April 21, 1959 C. R. KILLIAN 2,882,991

JET ENGINE SILENCER

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Fig. 1

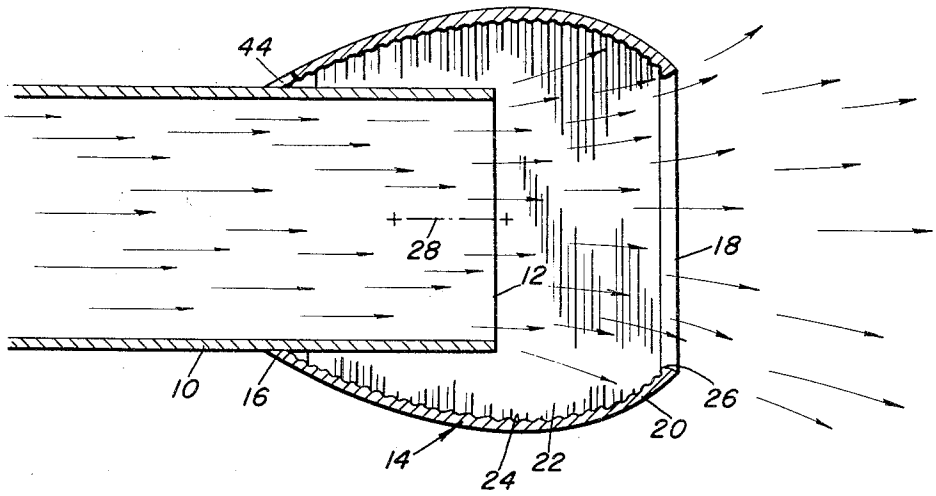


Fig. 2

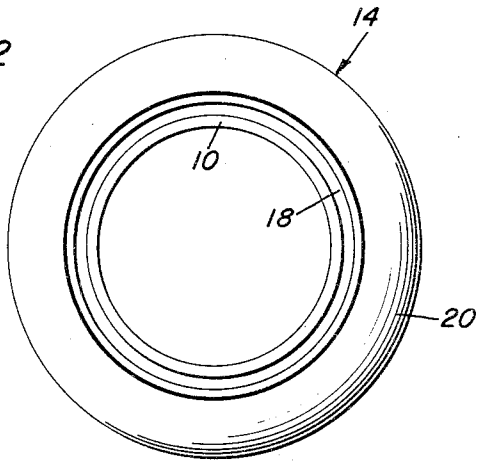
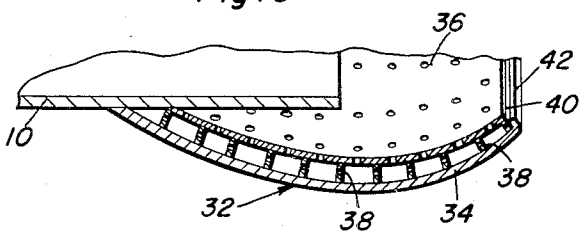


Fig. 3



Claud R. Killian
INVENTOR.

BY Clarence A. O'Brien and Harvey B. Jackson
Attorneys

United States Patent Office

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JET ENGINE SILENCER

Claud R. Killian, Hayesville, N.C.

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2 Claims. (Cl. 181—57)

This invention relates to devices for silencing internal combustion engines, and particularly to a silencer for a jet engine.

An object of this invention is to provide an engine silencer which is attached to the exhaust tube of a jet engine, the silencer being mounted in such a way that the exhaust gases pass through it, the silencer being essentially a low-pass acoustical filter.

A further object of this invention is to provide a silencer for a jet engine exhaust tube which forms very little back pressure in its silencing operation.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a fragmentary sectional view of a jet engine exhaust tube to which the silencer is attached;

Figure 2 is a rear view of Figure 1; and

Figure 3 is a fragmentary longitudinal sectional view showing a modification of the silencer.

In the drawings, there is a jet engine exhaust tube **10** at the discharge end **12** of which the silencer **14** is mounted. This silencer consists of a bulbous housing having an opening **16** at one end thereof into which the exhaust tube **10** is inserted. The opposite end of the bulbous member has a discharge opening **18** therein in registry with the discharge end of the exhaust tube **10** and slightly larger than the opening **12** thereof.

The bulbous member **14** is similar in appearance to a bell. However, the end portion **20** is flared smoothly inwardly instead of outwardly as in a bell. The inner surface **22** of the bulbous member has annular ribs or corrugations therein which constitute baffles **24**. The baffles are concentrically arranged along the longitudinal axis of the bulbous member, and when it is placed on the exhaust tube **10**, these corrugations are concentric with the longitudinal axis of the exhaust tube.

As the exhaust gases from a jet engine issue from the exhaust tube **10**, they spread gradually, as shown in Figure 1. The lip **26** of the bulbous member and located at the discharge opening **18** is located at the outer edge of the cone of issuing gases. Some of the gases are reflected toward the concentric line **28** extending parallel to the longitudinal axis of the exhaust tube **10** and the bulbuos member. Devious flow paths are formed in this way in order to form a muffling action. Additionally, the cavity formed by the bulbuos member over the outer surface of the exhaust tube **10** and the extension of the

outer surface of this tube **10** and the inner corrugated surface of the bulbous member produces considerable attenuation of sound waves above a cut-off frequency determined by the size of this cavity.

The jet engine exhaust tube **10** of Figure 3 is provided with a silencer **32** which has a hollow bulbous member **34** of a shape similar to the shape of member **20**. Instead of a series of ribs which constitute baffles **24**, Figure 3 has an apertured liner **36** together with a plurality of annular spacers **38** holding liner **36** spaced from the inner surface of member **34**. Spacers **38** are also apertured and with apertured liner **36** constitute sound and gas baffles.

Some circulation between member **34** and liner **36** is present during the use of silencer **32**. The gas is discharged through the aperture **40** around the lip **42** of the bulbous member **34**. Sound waves passing between the liner **36** and member **34** are silenced as they pass through the numerous apertures.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. In combination with a jet engine exhaust tube having a discharge end from which issues exhaust gases for propulsion, a silencer attached to said tube and comprising a bulbous housing having a wall provided with a front open end in which said tube is disposed, the forward end of said wall having an aperture, the inner surface of said housing being shallowly and transversely corrugated from said aperture which is upstream of the discharge end of said tube to the rear open end of said housing to provide baffles for reflecting sound waves, the discharge end of said exhaust tube being located in said housing intermediate the front and rear open ends thereof and at a relatively short distance from said discharge end of the housing, the portion of the exhaust tube which is in said housing being spaced from the wall of said housing to constitute a cavity which forms a low-pass acoustical filter for attenuating the sound waves.

2. The combination of claim 1 and the rear open end of said housing having an inwardly directed lip from which sound waves emanate.

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