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SILENT EXHAUST BOX FOR INTERNAL COMBUSTION ENGINES.

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1,402,896. Patented Jan. 10, 1922.

Fig. 1.

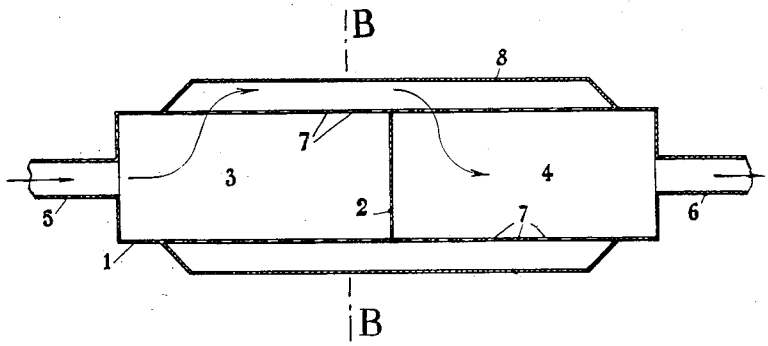
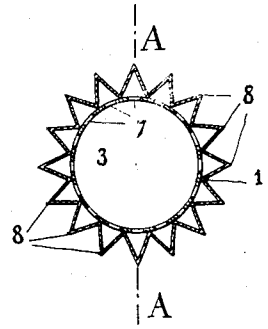


Fig. 2.



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SILENT EXHAUST BOX FOR INTERNAL-COMBUSTION ENGINES.

1,402,896. Specification of Letters Patent. Patented Jan. 10, 1922.

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To all whom it may concern:

Be it known that I, HUGO SCHNEEBELI, of 28 Rue de Bécon, Courbevoie, Seine, France, engineer, have invented a Silent Exhaust Box for Internal-Combustion Engines, (for which I have filed an application in France, May 22, 1919, Patent Number 522,976, dated April 11, 1921,) of which the following is a full, clear, and exact description.

This invention has for its object a silent exhaust box for internal combustion engines essentially characterized by the combination:

(*a*) of a first expansion chamber receiving the exhaust gases from the engine;

(*b*) of hollow gills independent from each other in which are cooled the expanded gases which are in thin streams after their passage through the first expansion chamber;

(*c*) of a second expansion chamber communicating with the first chamber through the hollow cooling gills.

The purpose of this general arrangement consists:

1°—in subjecting the gases escaping from the engine to a first expansion;

2°—in dividing the said gases into a plurality of thin streams;

3°—in cooling them which is facilitated by 2°;

4°—in dividing them again;

5°—in subjecting them finally to a new expansion before their escape in the atmosphere.

There is thus obtained, by these various successive operations, a complete deadening of the noise, without creating any back-pressure capable of diminishing the power of the engine.

A form of execution of an exhaust box made according to this invention is shown, by way of example only, in the accompanying drawing, in which:

Fig. 1 is a longitudinal vertical section made according to line A—A of Fig. 2.

Fig. 2 is a cross vertical section made according to line B—B of Fig. 1.

As illustrated in the drawing, this apparatus comprises a casing 1 of any circular or polygonal cross section and of suitable length, divided by a solid transverse wall 2 in two distinct expansion chambers 3 and 4.

The first expansion chamber 3 communicates with the exhaust of the engine through a conduit 5 and the second expansion chamber 4 is open to the atmosphere through an opening or conduit 6 of suitable cross section.

The wall 1 is perforated with openings 7 located opposite hollow gills 8 causing the expansion chambers 3 and 4 to communicate together and thus allowing the gases expanded in the first chamber 3 to be conveyed in the second expansion chamber 4.

These hollow gills which are of any cross section, but preferably of V-shaped, do not communicate with each other and constitute a radiator which is constantly subjected to the cooling action of the atmosphere.

This arrangement ensures the cooling of the expanded gases during their passage from the first expansion chamber to the second expansion chamber; the said gases are subjected to their travel: to a first division when they issue from the chamber 3 and when they pass through the openings 7 and to a second division when they enter the expansion chamber 4 by passing through the orifices 7 putting the hollow gills 8 in communication with the said chamber 4.

From the foregoing it will be understood that the above described apparatus as connected by means of the pipe 5 onto the exhaust conduit of an internal combustion engine, and the burnt gases from the latter enter through the said pipe into the first chamber 3 in which these gases expand for the first time.

They escape then through the orifices 7 provided in the casing 1 and enter, in a divided state, into the various hollow gills 8 in which they are subjected to a certain cooling.

From these gills, the gases expanded the first time, then divided and cooled, enter through the openings 7 of the rear part of the apparatus into the second chamber 4 in which a second expansion takes place before their final exhaust in the atmosphere into which these gases escape silently through the conduit 6, without producing within the apparatus any back pressure prejudicious to the working of the engine.

The above described apparatus diagrammatically illustrated in the drawing is, of course, given only by way of example and it is obvious that the forms, materials and dimensions thereof may be varied according to circumstances without departing thereby from the nature of the invention.

Having now particularly described and ascertained the nature of my invention and in

what manner the same is to be performed, I declare that what I claim is:—

1. A silent exhaust box for internal combustion engines comprising: a casing of any cross section,—a median wall dividing the casing in two distinct chambers,—an inlet for the first chamber and connected to the exhaust of the engine,—an outlet for the second chamber and open to the atmosphere,—a plurality of independent conduits connecting exteriorly the two chambers and communicating with the interior thereof by means of openings in their walls, said conduits being of small cross section and adapted to cool the gases therein.

2. A silent exhaust box for internal combustion engines comprising: an expansion chamber having perforated walls, said chamber being adapted to receive the exhaust gases from the engine, a second similar expansion chamber having an outlet to the atmosphere, a wall separating the two expansion chambers, and a series of external thin walled conduits extending longitudinally along the walls of both chambers, said conduits covering the perforations and having no direct communication with each other.

3. A silent exhaust box as in claim 2, in which the expansion chambers are cylindrical and arranged in series, and the external conduits are in the form of gills of V-shaped cross-section.

HUGO SCHNEEBELI.