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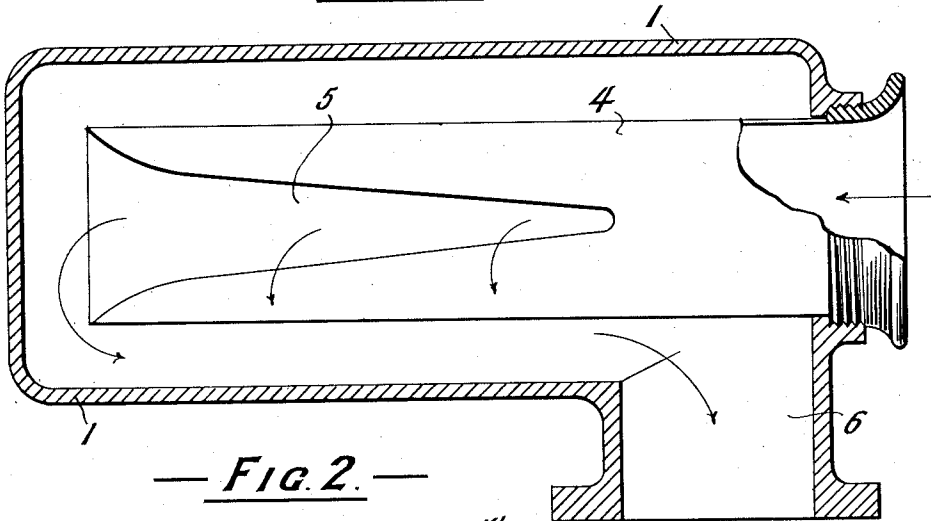
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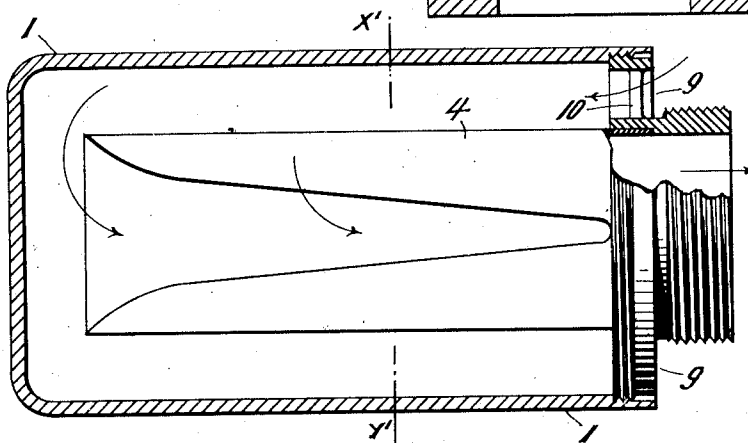
INTAKE SILENCER FOR INTERNAL COMBUSTION ENGINES

Original Filed May 6, 1921

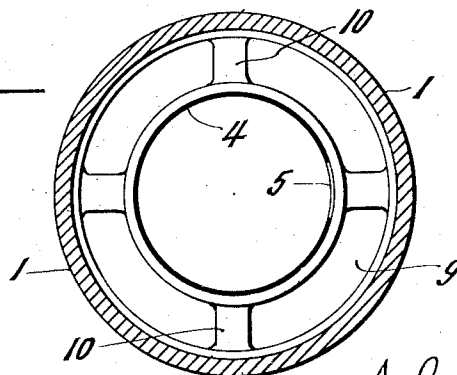
— *Fig. 1.* —



— *Fig. 2.* —



— *Fig. 3.* —



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Inventor
By *[Signature]*
Attorney

UNITED STATES PATENT OFFICE.

JOHN REED, OF CORBRIDGE-ON-TYNE, ENGLAND.

INTAKE SILENCER FOR INTERNAL-COMBUSTION ENGINES.

Original application filed May 6, 1921, Serial No. 467,484. Divided and this application filed November 21, 1922. Serial No. 602,418.

To all whom it may concern:

Be it known that I, JOHN REED, a subject of the King of Great Britain, residing at Corbridge House, Corbridge-on-Tyne, Northumberland, England, have invented certain new and useful Improvements in Intake Silencers for Internal-Combustion Engines, of which the following is a specification.

10 The present invention is a division of my patent application Serial No. 467484 filed 6th May, 1921, relating to silencing devices for rapidly flowing gases.

The object of the present invention is to provide an improved silencing device of simple construction whereby noises caused by gases or air entering a chamber will be entirely obviated or so much minimized as to be negligible. The silencing device according to this invention and as hereafter described is particularly applicable for use with internal combustion engines, and may be connected, for instance, to the carburettor of an internal combustion engine for the purpose of preventing the hissing noise caused by the inflowing air thereto.

According to this invention an elongated outer casing of substantially equal diameter throughout its length is constructed having an open-ended tube entering at one end and extending to near the opposite closed end of the outer casing, the said open-ended tube having series of holes formed in its wall within the casing, the holes towards the inner end of the tube being larger in area than the holes towards the entering end of the tube; or alternatively the tube within the casing may be formed with a slot or slots which increase in area as they approach the inner end of the said tube. The outer casing is formed with an opening or provided with a tube communicating with the outer casing adjacent to the entrance end of the aforesaid open-ended tube having the slots or holes.

In the apparatus above generally outlined according to the present invention, when entering gases are being dealt with, as for instance when dealing with air passing into a carburettor, the air may enter through the exterior open end of the tube having the graduated apertures or slots and pass to the carburettor by the opening or pipe extending from the outer casing, or the course may be reversed, that is the air may

enter the outer casing through the opening or pipe communicating therewith and may pass to the carburettor through the tube having the graduated apertures or slots.

The invention will be further described with reference to the examples of construction shown on the accompanying drawings.

Fig. 1 is a longitudinal sectional elevation of the silencer according to this invention suitable for silencing the passage of air to the carburettors of internal combustion engines. Fig. 2 is a longitudinal sectional elevation, and Fig. 3 is a vertical cross section on the line X¹—Y¹ of Fig. 2 looking to the right, illustrating an example wherein the passage of the air current is reversed, that is the air passes into the outer casing through an aperture and finds its exit therefrom to the carburettor by the open-ended tube having the graduated slot or perforations.

The silencer in accordance with this invention as shown at Fig. 1 is designed for use in conjunction with the carburettor of an internal combustion engine, the closed casing 1 being cylindrical in shape and formed with an outlet pipe 6 near one end suitable for connection with the carburettor of the engine.

Through an opening in one end of the cylindrical chamber 1 and adjacent to the outlet pipe 6, a tube 4 is inserted. This tube 4, which is open at both ends, extends within the casing 1 to within a short distance of the opposite end of the casing and forms the inlet for air passing to the carburettor. The wall of this tube 4 within the casing is formed with a slot 5 extending from its inner open end for a portion of its length, the said slot increasing in area as it approaches the said inner open end, and the outer end of the said tube outside the casing 1 is formed with a bell mouth.

The air enters the casing through the bell mouth of the slotted tube and finds its way partly through the graduated slot (or it may be series of holes) and partly through the open inner end of the tube 4 to the outlet pipe 6 which is connected to the carburettor. The entering air in passing down the slotted tube 4 will pass through the slot 5 therein in gradually increasing quantities and through the end of the said tube 4 to the carburettor.

The sound vibrations reaching the outer

air, travel in the reverse direction to the entering air. As each vibration enters the silencer from the carburettor it travels down the casing 1 of the silencer and as it does so it gradually escapes into the slotted tube 4 through the open slot 5 until it reaches the inner open end of the tube 4 when the remainder escapes through said tube 4 to the outer air. It will be seen that part of the vibration escapes immediately to the open air through the small end of the slot 5 whilst the remainder has to travel varying distances up to twice the length of the slot 5 before escaping, that is once up inside the casing to the end of the slot and back inside the inner tube. The vibrations are therefore spread out over a long period of time and thus noise is prevented. The frequency of the vibrations is very great, but by this invention with quite a short silencer it is possible to extend the time of each vibration until it overlaps the succeeding one and thus obtain almost absolute silence.

Obviously the gases passing to the engine by way of the device, may be caused to pass in the direction described or in the opposite direction if desired.

To suit certain conditions and as shown at Figs. 2 and 3 a modified construction of the silencer may be desirable consisting of a cylindrical casing 1 open at one end 9 and closed at the other. A tube 4 extends within the said casing 1 supported by radial arms 10 Fig. 3, within the open end of the casing 1, the outer end of the said tube 4 being connected to the air inlet of the carburettor of the engine. The inwardly projecting tube 4 is slotted or perforated as before described.

With this construction air will enter the open end 9 of the casing 1 between the radial arms 10 supporting the inner slotted or perforated tube 4 and find its way to the carburettor, entering partly through the slots or perforations 5 and partly through the inner open end of the said tube 4.

The silencing action is the same as in the previous example.

What I claim as my invention and desire to secure by Letters Patent is:

1. In a device for silencing rapidly flow-

ing gases entering an internal combustion engine, an elongated outer casing of substantially uniform diameter throughout its length, one end of which casing is closed and the other end in communication with the induction pipe of the engine, in combination with a tube traversing nearly the whole length of said casing, said tube being at one end open to the atmosphere and at the other end open to the interior of said casing adjacent the closed end thereof, and said tube being formed with a slot, which slot increases in width as it approaches the inner end of said tube.

2. In a device for silencing rapidly flowing gases entering an internal combustion engine, an elongated cylindrical outer casing of substantially uniform diameter throughout its length, one end of which casing is closed and the other end in communication with the induction pipe of the engine, in combination with a tube traversing nearly the whole length of said casing, said tube being at one end open to the atmosphere and at the other end open to the interior of said casing adjacent the closed end thereof, and said tube being formed with a slot, which slot increases in width as it approaches the inner end of said tube.

3. In a device for silencing rapidly flowing gases entering an internal combustion engine, an elongated outer casing of substantially uniform diameter throughout its length, one end of which casing is closed and the other end in communication with the induction pipe of the engine, in combination with a tube traversing nearly the whole length of said casing, said tube being at one end bell-mouthed and open to the atmosphere and at the other end open to the interior of said casing adjacent the closed end thereof, and said tube being formed with a slot, which slot increases in width as it approaches the inner end of said tube.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

JOHN REED.

Witnesses:

FEARLEE WINSHIP,

Cissy NICOLSON.