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MEANS FOR SILENCING EXPLOSION NOISES CONNECTED WITH MOTOR CARS, MOTOR VEHICLES, CYCLE, GAS, OIL, AND STEAM ENGINES

Filed June 12, 1923

Fig. 1.

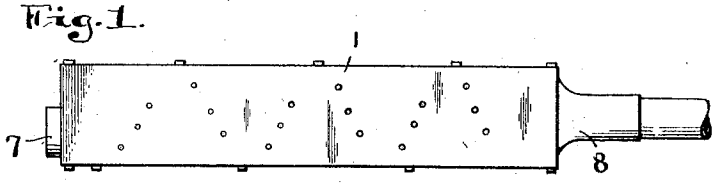


Fig. 2.

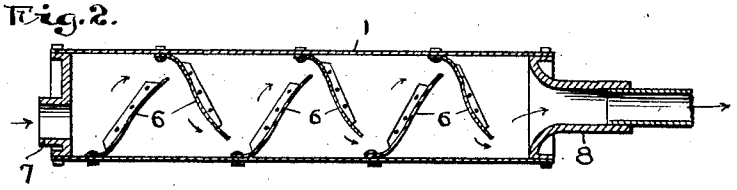


Fig. 3

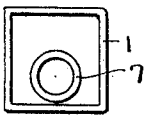


Fig. 4.

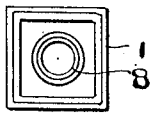


Fig. 5.



Fig. 6.



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UNITED STATES PATENT OFFICE.

FREDERICK HEATHER, OF KENILWORTH, NEAR CAPE TOWN, SOUTH AFRICA.

MEANS FOR SILENCING EXPLOSION NOISES CONNECTED WITH MOTOR CARS, MOTOR VEHICLES; CYCLE, GAS, OIL, AND STEAM ENGINES.

Application filed June 12, 1923. Serial No. 645,003.

To all whom it may concern:

Be it known that FREDERICK HEATHER, a subject of the King of England, residing at Kenilworth, near Cape Town, Cape of Good Hope, Union of South Africa, has invented certain new and useful Improvements in Means for Silencing Explosion Noises Connected with Motor Cars, Motor Vehicles; Cycle, Gas, Oil, and Steam Engines, of which the following is a specification.

This invention relates to internal combustion and other heat engines and more particularly to devices for reducing the sound of the exhaust gases or vapours expelled from the engine cylinders. The exhaust gases leave the cylinders at comparatively high temperatures and possess great expansive properties. One object of the present invention is to provide means for allowing the exhaust gases to expand gradually so as to minimize the noise. Another object of the invention is to provide an arrangement whereby the exhaust gases escape easily without meeting any resistance which would cause a back pressure in the cylinder.

According to the invention, the device comprises a box divided into chambers by means of guide plates secured alternatively to opposite sides of the box, communication between consecutive chambers being established by openings between the free ends of the said guide plates and the sides of the box. Adjacent guide plates may be relatively placed by a variable angle, so as to vary the volume and shape of each or any chamber. The gases enter the first chamber from the engine exhaust pipe and expand through the various chambers to the end of the containing box where a large outlet is provided.

In order that the invention may be more clearly understood and readily carried into effect, reference is made, by way of example, to the accompanying drawings, in which:—

Fig. 1 is an outside view of a device constructed in accordance with the invention,

Fig. 2 is a sectional view of the device shown in Fig. 1 taken through the centre line of the same.

Fig. 3 is an elevation of the inlet end,

Fig. 4 is an elevation of the outlet end, and

Figs. 5 and 6 are elevations of alternative forms of plates 6.

Referring to the figures (1) is a metal box which may be of rectangular or other suitable shape, it has cast iron or other suitable metal end portions 7 and 8 securely fixed by means of bolts or other effective methods, the exit end 8 being preferably cone shaped. Guide plates 6, Fig. 2 are riveted or bolted to opposite sides of the box 1 and may have raised flutes on one side of their faces with a corresponding depression on the other. The plates 6 may be of curved form as 6, Fig. 2, or scooped as Fig. 6 or straight as Fig. 5, and are free from sharp edges. Consecutive plates are angularly placed in relation to each other so as to form a series of chambers. The volume of each or any of the chambers may be varied by altering the angles of inclination of the guide plates 6 Fig. 2.

The exhaust gases enter the first chamber through the inlet end 7, expand, and pass through a large opening between the free end of the first plate 6 and the top of the containing box 1, into the second chamber. The gases then expand and pass through a second opening, between the free end of the second plate and the bottom of the box 1 into a third chamber and so on, the gases expanding alternately and passing through openings in the top and bottom of the box 1.

A large cast metal cone shaped end 8, to which a bent or straight tail pipe may be attached, is provided in the last chamber, the object of the tail pipe being to further minimize noise and to conduct the exhaust gases away. The number and size of the chambers may be varied according to the horse-power of the engine.

By allowing the exhaust gases to expand through a series of chambers as hereinbefore described, the gases leave the box 1 freely and quietly, without encountering any resistance in their path. The openings in the chambers are large enough to allow the

gases to readily pass from chamber to chamber, and each opening is preferably of an area more than twice that of the engine exhaust pipe. By this construction, back pressure to the engine is avoided so that no resistance is offered to the discharge of exhaust gases from the engine cylinder.

The box 1 may be enclosed in a metal case with any suitable non-inflammable material packed between the two casings in order to further reduce the noise.

The device may be used on motor-cars, motor-cycles, and the like or on any form of gas, oil, or steam engine.

In connection with the foregoing it is respectfully pointed out that inasmuch as the baffle plates 6 are reversely curved and are secured alternately to the bottom and top of the casing dividing the same into communicative expansion chambers that the outer curved end of each baffle plate projects slightly over and in closely spaced relation to the curved inner attaching portion of the adjacent plate so as to provide a symmetrical wave-like course for the gases as they pass through the successive communicative chambers.

Having thus fully described the invention what is claimed as new and desired to be secured by Letters Patent is:—

1. A silencer for internal combustion engines including a hollow casing rectangular in cross-section having an inlet at one end and an outlet at the other end, a plurality of oppositely curved baffle plates secured alternately to the bottom and top of the casing throughout the length thereof and dividing the casing into communicative expansion chambers, the outer curved end of each baffle plate projecting slightly over and in closely spaced relation to the curved inner attaching portion of the adjacent plate so as to also provide a symmetrical wave-like course for the gases as they pass through the successive chambers.

2. A silencer for internal combustion engines as claimed in claim 1 wherein flanges are formed on the respective side edges of the baffle plates and fastened to the opposite side walls of the casing.

In testimony whereof I affix my signature in the presence of two witnesses.

FREDERICK HEATHER.

Witnesses:

H. R. ARDERNE,

V. BROWN.