

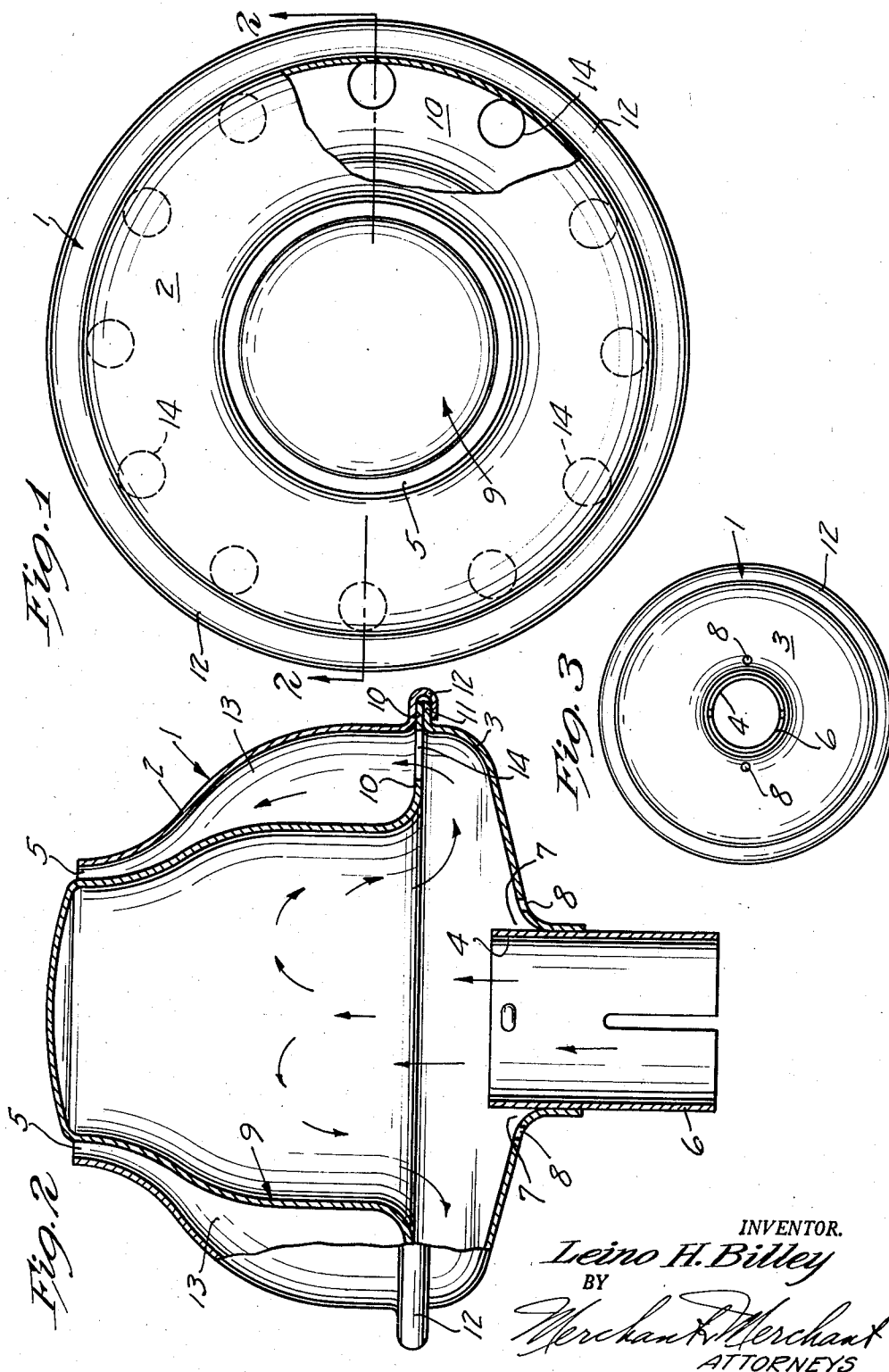
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EXHAUST SILENCER AND RAIN TRAP

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EXHAUST SILENCER AND RAIN TRAP

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1 Claim. (Cl. 181—53)

Generally speaking, my present invention relates to improvements in exhaust silencers or mufflers of the kind employed most commonly in connection with internal combustion engines, air compressors and the like. While the invention is adapted to a wide range of uses, it is nevertheless particularly adapted for use in connection with relatively small internal combustion engines, compressors and the like, to silence the exhaust gases discharged therefrom.

In a still more specific sense, the invention relates to combined exhaust silencers and rain traps for use in connection with internal combustion engines, compressors and the like; the rain trap function thereof being of primary importance when the device is applied in a vertical position.

An important object of the instant invention is the provision of a simple and low-cost, but nevertheless efficient, muffler or silencer for use in connection with internal combustion engines.

Another object of the invention is the provision of a combined muffler and rain trap for internal combustion engine exhaust systems, which is simple in construction, durable and efficient.

The above and other important objects and advantages of the invention will be made apparent or enlarged upon in the accompanying drawings, specification and claim.

In the accompanying drawings, like characters indicate like parts throughout the several views.

Referring to the drawings:

Fig. 1 is a top plan view of a combined muffler and rain trap for the exhaust systems of internal combustion engines, compressors and the like, with some parts broken away and some parts shown in section;

Fig. 2 is an axial sectional view taken on the line 2—2 of Fig. 1, with some parts shown in full; and

Fig. 3 is a bottom plan view of the device of Figs. 1 and 2 on a greatly reduced scale.

The outer shell of the combined rain trap and muffler, indicated as an entirety by 1, shown in the drawings, is a 2-part structure comprising an upper or outer section 2 and a lower or inner section 3. This shell structure 1 is provided in its lower or inner section 3 with an axial inlet opening 4 and in its upper or outer section 2 with an axial final discharge opening 5. The inlet opening 4 is defined by an axially directed split coupling tube 6, which extends snugly through an axial opening in the lower shell section 3 to a plane above the adjacent bottom portion of the shell section 3, and which is rigidly secured to the lower shell section 3 by spot welding or the like. The inner end of the coupling sleeve 6, which may be considered as part of the shell structure,

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defines together with the bottom of the shell section 3, an annular moisture sump 7 surrounding the inlet opening 4. Preferably, and as illustrated herein, one or more highly restricted discharge ports 8 open through the bottom shell section 3 from the moisture sump 7.

Spanning the interior of the shell 1 is a partition structure comprising an inverted cup-like member or portion 9 and an annular anchoring flange portion 10, which latter, as shown, is an integrally outturned part of the cup-like portion 9. The anchoring flange portion 10 overlies an annular anchoring flange 11 of the lower shell section 3 and said flanges 10 and 11 are tightly crimped within a channel-shaped coupling flange 12 of the upper shell section 2.

The inverted cup-like portion 9 is inwardly spaced from the adjacent wall portion or portions of the shell 1 to define therewith an upwardly directed outlet passage 13, the upper end of which opens to atmosphere through the final discharge passage 5 and the lower end of which opens into the space below the anchoring flange portion 10 through a series of circumferentially spaced apertures or holes 14 in said flange 10.

The internal diameter of the coupling sleeve 6 which defines the inlet opening 4 is materially less than the internal diameter of the open end of the cup portion, and the inner end of said coupling sleeve is preferably spaced from the open end of the said cup portion.

The coupling sleeve 6 is of course adapted to be clamped or otherwise rigidly secured to the outer end of an exhaust pipe from an engine, compressor or the like, and when applied in a vertical position will serve very effectively as a rain trap to prevent moisture entering the outlet passage 5 from entering the engine's exhaust pipe through the coupling sleeve 6. In the preferred embodiment of the invention illustrated, the upper section 2 of the outer shell 1 and the adjacent wall portions of the inverted cup-like portion or member 9 both converge toward their outer ends. In fact, the outer shell converges at a greater rate than the adjacent portions of the cup 9 so as to cause a relative convergence of the inner and outer structural walls defining the outlet passage 13 in the direction of flow therethrough. In other words, the passage 13 is progressively restricted in the direction of flow therethrough.

The device illustrated has been thoroughly tested and found to be highly practical as a low-cost muffler and rain trap; and while I have shown and described a preferred embodiment of my novel device, it will be understood that the same is capable of modification without departure from the spirit and scope of the invention, as defined in the claim.

What I claim is:

In a device of the class described, a cup-like member having a closed end and an open end and substantially imperforate sides, an outer shell concentrically disposed around the cup-like member and having an open end adjacent the plane of the closed end of the cup-like member and having a closed end spaced outwardly of the open end of the cup-like member and which has an axially directed central inlet passage therethrough terminating adjacent the open end of the cup-like member, said shell being substantially imperforate intermediate its said inlet and its said open end, means supporting the cup-like member from the shell, the cup-like member

being spaced from the shell to define therewith a generally annular outlet passage surrounding the cup-like member and extending substantially the full length of the latter and further defining a final annular outlet opening closely adjacent the closed end of the cup-like member, adjacent portions of the shell and cup-like member defining the said outlet passage converging relative to one another and the common axis of the shell and cup-like member toward the final discharge opening to gradually and progressively restrict the outlet passage in the direction of flow therethrough.

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