

March 21, 1939.

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2,151,084

SILENCER

Filed April 7, 1937

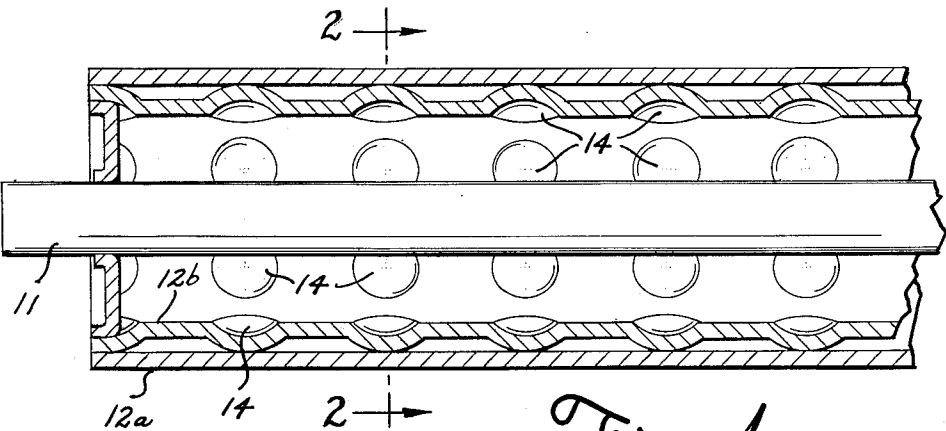


Fig. 1

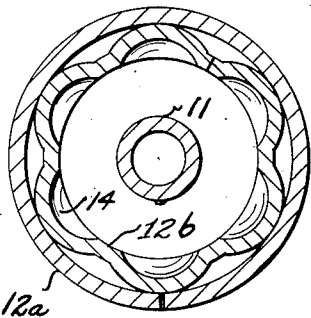


Fig. 2

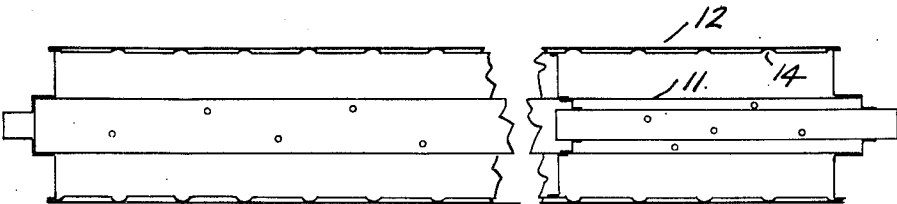


Fig. 3

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2,151,084

SILENCER

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Application April 7, 1937, Serial No. 135,600

1 Claim. (Cl. 181-62)

This application relates to silencers and particularly to silencers for exhaust gases of automobile engines.

One of the important problems in connection with the design and development of silencers is the problem of minimizing shell noises, which are noises produced by vibration of the outer shell of the silencer, such vibrations being produced by the impinging of sound waves against the shell. Various expedients have been adopted for the purposes of minimizing shell noises. One such expedient is the padding of the shell with asbestos padding or the like; another is the reinforcing of the shell by the provision of transverse supporting and bracing diaphragms. In this application I disclose an arrangement which has not only proven successful, insofar as minimizing shell noises is concerned, but has also proven more satisfactory than presently known expedients for the reason that it is an arrangement which is inexpensive to adopt and to utilize.

Briefly, it may be stated that my arrangement comprises the use of a multiply shell, with pressed-out spots provided in either one of the plies to engage the other and thus space the plies relatively and form an annular air space between them.

For an understanding of my arrangement reference should be had to the appended drawing showing a silencer provided with my arrangement. In this drawing,

Fig. 1 is a fragmentary sectional view of a silencer, with parts improperly proportioned for purposes of exaggeration in an effort to enhance the clarity of the disclosure;

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

Fig. 3 is a diagrammatic representation of a silencer as if provided with the construction of the invention.

Referring to Fig. 3 particularly, it will be seen that this figure shows a silencer of the through type having therein an inner tubular shell 11 and an outer tubular shell 12. It is understood that sound waves within the silencer impinge against the outer shell, causing vibrations thereof which in turn produce shell noises.

For the purposes of reducing such vibrations and noises of the outer shell, the outer shell of the silencer herein disclosed is arranged in accordance with my invention. Consequently it is formed of two plies 12a and 12b and the inner ply is provided with pressed-out spots 14 which

extend radially outwardly of the inner ply into engagement with the inner surface of the outer ply.

The spots are formed as "dimples" spot-pressed out of the metal of the inner ply, and in a preferred embodiment substantially the entire area of the inner ply is provided with these substantially uniformly spaced dimples.

It is not believed at present that the proportions and spacing of the dimples is of importance in connection with the invention. However, in order that a clear understanding of my invention may be obtained, I describe an embodiment which has been made and tested and found satisfactory insofar as shell noises are concerned and in which it appears that shell noises have been minimized greatly by the use of my invention. In this embodiment, the following dimensional characteristics existed; the shell was made approximately 6 inches in diameter and 17 inches long; the shell outer ply was made of sheet steel of .018 inch thickness, the shell inner ply was made of sheet steel of .018 inch thickness; the dimples were spot-pressed outwardly to the extent of .020 inch in radial projection and the air space between the inner and outer plies and between the spots was approximately .020 inch in thickness; the dimples were of .50 inch diameter and were spaced on 2.5 inch centers over the entire area of the ply.

The spots, by spacing the plies relatively, insured the provision of a dead air space between the plies, and manifestly succeeded in minimizing shell noises to a tremendous extent.

While the use of two plies for a silencer shell is not now broadly new, since I disclosed this idea in an earlier application, Serial No. 62,043, filed February 3, 1936, I claim as now new the use of two plies and the provision of spots in one of them for the purposes described.

Now having described the silencer herein disclosed, reference should be had to the claim which follows for a determination of the invention.

I claim:

In a silencer of the class described, a multiply sheet metal tubular shell inside of which are sound waves which impinge against the inner ply with the inner one of the plies having circular pressed out spots extending from it to the other to space the plies relatively and thus form an annular air space between the plies.

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