Oct. 21, 1924. 1,512,859

H. S. POWELL

MUFFLER

Filed July 17, 1919

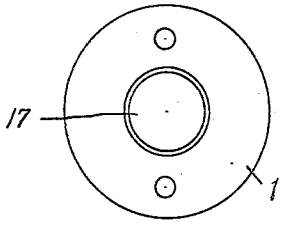


Fig. 3

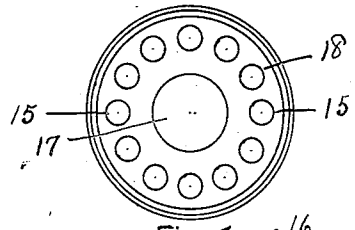


Fig. 4

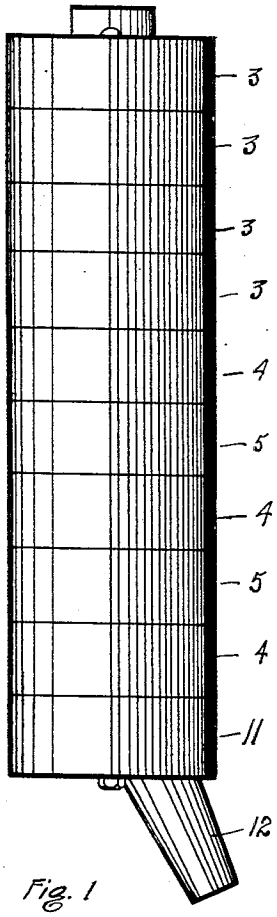


Fig. 1

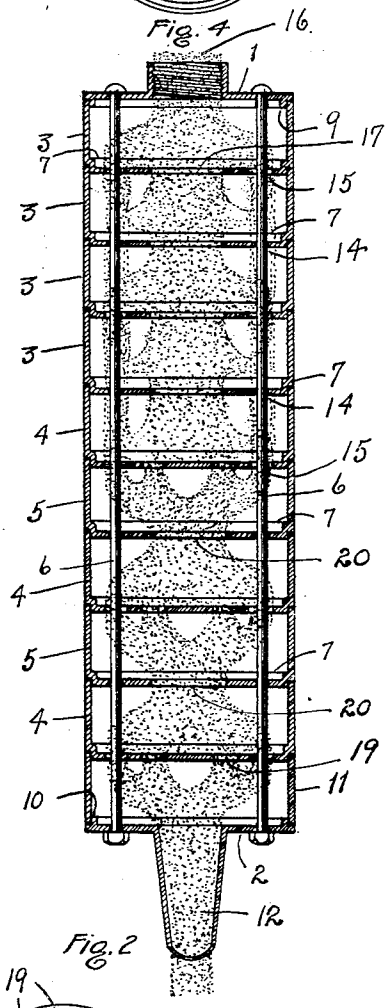


Fig. 2

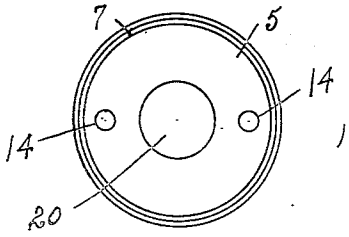


Fig. 5

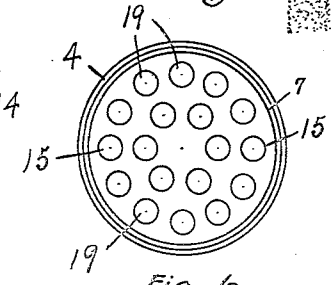


Fig. 6

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UNITED STATES PATENT OFFICE.

HERBERT S. POWELL, OF UTICA, NEW YORK.

MUFFLER.

Application filed July 17, 1919. Serial No. 311,574.

To all whom it may concern:

Be it known that I, HERBERT S. POWELL, a citizen of the United States, residing at Utica, in the county of Oneida and State of New York, have invented certain new and useful Improvements in Mufflers, of which the following is a specification, reference being had therein to the accompanying drawing.

My invention relates to a muffler and I declare the following to be a full, clear, complete and concise description thereof sufficient to enable anyone skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings in which like reference characters refer to like parts throughout the specification.

The object of the invention is to construct a muffler that will be strong, durable and efficient for deadening the sound caused by the exhaust of an explosive engine. To this end the muffler is equipped with a plurality of sections made of cups that have apertures disposed in the bottom plates thereof. These apertures are arranged to compel the exhaust to take a tortuous course through the muffler, whereby to break up the force of said exhaust as it comes from the engine and thereby permit it to escape to the open atmosphere unaccompanied by a terrific sound. Furthermore, the object is to fit the sections in an air tight manner and with a flush outer surface.

The object will be understood by referring to the drawings in which:

Fig. 1 is an elevation of the muffler;

Fig. 2 is a vertical central section of the same;

Fig. 3 is a top plan view of the muffler;

Fig. 4 is a top plan view of one of the cups employed;

Fig. 5 is a top plan view of another cup employed, showing a different arrangement of the aperture in the bottom thereof;

Fig. 6 is a top plan view of still another cup employed, showing a still different arrangement of the apertures in the bottom thereof.

Referring more particularly to the muffler, the top plate is represented by —1—, the bottom plate by 2 and the intermediate cups by 3, 4 and 5. The parts are held together by stay rods 6—6, two usually being sufficient.

The cups 3, 4 and 5 are made of drawn metal and are each provided with an annular shoulder at 7 formed by the indentation of the lower edge thereof. The shoulder 7 so formed provides a seat for the upper edge of the next adjacent cup, whereby the whole will fit together in an air tight manner and make a flush outer surface for the muffler. The cups form a plurality of chambers for the diffusion of the exhaust. The top plate —1— has a depending flange 9 adapted to form a shoulder for assembling the adjacent edge of the first cup 3. Likewise the bottom plate 2 has a flange 10 to form a shoulder for assembling the adjacent edge of the ring 11 that is used to help make the final chamber. The bottom plate 2 has made integral therewith a conduit 12 for the escape of the exhaust to the outer atmosphere.

The top and bottom plates 1 and 2 and each of the cups 3, 4 and 5 have apertures for the projection therethrough of the rods 6. It will be observed, however, that the apertures for the projection of the rods 6 alternate between small and large ones, as 14 and 15. The small apertures 14 are adapted to fit snug around rods 6 to thereby aid in holding the whole series of cups more firmly together, so as to prevent any rattling, whereas the large apertures 15 assist the progress of the gases through the muffler and, moreover, are sufficiently large, so that the cups do not make contact with rods 6. Therefore, the contraction and expansion of cups having apertures 15 will not bend rods 6.

The gases of explosion enter the muffler by way of the opening 16 and progress through the same in a tortuous course which is effected by the arrangement of the apertures in the bottoms of the several cups 3, 4 and 5. Each of the cups 3 is provided in the base thereof with a large central aperture 17 and with small peripheral apertures 18, usually twenty-seven in all, as shown in Fig. 4. Each of the cups 4 has a set of small apertures 19 disposed in concentric circles, as shown in Fig. 6. Each of the cups 5 has a large central aperture 20, as shown in Fig. 5.

The progress of the gases of explosion through the muffler is shown by the dotted lines in Fig. 2, and is uniform through the first four chambers or cups 3, where it passes

through the central apertures 17 and the small peripheral apertures 18, until said gases reach the fifth chamber or cup 4 which has small concentric apertures 19 and no large central aperture as 20, thereby causing the more complete diffusion of the gases throughout its chamber. On reaching the next chamber or cup 5, which has only a large central aperture 20, the gases come together to pass therethrough. The next chamber which is made of another cup 4 has the concentric apertures 19 that again cause the diffusion of the gases. From the last chamber the gases escape to the outer atmosphere through the conduit 11.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

In a muffler, a plurality of sections, annular shoulders made by the indentation of the lower edges of said sections to form seats for the upper edge of the next adjacent section, to form an air tight joint, end members having annular flanges for fitting said sections thereto, large central apertures made in the first four sections to permit the expansion of the gases, small peripheral and large central apertures in others, alternating with small concentric apertures in still others, and said sections so arranged that the large central apertures are uniform for the first four sections to allow for the expansion and for the alternate contraction and expansion through the others, whereby the gases will take a tortuous course, headed stay rods bolted at one end for holding the sections together and said stay rods adapted to project through certain of said peripheral apertures that alternate between close and loose fitting to said stay rods.

In testimony whereof I have affixed my signature.

HERBERT S. POWELL.