Sept. 15, 1931. H. M. GORSLINE 1,822,990

MUFFLER

Filed June 23, 1930

FIG. 1

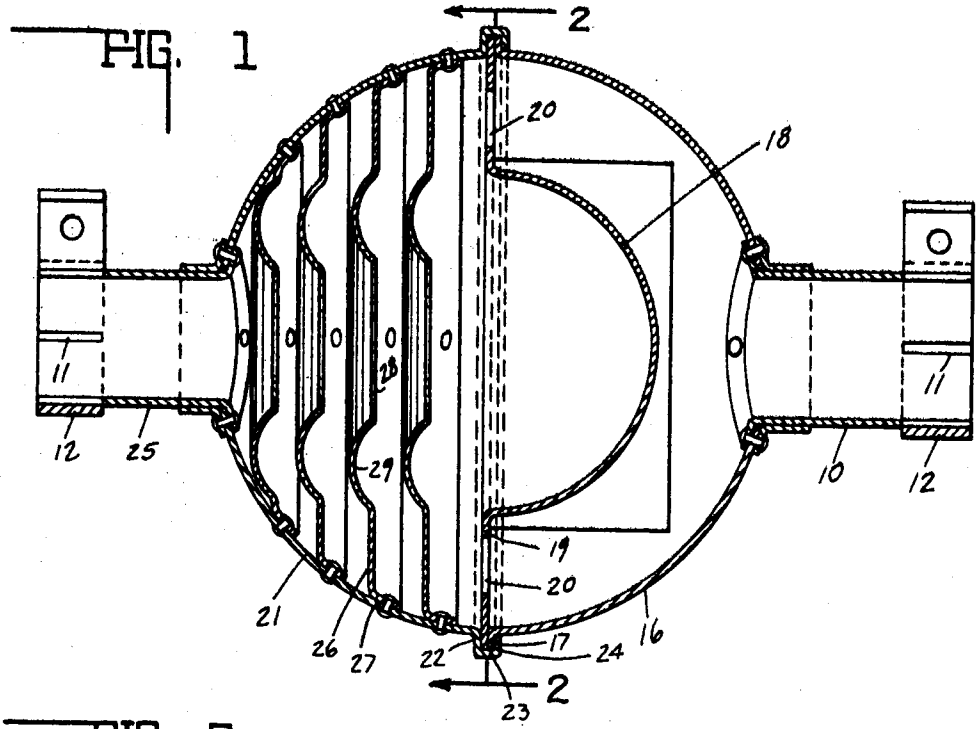


FIG. 2

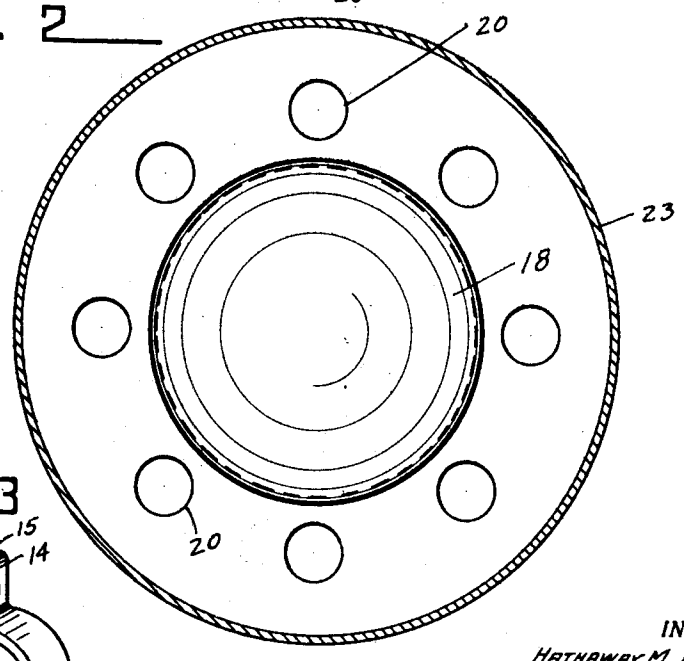
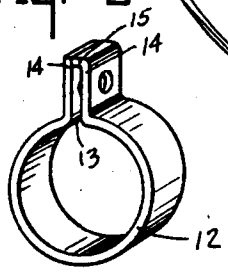


FIG. 3



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MUFFLER

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This invention relates to a muffler construction.

The chief object of this invention is to muffle the sound of explosion by causing the exhaust gases discharged to the exhaust pipe, to pursue a circuitous interrupted path, the arrangement being such that but little back pressure is imposed upon the engine.

The chief feature of the invention consists in interposing in an exhaust system of an internal combustion engine a spherical muffler construction in which the gases are caused to diverge and follow the spherical outline and thence are caused to consolidate and follow an interrupted but axial path for silencing.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims:—

In the drawings Fig. 1 is a longitudinal sectional view through the muffler construction embodying the invention.

Fig. 2 is a transverse sectional view taken on the broken line 2—2 of Fig. 1 and in the direction of the arrows.

Fig. 3 is a perspective view of one of the muffler clamping mounts.

In the drawings 10 indicates an inlet pipe which is parted as at 11 and mounted thereon is a clamping collar 12 having at its split portion 13 a pair of parallel extending leaves 14, one of which is turned inwardly toward the other as at 15. The leaves or ears 14 are drawn together by a suitable bolt and nut construction and thus clampingly mount the split pipe 10 upon the end of the exhaust pipe for muffling the exhaust therefrom.

A hemispherical shell 16 suitably supports at its central portion the tubular inlet 10. The shell terminates in an outwardly directed flange 17. A concentric hemispherical deflector 18 includes a similar flange 19 which is extended and lies adjacent flange 17 as shown. Flange 19 includes a plurality of perforations 20 and the summation of perforations 20 provides an area through the flange 19 or partition, at least equal to and preferably greater than the cross sectional area of the inlet 10, so that there is no back pressure due to reduction in area.

The exhaust gases which pass into the hemispherical shell 16 are caused to diverge around the hemispherical deflector 18 and thus sudden expansion relieves the pressure and inasmuch as the total area of the outlets 20 exceeds that of the passage 10, the gas passes freely from this hemispherical chamber. The other half of the muffler also includes a hemispherical casing 21 which is provided with an outwardly directed flange 22 that lies parallel to flanges 19 and 17. Herein flange 22 is so provided with a laterally directed peripheral portion 23 and an inwardly directed portion 24, whereby the flanges 17, 19 and 22 are all secured together and the muffler is secured together as a unit in spherical form.

The hemispherical shell 21 includes an opening which communicates with a discharge pipe 25 that mounts a similar clamping member for mounting the extended end of the exhaust pipe. Positioned in substantially parallel relation and parallel to partition 19, are a plurality of inwardly directed plates 26, each being secured to the hemispherical shell 21 through the peripheral flange 27. Each plate includes an enlarged central aperture 28 and each plate also includes an annular trough portion 29 immediately adjacent thereto, the peripheral annular trough portion 29 forming a cup like arrangement for trapping angularly directed gases passing the several parallel partitions. The annular cup like portions 29 provide silencing chambers for silencing the exhaust. As shown clearly in Fig. 1, the central openings 28 in a plurality of partitions 26 are of a progressive decreasing area with relation to the direction of gas passage.

The gases which are discharged from pipe 10 engage the hemispherical shell or shield 18 and are diverted outwardly and pass around the same and thence escape from the chamber formed between the two included shells, by way of openings 20 into the other half of the muffler construction. The gases escaping through openings 20 pass rearwardly in the muffler and engage the first partition 26 and thence are deflected outwardly from the annular portion 29 thereof and

forwardly. Part of the gas continues its forward movement until it engages the inner side of the hemispherical shell 18, whereupon it is returned and the gas escapes from this chamber through the opening 28 and thence passes rearwardly. Any lateral dispersion of the gas is trapped in the successive chambers formed between the plates 26 and this type of construction also silences the escape of the exhaust gases. The cross sectional area of the outlet pipe is slightly less than the cross sectional area of the intake 10.

The invention claimed is:—

1. In a muffler construction the combination of a hemispherical shell having at its closed end an axially arranged intake, a hemispherical shell at the other end including an axially arranged discharge, a closure plate positioned adjacent the open end of the first-mentioned shell and including a co-axially arranged imperforate, partially spherical baffling portion extending into said first-mentioned shell and an outwardly directed flange extending to the edge of the open end of said first-mentioned shell and including a plurality of peripherally arranged discharge openings, and a plurality of spaced and centrally apertured annular baffle plates extending across the other shell and with the central apertures in axial alignment.

2. In a muffler construction the combination of a hemispherical shell having at its closed end an axially arranged intake, a hemispherical shell at the other end including an axially arranged discharge, a closure plate positioned adjacent the open end of the first-mentioned shell and including a coaxially arranged imperforate, partially spherical baffling portion extending into said first-mentioned shell and an outwardly directed flange extending to the edge of the open end of said first-mentioned shell and including a plurality of peripherally arranged discharge openings, and a plurality of spaced and centrally apertured annular baffle plates extending across the other shell and with the central apertures in axial alignment, each of said plurality of baffle plates having an annular groove forming portion defining the central aperture therein.

3. In a muffler construction the combination of a hemispherical shell having at its closed end an axially arranged intake, a hemispherical shell at the other end including an axially arranged discharge, a closure plate positioned adjacent the open end of the first-mentioned shell and including a coaxially arranged imperforate, partially spherical baffling portion extending into said first-mentioned shell and an outwardly directed flange extending to the edge of the open end of said first-mentioned shell and including a plurality of peripherally arranged discharge openings, and a plurality of spaced and centrally apertured annular baffle plates extending across the other shell and with the central apertures in axial alignment, the intake being of greater area than the discharge, and each of the central apertures in the plurality of plates being of lesser area than the preceding aperture closest to the intake.

4. In a muffler construction the combination of a hemispherical shell having at its closed end an axially arranged intake, a hemispherical shell at the other end including an axially arranged discharge, a closure plate positioned adjacent the open end of the first-mentioned shell and including a coaxially arranged imperforate, partially spherical baffling portion extending into said first-mentioned shell and an outwardly directed flange extending to the edge of the open end of said first-mentioned shell and including a plurality of peripherally arranged discharge openings, and a plurality of spaced and centrally apertured annular baffle plates extending across the other shell and with the central apertures in axial alignment, each of said plurality of baffle plates having an annular groove forming portion terminating in the central aperture therein, the intake being of greater area than the discharge, and each of the apertures in the plurality of baffle plates being of lesser area than the preceding aperture closest to the intake.

In witness whereof, I have hereunto affixed my signature.

HATHAWAY M. GORSLINE.