

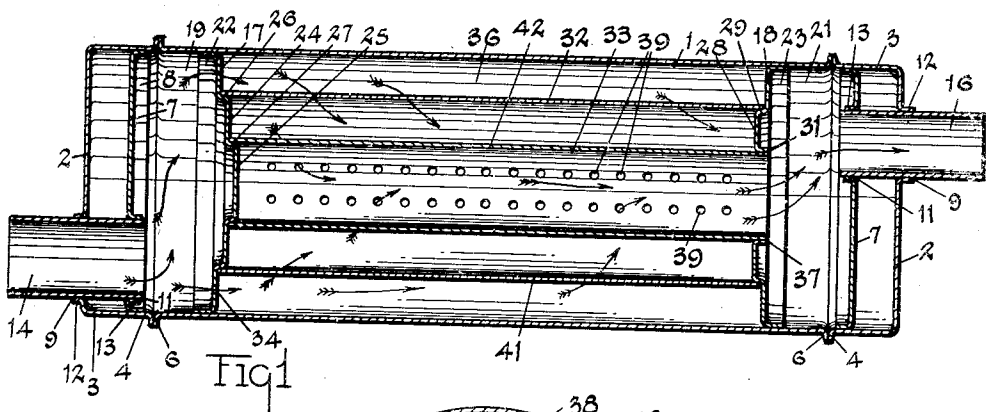
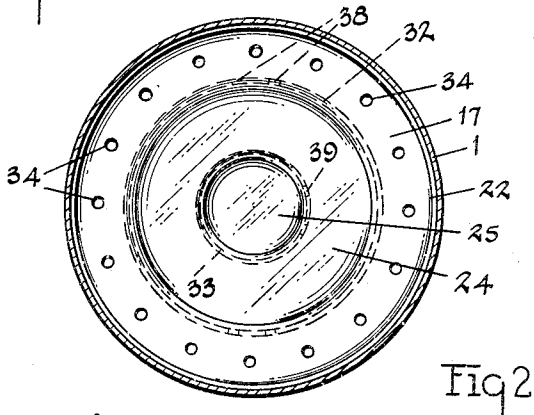
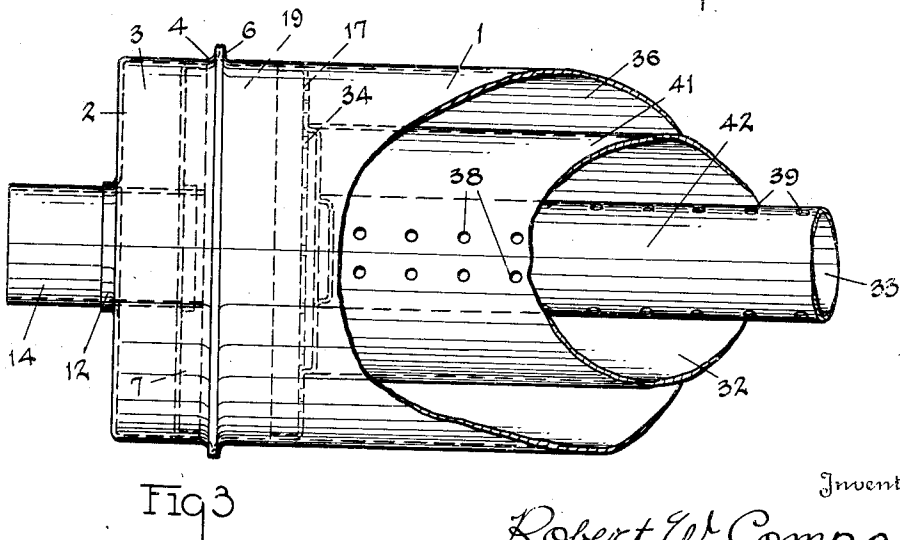
April 12, 1938.

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2,113,828

MUFFLER

Filed May 18, 1936



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UNITED STATES PATENT OFFICE

2,113,828

MUFFLER

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Application May 18, 1936, Serial No. 80,315

1 Claim. (Cl. 181-61)

My invention has for its object to provide a muffler having a plurality of shells located one within the other to permit progressive expansion and distribution of the hot gases, and at the same time to permit progressive lowering of the temperature coincident with the reduction in pressure, to eliminate the pulsatory sound produced by the explosive exhaust of engines. The invention particularly provides means for progressively sub-dividing the exhaust gases by directing the gases through holes of small diameter formed in sheet metal parts to dissipate the expansive force of the gases as they are exhausted, which progressively lessens the rate of flow and an emission of the gases from the outlet pipe of the muffler at substantially a uniform rate.

The invention may be contained in mufflers that vary in their forms of construction, and to illustrate a practical application of the invention, I have selected a muffler containing the invention and shall describe the muffler selected hereinafter. The particular muffler referred to is shown in the accompanying drawing.

Fig. 1 is a view of a longitudinal section of the muffler. Fig. 2 illustrates a transverse section of the muffler shown in Fig. 1. Fig. 3 is a broken view of the muffler to illustrate the arrangement of the openings in the walls of the inner shells of the muffler.

The muffler shown in the drawing comprises an outer casing 1 having a pair of flanged heads 2. The flanges 3 of the heads are flared as at 4 and united with the flared end edges 6 of the casing by welding. The heads 2 are provided with flanged plates 7. The flanges 8 of the plates 7 fit within the inner surfaces of the flanges 3 of the heads 2 and may be, if desired, spot welded or otherwise secured to the flanges 3. The heads 2 and the plates 7 are provided with openings 9 and 11 that are located in alignment, and edge parts of the openings are turned from the planes of the surfaces of the heads 2 and plates 7 to form flanges 12 and 13. The intake pipe 14 and the exhaust pipe 16 fit the interior surfaces of the flanges 12 and 13 and connect the exhaust pipe of the engine and the tail pipe of the muffler with the interior of the muffler.

A pair of partitioning plates 17 and 18 are located in proximity to the heads 2 and form the inlet chamber 19 and the exhaust chamber 21 with which the inlet pipes 14 and the exhaust pipes 16, respectively, communicate. The plates 17 and 18 are provided with the flanges 22 and 23 that fit the interior surface of the casing 1.

The plate 17 is provided with a circular, centrally disposed raised portion 24 and also a central raised portion 25 located within the area of the raised portion 24. These portions are struck up from the sheet metal of which the plate 17 is formed to produce the slightly sloping, conical or substantially cylindrically formed portions 26 and 27. The plate 18 is also provided with a centrally disposed raised portion 28. The raised portion 28 is struck up from the sheet metal of which the plate 18 is formed to produce the slightly sloping, conical or substantially cylindrical surfaces 29 and 31. A pair of shells 32 and 33 are coaxially disposed with reference to the casing 1 and have diameters such that their inner surfaces at one end of each of the shells fit the surfaces 26 and 27 of the plate 17, and the other ends of the shells fit the edge parts or surfaces 29 and 31 of the plate 18. The plate 17 has a plurality of openings 34 located in the marginal region of the plate and connect the inlet chamber 19 with the chamber 36 formed intermediate the outer shell 32 and the wall of the casing 1. The plate 18 is provided with a centrally disposed opening 37 into which one end of the shell 33 extends and communicates with the exhaust chamber 21. The shells may be secured to the surfaces 26, 27, 29, and 31 by spot welding or otherwise to secure them in their relative positions.

Each of the shells 32 and 33 are provided with rows of openings 38 and 39 formed in opposite side portions thereof. The rows of openings of each shell are separated by portions of the shells that are formed solid, that is without openings, such as the portions 41 and 42. The solid portions 41 and 42 are located in radial alignment with respect to the common axis of the shells and the casing with the openings of the other of the shells. Preferably each shell is provided with two relatively closely disposed rows of openings in each of the said side portions. Thus, the exhaust gases that enter the chamber 36 located intermediate the casing and the outer shell 32 are directed over the entire inner surface of the casing 1 and are materially cooled by reason of the fact that the atmospheric air makes contact with the exterior of the drum 1. The rows of holes 38 being located in opposite side portions of the shell 32, the gases which enter through the openings 34 are distributed over the entire space intermediate the casing 1 and the shell 32 and thus the temperature of the gases is greatly reduced by reason of the retention of the gases within the chamber 36 and in contact with the

inner surface of the shell. Eventually the gases escape through the openings 38 of the shell 32 into the chamber formed between the inner and the outer of the shells 32 and 33. The solid portions 5 42 of the shell 33 being located in radial alignment with the openings 38, the gases are further retarded and baffled and thus are caused to fill the chamber formed intermediate the inner and the outer shells, as relatively small portions continue to escape through the openings 39 formed 10 in the side portions of the inner shell 33. The exhaust gases then flow with a relative steady stream through the end of the shell 33 into the exhaust chamber 21 and escape through the exhaust pipe 16 that is connected to the tail pipe 15 of the conveyance or vehicle.

Preferably the openings formed in the plate 17 and the inner and outer shells are relatively small, such as about one-eighth inch in diameter, which 20 causes marked retardation and decrease in the flow of the gases and enables expansion and reduction in temperature, not only by the cooling

area of the inner surface of the drum, but also by reason of the expansion of the gases. This results in a substantially continuous exhaust of the gases of the engine from the muffler. The explosive sound of the repeated exhausts is thus 5 eliminated.

I claim:

In a muffler, a casing having flanged end parts, flanged heads secured to the said end parts of the casing, flanged plate extending across and fitting the flanged parts of the heads, each plate 10 and its associated head having aligned openings, the heads and the plates having flanged parts located at the edges of the openings and inlet and exhaust pipes interfitting the flanged parts about 15 the openings and extending from the exterior into the interior of the muffler, and a baffle means located intermediate the openings for delaying the movement of the exhaust gases from the inlet pipe to the exhaust pipe. 20

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