A. CASTETS.

APPARATUS FOR DEADENING THE NOISE MADE BY THE EXHAUST GASES ESCAPING FROM INTERNAL COMBUSTION ENGINES INTO THE OPEN AIR.

APPLICATION FILED DEC. 22, 1919.

1,356,189. Patented Oct. 19, 1920.

Fig. 3

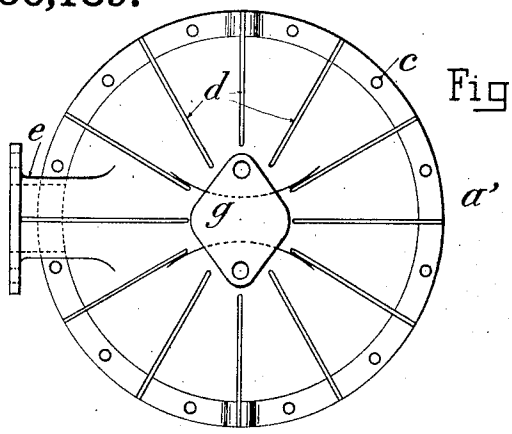


Fig. 1

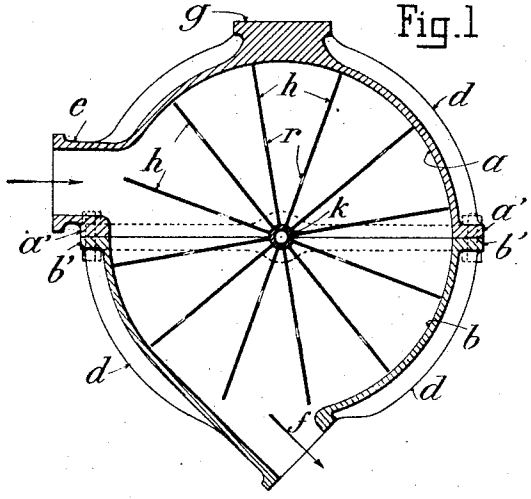


Fig. 2

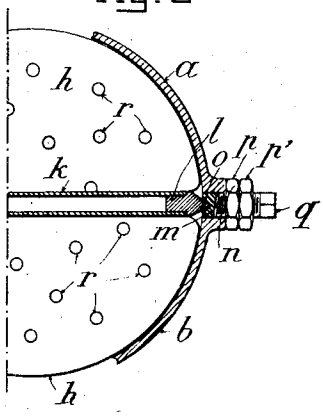
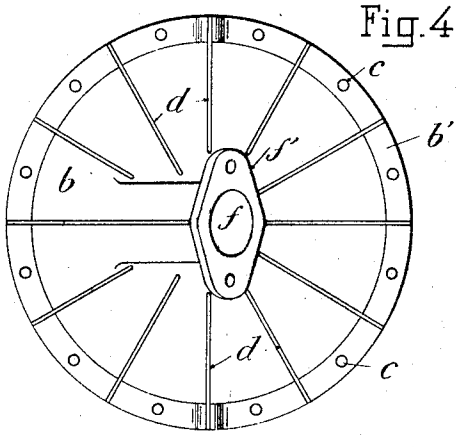


Fig. 4



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APPARATUS FOR DEADENING THE NOISE MADE BY THE EXHAUST-GASES ESCAPING FROM INTERNAL-COMBUSTION ENGINES INTO THE OPEN AIR.

1,356,189. Specification of Letters Patent. Patented Oct. 19, 1920.

Application filed December 22, 1919. Serial No. 346,718.

To all whom it may concern:

Be it known that I, ANDRÉ CASTETS, citizen of the French Republic, residing at Gaillères, Landes, France, have invented new and useful Improvements in Apparatus for Deadening the Noise Made by the Exhaust-Gases Escaping from Internal-Combustion Engines into the Open Air, of which the following is a specification.

The object of this invention is an apparatus which renders inaudible the noise made by the exhaust gases escaping from internal combustion engines into the open air. Said deadening apparatus, compared with the appliances at present in existence, offers the advantage of avoiding compression in the explosion chamber or chambers, cooling the exhaust gases and consequently contracting the gaseous mass before the same is allowed to escape into the open air.

Said deadening apparatus can be applied indifferently to stationary, motor car, motorcycle, boat, waterplane, aeroplane, dirigible airship engines, etc.

Said deadening apparatus consists of a thin spherical metal chamber formed by two hemispherical heads connected together by means of flanges, the outer face of said heads being provided with ribs which contribute to increase the strength and favor the cooling and thus determine the contraction of the gaseous mass which passes through said spherical chamber before escaping into the open air. In said spherical chamber there freely revolves a radial ribbed drum which is driven by the pressure of the exhaust gases; the rotation speed of said drum automatically increases proportionately to the speed of the engine to which the deadening apparatus is connected.

The drawing annexed hereto shows one mode of realization of said deadening apparatus.

Figure 1 gives a cross axial section through the center of the exhaust gas inlet and outlet pipe connections.

Fig. 2 is a cross section of a portion of said apparatus taken perpendicularly to that in Fig. 1 and shows the arrangement of the rotation axis of the ribbed drum and also said drum.

Figs. 3 and 4 are respectively external views of the upper and lower heads which form the deadening apparatus.

Said spherical deadening apparatus is formed by two hemispherical thin metal heads *a* and *b*, in aluminium for instance, each being provided with a flange *a'* and *b'*; said flanges have holes *c* drilled in them and through which pass connecting bolts.

Said heads are provided externally with radial ribs *d* which increase their strength and favor the cooling of the heads and consequently the cooling of the gases which pass through the deadening apparatus.

The upper head *a* is provided with a pipe connection *e* which is of normal design on the side of the head and allows the exhaust gases to enter into the apparatus. The lower head *b* is provided with a tangential pipe connection *f* which allows the exhaust gases to escape into the open air; the latter pipe connection is provided with a flange *f'*, the latter being drilled with holes for firmly fastening the apparatus close to the engine. The upper head *a* comprises a plane portion *g* through which there are holes *g'* drilled for the purpose of fastening the apparatus near the engine with which it is to be connected.

Inside the sphere which is formed by the airtight fastening of both said heads *a* and *b* there freely revolves a metal drum provided with radial ribs *h* the hollow spindle *k* of which is provided at each end with a point *l* made of hard steel for instance. Said points *l* revolve each on a bearing *m* of ruby or hard metal which is set or otherwise fixed at the end of a threaded rod *n* screwing into a thread hole *o* provided in the flanges *a'* and *b'*, opposite the center of the sphere. Said rod is fixed in its place only by means of a nut and lock nut *p* and *p'*. In order to adjust any play which may affect points *l* through wear, it suffices to screw up the threaded rods *n* by means of a spanner fitting the square head *q* provided at the outer end of said rods. This arrangement permits to obviate the necessity of lubricating the points of spindle *k*.

Ribs *h* which are twelve in number for instance are if required drilled with holes *r* in order to facilitate the mixing of the gases as they go through the spherical chamber in the direction shown by the arrows.

The inlet pipe connections *e* might be placed at any other point of upper head *a* and directed tangentially to the side thereof.

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

1. An apparatus deadening the noise made by the exhaust gases escaping from internal combustion engines into the open air, consisting, on the one hand, of a hollow metal sphere constituted by two hemispherical heads each of which is provided with a flange for connecting it with the other one so as to form an airtight sphere, one of these heads being fitted with a connection pipe placed normally in relation to its wall which allows the exhaust gases to enter into the sphere, while the other head is provided with a tangential connection pipe which allows the exhaust gases to escape into the open air, after having gone through the sphere, and, on the other hand, of a drum formed with radial ribs fixed on a hollow axis, the latter being pivoted on the same level as the flanges so as to allow the said drum to rotate under the impulsion of the exhaust gases penetrating into the sphere.

2. In an apparatus deadening the noise made by the exhaust gases escaping from internal combustion engines into the open air, consisting of a hollow metal sphere constituted by two hemispherical heads, each of which is provided with a flange for connecting it with the other one so as to form an airtight sphere, one of the heads having a connection pipe placed normally in relation to its wall on the same level as its fastening flange while the other head is provided with a tangential connection pipe which allows the exhaust gases to escape into the open air, the arrangement of radial ribs on the external wall of each head, the said ribs acting to favor the cooling of the said heads and consequently the cooling of the gases that go through the sphere, the arrangement within the inside of the sphere of a drum formed with radial ribs either drilled or not drilled with holes and fixed on a hollow axis, each of the ends of the said axis being fitted with a sharp point supported by a distinct bearing placed on the same level as the flanges connecting the two heads, the arrangement of each bearing at the end of a threaded rod which is allowed to rotate in a threaded hole formed in the flanges, these threaded rods causing the said bearings to move toward the center of the sphere to be able to remedy at the required moment the wear of the sharp points constituting the ends of the axis of the drum.

In testimony whereof I have signed my name to this specification.

ANDRÉ CASTETS.