIS E. FLANDERS.