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R. B. BOURNE ET AL

2,660,257

SILENCER WITH LOW BACK PRESSURE

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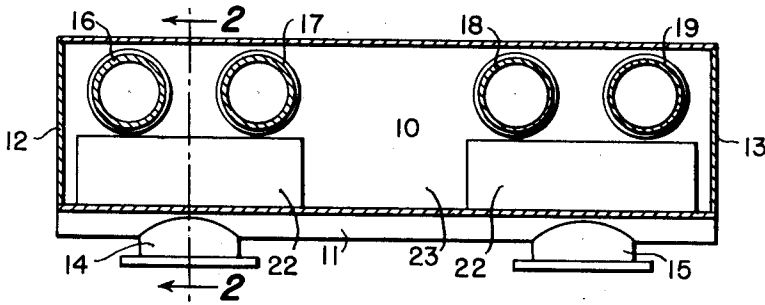


Fig. 1

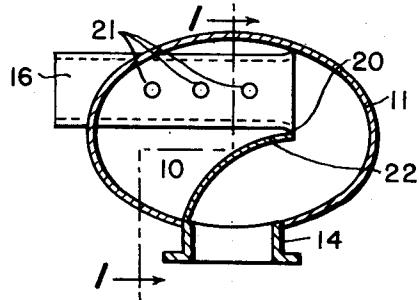


Fig. 2

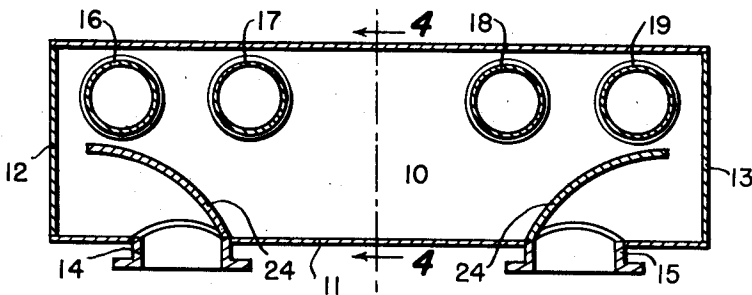


Fig. 3

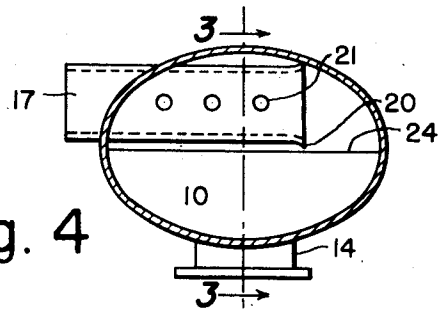


Fig. 4

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SILENCER WITH LOW BACK PRESSURE

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4 Claims. (Cl. 181-49)

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This invention relates to silencers of the type intended for use in compact quarters to silence the exhaust of internal combustion engines having up to several hundred horsepower. In uses such as this the exhaust gas flow is extremely large, and particularly where space is restricted the problem of keeping back pressure down is difficult of solution. The object of the present invention is to provide a silencer which will preserve an acceptable silencing action without raising the back pressure to the point where the operation of the engine is seriously affected.

The invention will now be described with reference to the accompanying drawing, in which

Fig. 1 is a longitudinal section through a silencer constructed in accordance with one form of the invention, taken on line 1-1 of Fig. 2;

Fig. 2 is a section on line 2-2 of Fig. 1;

Fig. 3 is a longitudinal section of a modification, taken on line 3-3 of Fig. 4; and

Fig. 4 is a section on line 4-4 of Fig. 3.

Referring first to the form shown in Figs. 1 and 2, the silencer is formed with a single chamber 10 enclosed by a cylindrical shell 11 preferably of elliptical cross section and end headers 12 and 13. Inlet conduits 14 and 15, generally connected to the two exhaust manifolds of a V-type engine, open into the chamber 10 and terminate substantially flush with the shell. Preferably the inlet conduits are arranged in line with the minor axis of the ellipse. Exhaust conduits 16, 17, 18 and 19 are arranged parallel to the major axis of the ellipse, and as far away from the inlet conduits as is consistent with having the exhaust conduits extend somewhat beyond the center of chamber 10. The open ends of the exhaust conduits are flared at 20 to reduce entrance losses which would increase back pressure, and are provided with anti-resonance holes 21 as described in Bourne Patent 2,297,046, September 29, 1942.

Within the chamber 10 a deflecting plate 22 is secured to the shell as by welding along a line longitudinally of the cylinder and adjacent one side of each inlet conduit opening. The plate is curved over the inlet opening about to the flared ends 20 of the exhaust conduits to direct the gas against the shell wall rather than allowing it to pass straight into the chamber. Preferably the plate is formed with a central gap 23. The modification of Figs. 3 and 4 is similar except for the form of the deflecting plates, and with that exception the same reference characters are retained to avoid unnecessary description. A plate 24 is secured to the shell adjacent each inlet conduit, curving over the conduit opening in a direction towards the end headers 12 and 13 respectively. The plate should end at a distance from the header such that the area of the gap is at least as great as

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the cross-sectional area of the inlet conduit. This is a very rigid construction, since the entire side edge of the plate lies in contact with the shell (Fig. 4) and can be welded to it.

What we claim is:

1. A silencer comprising a cylindrical shell, headers closing the ends of the shell to form a single chamber, at least one open-ended inlet conduit entering the cylindrical shell substantially radially at one side thereof and terminating substantially flush with the shell, at least one open-ended outlet conduit entering the shell in a direction substantially at right angles to the inlet conduit and positioned remote therefrom, and a deflecting plate secured to the inside of the shell along a line substantially tangent to the inlet opening and with its side and top edges spaced from the wall of the shell and from said headers, said deflecting plate being formed on a curve concave towards and extending over the inlet opening.

2. A silencer as claimed in claim 1 in which the plate is positioned longitudinally of the cylindrical shell and curves over the inlet opening towards the cylindrical wall of the shell.

3. A silencer comprising a shell in the form of a cylinder of substantially elliptical cross section, headers closing the ends of the shell to form a single chamber, at least one open-ended inlet conduit entering the shell in the direction of the minor axis of the ellipse and terminating substantially flush with the shell, at least one open-ended outlet conduit entering the shell in a direction parallel to the major axis of the ellipse and remote from the inlet conduit, and a deflecting plate secured to the inside of the shell along a line substantially tangent to the inlet opening and with its side and top edges spaced from the wall of the shell and from said headers, said deflecting plate being formed on a curve concave towards and extending over the inlet opening.

4. A silencer as claimed in claim 3 in which the plate is positioned longitudinally of the cylindrical shell and curves over the inlet opening towards the cylindrical wall of the shell.

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