O. F. PERSSON.

MUFFLER.

APPLICATION FILED SEPT. 12, 1912.

1,087,397. Patented Feb. 17, 1914.

Fig. 1.

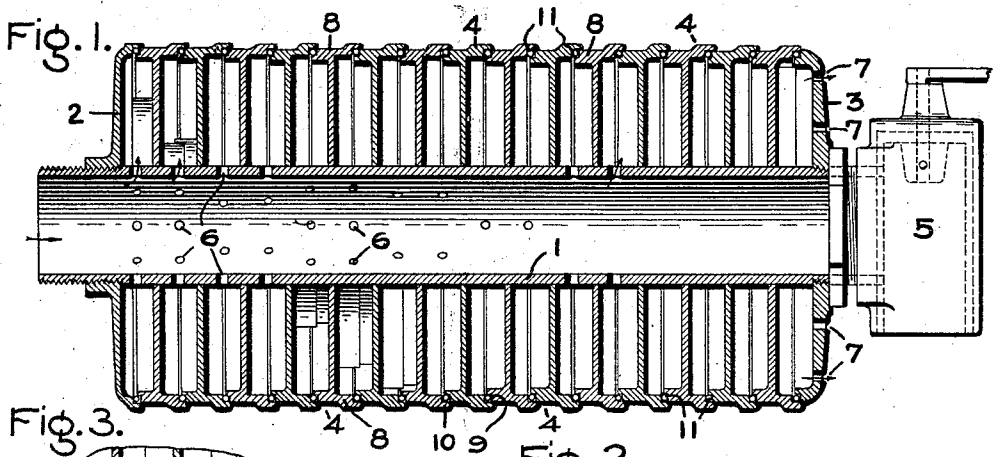


Fig. 3.

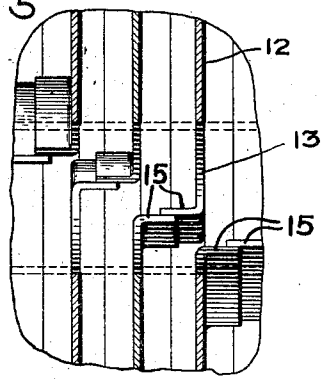


Fig. 2.

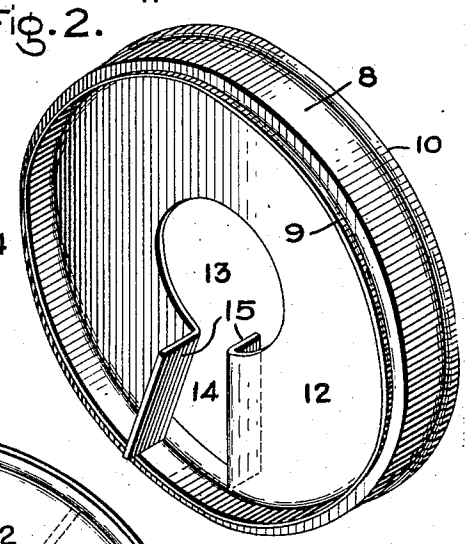
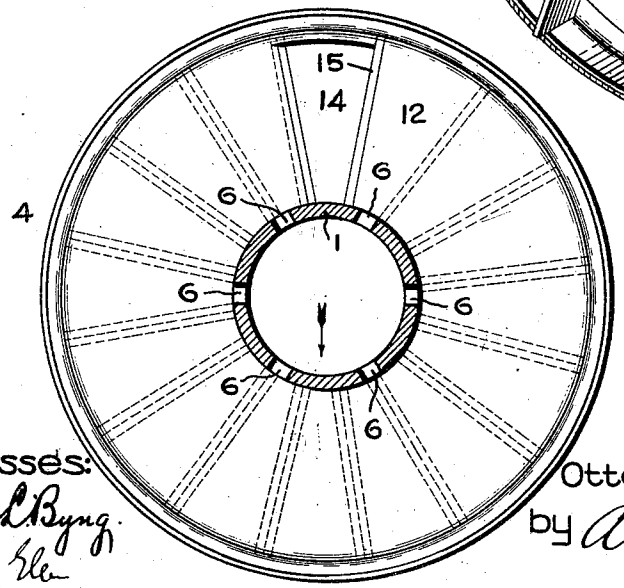


Fig 4.



Witnesses:

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UNITED STATES PATENT OFFICE.

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MUFFLER.

1,087,397. Specification of Letters Patent. Patented Feb. 17, 1914.

Application filed September 12, 1912. Serial No. 719,907.

To all whom it may concern:

Be it known that I, OTTO F. PERSSON, a citizen of the United States, residing at Erie, county of Erie, State of Pennsylvania, have invented certain new and useful Improvements in Mufflers, of which the following is a specification.

This invention relates to devices for deadening the sharp explosive sound of the exhaust from engines driven by expansive fluids, such as steam or gas.

The object of the invention is to simplify the construction of such a muffler, enabling it to be built up to any desired length by assembling a plurality of similar sections. Each section may be a casting of simple construction, and when a number of them are grouped in proper angular relations, a tortuous passage is formed which effectually silences the noise of the expanding gases. The preferred form of section is a short cylinder having a bell at one end to receive the small end of the next section. Midway of the section is a partition having a central hole to fit a length of tubing on which the several sections are grouped. At one point in said partition is a radial opening. Along one edge of said opening is a flange extending a little beyond one end of the section and along the other edge is a similar flange extending a trifle beyond the other end of said section. When the sections are assembled, the flanges of one section slightly overlap those of the adjacent sections, and in this manner a helical passage is formed concentric with the central tube. At suitable points along said tube, holes are provided to admit the exhaust gases from said tube to the tortuous passage through the sections, from which they escape at one end of the muffler.

In the accompanying drawings, Figure 1 is a longitudinal section of my improved muffler. Fig. 2 is an isometric view of one of the sections. Fig. 3 is a detail section on a diametrical line omitting the central tube, and Fig. 4 is a cross section; the last three figures being on a larger scale than Fig. 1.

The muffler comprises a central tube 1, on which are mounted heads 2, 3, between which are clamped the plurality of similar sections 4, which make up the muffler proper. The exhaust gases enter the tube at one end and may be permitted to pass through without muffling by opening the cut-out valve 5 at the other end. Ordinarily, however, the gases find their way through a plurality of holes 6 into some or all of the sections 4, and escape finally to the atmosphere by the openings 7 in the head 3.

Each section 4 is cylindrical, having a short body 8 provided at one end with a rabbet 9 and at the other with a bell 10 to receive the rabbet on the next section. A packing 11 of asbestos wicking or the like is interposed in the joint between adjacent sections. A partition 12 extends across each section, preferably midway thereof, being provided with a central hole 13 to fit the tube 1. The body 8 forms, as it were, a rim about the partition or diaphragm 12. At one side is a radial opening 14 extending preferably from the central hole 13 to the body or rim 8. A radial flange or lip 15 extends along each edge of the opening 14 for its entire length, the two flanges being turned in opposite directions, and their outer edges projecting slightly beyond the ends of the section. The result is that when a number of sections are assembled on the tube 1 and turned until their flanges 15 come in contact, said flanges overlap a little, as shown in Fig. 3. The openings 14 are thus grouped around the tube 1, being angularly displaced in regular order. There is formed by this construction a continuous passage through the muffler, the gases making nearly a complete circle in each section before passing to the next, and proceeding therefore, in a substantially helical fashion around the tube to the last section, from which they escape through the openings in the head 3, without appreciable noise. It will be seen that the length of the path of the gas thus escaping differs greatly between the left-hand and the right-hand ends of the muffler. The portion of the gas leaving the inner tube 1 through the numerous holes at its left-hand end has to travel practically fifteen times around said inner tube; the next portion has to travel fourteen times around the inner tube 1; another portion thirteen times; and so on. Thus while the various portions of gas escape through the holes 6 at about the same time, they are finally discharged through the holes 7 in succession. The result is that the parts into which the sound wave of each exhaust discharge is broken up interfere, and the wave for each

exhaust is flattened out so that the final discharge takes place with a low hissing sound. In this way annoyance from the exhaust is obviated without imposing any substantial amount of back pressure on the engine.

In accordance with the provisions of the patent statutes, I have described the principle of operation of my invention, together with the apparatus which I now consider to represent the best embodiments thereof; but I desire to have it understood that the apparatus shown is only illustrative, and that the invention can be carried out by other means.

What I claim as new and desire to secure by Letters Patent of the United States, is:

1. A muffler composed of a plurality of similar sections fitting together, each of said sections comprising a rim and partition means extending across it and having an opening therein for communication with an adjacent section, and there being means cooperating with the partitions and the rims to form annular passages between adjacent partitions and also means for obstructing adjacent passages on opposite sides of the opening aforesaid in the partition which separates them.

2. A muffler composed of a plurality of similar sections fitting together, each of said sections comprising a rim and partition means extending across it and having an opening therein for communication with an adjacent section, and there being means cooperating with the partitions and the rims to form annular passages between adjacent partitions and also means for obstructing adjacent passages on opposite sides of the openings aforesaid in the partition which separates them, said sections and the openings aforesaid being angularly displaced with reference to one another in regular order.

3. A muffler composed of a plurality of similar sections fitting together, each section having a cylindrical body or rim, a partition extending across it, a radial opening in said partition, and flanges extending in opposite directions from the opposite edges of said opening.

4. A section for a muffler having a short cylindrical body or rim with a rabbet at one end and a bell at the other, a partition extending across said body and having a central hole, a radial opening extending from said hole to said body, and flanges along the opposite edges of said opening turned in opposite directions and projecting slightly beyond the ends of said body.

5. A muffler composed of a central tube provided with holes, and a plurality of similar sections grouped on said tube and fitted together, each section comprising a rim and partition means extending across it and communicating with the next by a radial opening having flanges which cooperate with those on the adjacent sections, so that the gases pass around said tube in each section.

In witness whereof, I have hereunto set my hand this 9th day of September 1912.

OTTO F. PERSSON.

Witnesses:
DORMAN WEAVER,
W. S. CARROLL.